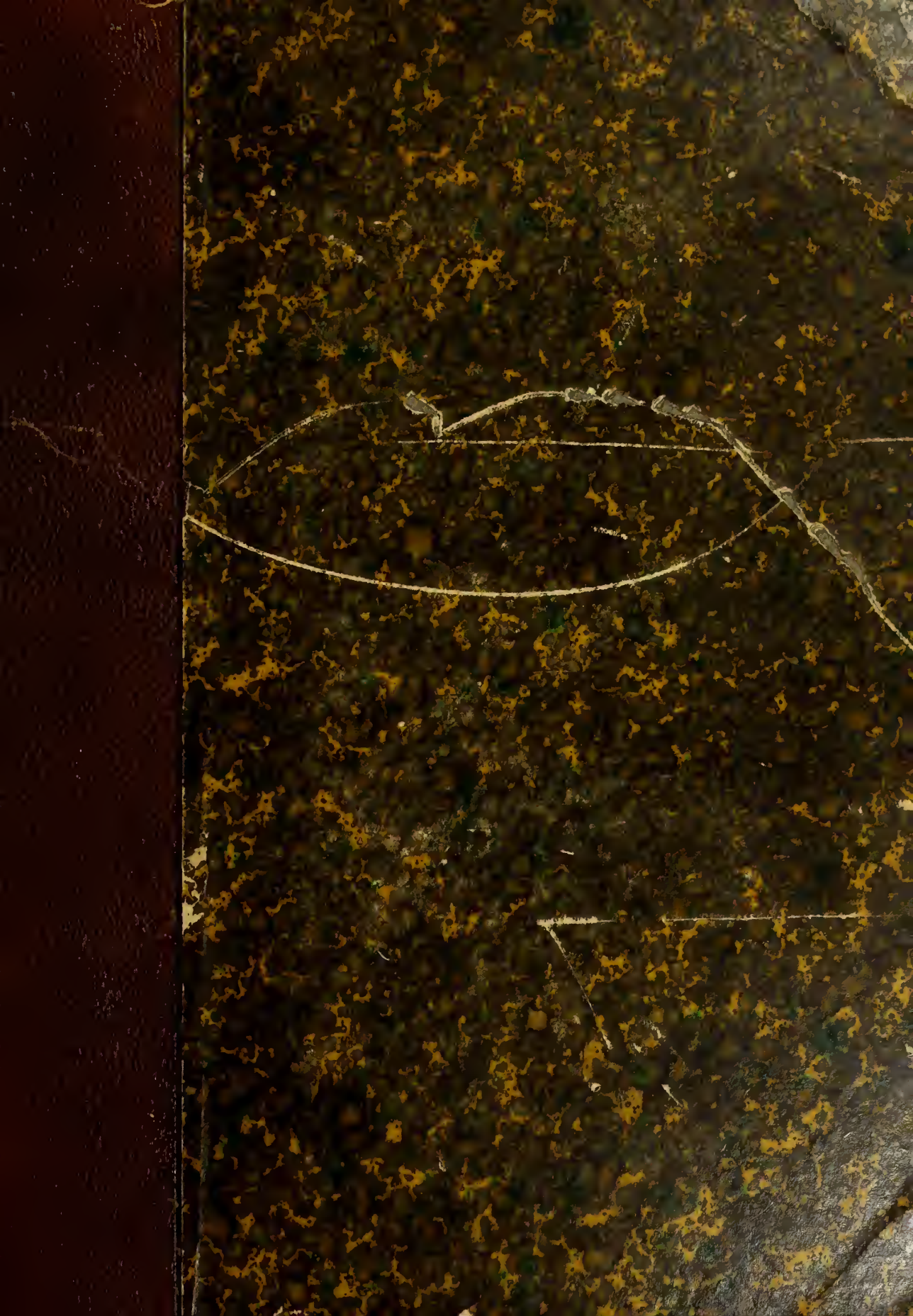

NATAL DEPARTMENT OF AGRICULTURE AND MINES.

VOLUME IV.

MARCH, 1901—MARCH, 1902.

The Agricultural Journal

AND MINING RECORD.

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INDEX.

VOLUME IV.

AGRICULTURE.

CATTLE.

CORRESPONDENCE.

DAIRY.

ENTOMOLOGY.

FISH.

FORESTRY.

FRUIT CULTURE.

HORSES.

INTERVIEWS.

MISCELLANEOUS.

POULTRY, ETC.

PIGS.

SHEEP.

VETERINARY.

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The Agricultural Journal

AND MINING RECORD.

VOL. IV. FRIDAY, MARCH 15, 1901. No. 1.

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CONTENTS.

Volume IV.

THE *Journal* to-day enters upon its fourth year of existence. Owing to the invasion of the northern parts of the colony, and the absence at the front of many members of the Department, the issues of several months of the last year were lacking in matter of local origin. The Editor takes this opportunity of thanking all who in any way have contributed to the interest and information the columns of the *Journal* are intended to afford.

Quarter-evil Vaccine.

BY H. WATKINS-PITCHFORD, F.R.C.V.S.

THE increased demand for this preparation within the last few weeks tends to show the intimate connection between the disease quarter-evil and the rainfall. Although one finds cases of the disease occurring throughout the year—even in the height of winter during the continuance of low temperatures and absence of moisture—there can be no doubt that, as with many diseases, the number of cases of quarter-evil largely increase as the veld becomes saturated with moisture

and as the level of the subsoil water tends to rise. This is what one would expect from even a rudimentary knowledge of micro-biology. Desiccation or dryness is a foe to all bacterial growths—a fact to be kept in mind in suppressing all forms of disease known to be of microbic origin.

Within the last twelve months 7,000 doses of the vaccine for the prevention of this disease have been issued from the Laboratory, a satisfactory output when the disturbed state of the colony is taken into consideration, and how greatly stock farming has been hindered or prevented in the northern parts. The almost complete success which has attended the issue of this preparation, and the undoubted immunity which its use confers upon young stock, renders the fact the more strange that many farmers are still unacquainted with the preventive value of the inoculation for quarter-evil. Only a few weeks ago I heard of a farmer describing in public a fatal form of disease which annually swept off numbers of his own and his neighbours' young stock. Upon enquiry an intelligent bystander elicited the fact that the disease in question was simply quarter-evil. Unrecognised as such, the disease had resulted in the deaths of scores of calves which might have defied the disease and attained a profitable maturity had the appropriate measures been adopted. The present fall of the year threatens to be a bad season for quarter-evil. It will be advisable therefore, especially upon farms which have an unfavourable reputation as regards this disease, for owners to re-inoculate all young stock at once. The remedy is simple, and the policy of waiting until the disease actually breaks out and necessitates repressive measures is not one that recommends itself to the careful stock-raiser. Prevention is better than check, particularly at a time such as the present, when calves are at an enhanced value.

Winter Turf Oats.

FOR SALE.

THE Winter Turf Oats ordered by the Department have now arrived, and are on sale at 25s. per 100 lbs. Applications should be directed to the Commissioner of Agriculture.

The following description of these oats is taken from *The Mayflower*:—Two years ago Col. L. D. Stockton ordered, through me, from Floral Park, seed of the Winter Turf Oat. His object was to introduce it into Kentucky, believing it to be the best kind for this part of the country. Results show that he was not mistaken in this opinion. The oat proved a wonderful success, surprising everyone with its great productiveness and fine winter pasturage. It is fast growing into favour, and promises to soon take the place here of all other oats.

Col. Stockton fairly tested the oats at Kylewood, and I note results, thinking that perhaps some of the readers of *The Mayflower*, or their friends, might be interested in it. The Turf Oats were sown at Kylewood in September and October, like wheat, from one and a half to two bushels to the acre. It germinates quickly, and is of rapid growth, furnishing pasture in six weeks after sowing, which will last until spring. It grows better in rich bottom land, but will treble wheat in any soil. It out-yields any small grain even in poor soil. In rich sod land it will produce an incredible amount. It stands the winter's cold equally as well as wheat or rye. It is white in colour, and firm and solid in grain. Grows tall like rye, and is not easily blown down by wind The heads are very long, sometimes two feet in length, one seed throwing up over one hundred straws, all bearing large plump heads of grain. It is cut just before wheat. If pasturage is not desired one bushel of oats to the acre is sufficient.

At Kylewood last winter, on twenty acres of the oats pasture, eighty-nine head of cattle, weighing one thousand pounds each, was pastured. They often subsisted on the oats alone for two weeks at a time. When the field was afterwards cut the average was forty bushels of oats to the

acre. Two acres that were not pastured yielded one hundred and one bushels—weight per bushel forty-two pounds.

A hardy, robust winter oat for fall sowing is, as the introducer claims, a novelty worthy the attention of every farmer in the land. Its enormous productiveness may be easily understood when it is stated that as many as 150 strong stems have been counted growing from one stool, and bearing 6,342 grains, all from one seed.

K. WOOD, KY.

The Hon. F. R. Moor in Australia.

A SPLENDID PASTURE GRASS.

ON Friday last, the Hon. F. R. Moor returned to the Colony from Australia. Mr. Moor, it will be remembered, went to Melbourne as a representative of the Colony to assist at the celebration of the festivities in connection with the inauguration of the Federal Government of Australasia. The hon. gentleman visited the different colonies of the continent, one of his chief objects being that of collecting information which might be of service to Natal colonists engaged in agriculture. The results of his observations he will communicate, from time to time, to the *Journal*. The first of the subjects dealt with is the

PASPALUM GRASS.

This grass which originally came from South America, and is scientifically known as *paspalum dilitatum*, is attracting attention throughout every part of Australia—in the rain belts and the drought belts, and in the hottest and the coldest districts *paspalum* is thriving.

"All my enquiries, and all my personal observations," said Mr. Moor, "go to show that *paspalum* will be one of the best grasses for Natal farmers to try. The grass has a broad leaf, it attains a length of about two feet, it is rank in growth, and anyone only looking at it would come to the opinion that it is altogether too coarse for the pasturing of stock. On handling it, however, that opinion would be changed. To the touch it is soft as velvet, and on the ground it lies thickly matted.

"In New South Wales, it is being very extensively grown. At the Hawkesbury Agricultural College of that colony I saw a field of it. The soil was poor and shallow—ironstone and gravel over white pipeclay. It had been planted some eight months, and was doing well. Already it had been grazed by sheep, and it was rapidly making big growth. The head of the college told me that it was very popular among farmers, and that its cultivation was spreading in every direction. He also assured me that it did not suffer in any way from cold, and that it was one of the best drought-resisting grasses known in Australia. In the back country, well up the mountains, where the cold is intense in winter, he also informed me the *paspalum* was doing well.

"In Queensland, at Brisbane, I saw a plant of the grass in the Acclimatisation Gardens surrounded by exotic grasses. At the time of my visit the country was suffering from the severest drought ever known. The *paspalum* was making good growth, while the surrounding grasses were either dying or dead. At the Gatton Agricultural College in the same colony I also saw it. The soil here, unlike that of Hawksbury, N.S.W., was rich alluvial, and the growth was magnificent.

"In getting the grass started there is some difficulty, as many of the seeds prove infertile. The most successful method is that of laying out small plots and by dividing or separating the roots, transplanting therefrom. The planting is done in rows three feet apart, and the plants two feet apart, or preferably, in the opinion of some, three feet apart.

"The seed should be sown during first spring rains. When one paddock has been grazed down, the stock are removed to another.

"I could not get any of the seed of this year's crop before leaving, all available up to that time having been bespoken, but I have made arrangements for a considerable quantity to be sent shortly to the Agricultural Department here for distribution.

"I would suggest the publication of an article which was contributed by Mr. S. M. Williams to the New South Wales *Agricultural Gazette*. All my enquiries, and all my personal observation, bear out what the writer says."

The following is the article referred to by Mr. Moor :—

"PASPALUM DILATATUM."

This grass, introduced into the Richmond River district about six years ago (or in 1892), was quite a new thing, and nobody knew anything as to its grazing qualifications, or as to its suitability for permanent pastures, or of its value as a food for stock. It consequently made slow headway, for farmers generally are averse to trying anything new. Only a few had the temerity to experiment in anything like a practical way, the rest waiting to see how it would turn out. Fortunately for me I was one of the few, and being pleased with the appearance, texture, and rapid growth, and noticing the avidity with which stock ate it, I determined to give this grass a fair trial. Four years ago I sowed my first seed, and also planted a few thousand roots to form a seed-bed. My farm is now practically soled with *paspalum*, and the more I see of it the better I like it. Of course I mix other grasses and clovers as a change for the stock, but *paspalum* is the basis of the pasture ; it has proved itself a mainstay for the stock, growing vigorously when the fierce heat had withered up the other grasses. I have carefully observed it in all its stages and variations, and have now come to the conclusion that *paspalum dilatatum* is the very best grass for the farmer to rely upon as a permanent pasture. I say permanent advisedly, for after four years grazing the paddocks are still improving and giving an increased quantity of feed. It is with me carrying a beast to the acre all the year round, and yet, during the season, I have in rotation been able to shut up every paddock, allowing the grass to grow and shed its seed. By this method a perfect turf can be obtained ; it does not spread from the roots and joints like some of the other *paspalum* grasses, of which there are a great variety. It stands any amount of grazing, and the trampling of stock does not injure it. In this district it grows nearly all the year round, but naturally a little slower during July, August, and September. It stands drought well, the frosts do not kill it, and I have even cut it down and run a fire over it, and after this severe treatment it grew as vigorously as ever. There is nothing hard or wiry about this grass ; it is soft and succulent, and there is no part of it from the crown to the seed-heads that the stock will not eat. My observation of grasses has extended over many countries as well as over most of the Australasian Colonies, but I have never met with any grass for general purposes which would equal *paspalum dilatatum*.

I have no knowlenge as to its value for sheep, but all other animals are fond of it, and keep up good condition. Its qualities for dairying purposes are undoubted, and every cow is kept in such condition as to enable her to give her standard of quality in the milk produced. My average test at the milk-separating station is among the very highest, ranging from 3·6 to 4·3 for butter fat. A more reliable test, however, may be found by referring to the *Agricultural Gazette* for May, 1896, page 328, where Mr. F. B. Guthrie has given the analysis of *paspalum* hay. In the *Agricultural Gazette* for August, 1896, Mr. G. M. M'Keown reported on several of the grasses he had experimented with, and it is interesting (page 530) to read what he says of *paspalum dilatatum* as regards the vast volume of green feed to be obtained per acre.

In connection with the germination of the seed, and the ripening of the seed-heads, certain peculiarities will be noted. The seed, if sown under favourable conditions, takes from eighteen to twenty-one days before it will appear to have germinated, and during that time it requires both moisture and heat, even then it does not all come up at the one time,

but plants may soon be noticed at all stages of growth from three inches high to those just breaking ground; the reason for this is, I think, that the earliest matured seeds germinate earlier than those which ripen on the same head a little later. Sown under unfavourable conditions, I have known the seed remain dormant in the ground for ten months, and then suddenly grow. I expect, however, a good many of the best seeds had been destroyed by insects during such a long period. It is therefore, no use to sow the seeds at improper times if good results are required. In the Richmond River District I have found the proper times to sow are — middle of July to middle of September, first week in December to first week in February. In the former it catches our spring rains, and in the latter our summer rains—both accompanied by heat, which appears very necessary. The quantity of seed to sow per acre varies with the requirements—5 to 8lbs. per acre on well-prepared ground will soon result in a good paddock. It 1½ to 2lbs. per acre are sown after grazing, it should be held up about September, and allowed to grow and shed all its seed naturally. It will soon spring up and the young grass, if anything like a favourable season takes place, will be fit to graze in May. I consider that allowing the grass to shed its seed naturally is the very best and surest method of thoroughly establishing the pasture.

A striking peculiarity will be noticed in the ripening of the seed. A vast quantity of seed is thrown up, and from appearances one would rely upon obtaining 4 or 5 cwt. of seed per acre—the seed, however, on each head does not ripen simultaneously, first a few grains mature and fall out, then others, and so on for two or three weeks, till all the fertile seeds have been shed; still a lot of seed-sacs will be left, but they are quite empty; the quantity of seed, therefore, of first-class quality which can be saved is exceedingly small compared with the apparent crop As soon as the stalks begin to bend over and attain a light greenish straw-colour is the time to commence picking; deal very gently with it or you will lose the best of the seed. The heads should then be taken into a barn and well shaken; this shaking may be repeated two or three times next day, by which time all the matured seed will be obtained. In leaving the heads in heaps, be very careful not to allow them to heat, or the seed would all be spoiled. The heads may now for a day or two be turned and threshed, and although the quality of the seed obtained by this second manipulation is very inferior, still a percentage of it will germinate; it may be used, therefore, for scattering thickly over rough ground.

If weather for picking is not good exactly when it should be commenced, and the crop allowed to get a little too ripe, a good first-quality seed can still be obtained, but the sample would be spoiled in appearance by a lot of straw-coloured empty seed-sacs.

A good many people in other districts have found a difficulty in getting the seed to germinate. In my opinion this has been due to their sowing at the wrong time of the year, and in some cases where very unfavourable seasons, droughts, etc., have occurred after sowing. Never sow in the fall of the year, but choose the early spring and summer, just before the ordinary season's rains may be expected.

A great feature too in its favour is that it is not difficult to eradicate if a paddock should be required for cultivation; ploughing alone will not do it, but by cultivation and bringing the plants to the surface, rolling and harrowing to free the roots from soil, it quickly dies by exposure to the sun. It is very tenacious of life if soil should be left on the roots, especially in wet weather, but it does not grow from pieces of roots like couch and some of the poas, but given plenty of cultivation and stirring and a few fine days and the trouble is over.

When the plants are far apart the grass grows into big tussocks, but as soon as the spaces are all filled up it forms quite as good a turf as any of the other grasses.

There can be no question as to its being an invaluable grass, and it is now being eagerly sought for in this district since it has passed the stage of experiment.

ANALYSIS OF HAY OF "PASPALUM DILATATUM."

By F. B. Guthrie.

The hay, of which the following is a complete analysis, was supplied from the

Wollongbar Experimental Farm, Richmond River :—

Moisture	10·55	...
Total albumenoids	10·31	...
Soluble albumenoids	...	1·38
Insoluble albumenoids	...	8·93
Digestible fibre	29·96	...
Woody fibre	27·95	...
Total ash	6·37	...
Soluble ash	...	4·32
Insoluble ash	...	2·05
Amide compounds, chlorophyl, &c. (by difference)	14·86	...
Total nitrogen	...	2·66
Nitrogen in amide compounds, &c.	...	1·01
	100·00	

I subjoin an analysis of hay from meadow-grass (name unknown) of English source, which will afford a comparison of the value of these fodders. From this it will be seen that the amounts of total albumenoids, and of digestible fibre, which are the chief factors in determining the feeding value of the hay, are very similar, with a slight advantage in favour of the *paspalum* hay. The solubility of the fibre, albumenoids, and mineral matter being, moreover, greater than with the English hay. The most striking peculiarity is, however, the comparatively large amount of nitrogenous matter other than albumenoids. The nitrogen in these combinations is of comparatively no feeding value.

ANALYSIS OF HAY FROM MEADOW GRASS.

Moisture	14·00
Soluble albumenoids	·98
Insoluble albumenoids	7·89
Digestible fibre	28·68
Woody fibre	22·92
Soluble ash	2·20
Insoluble ash	4·66
Amides, &c. (by difference)	18·67
Total Nitrogen	1·54
Nitrogen in amides, &c.	·12

The *paspalum* hay compares very favourably with ordinary hay, containing a larger proportion of digestible and nourishing material.

If both analyses are calculated to dry substance, it will be found that the *paspalum* hay shows the higher albumenoid content, the amount of digestible fibre being almost identical.

"Florida," Wollongbar, N.S.W.,
November, 1900.

Since the foregoing papers were written, I have everywhere extended my cultivation, of the *paspalum dilatatum* grass, and the more I see of it the better I like it; in fact, for a *permanent pasture giving a vast volume of good feed*, it has no equal, it makes a perfect pasture when hard grazed, and, as it does not mat on the ground, all the other grasses and clovers come up through it in their respective seasons, and thus give the *mixture* which is so necessary and beneficial for the stock.

A good deal of difficulty has been experienced by some in getting the seed to germinate, but although it sometimes takes a long time to show up, my experience has been that if good seed is used it will certainly come, and I conclude the difficulty has generally arisen through purchasing an inferior quality seed. The spring is usually the best time to sow, but even if the seed is sown out of season it will not damage in the ground, but will germinate as soon as the conditions are favourable.

For quick results the planting of roots is adapted, and in my opinion it is an excellent plan: they can be planted at almost any time of the year. The method I have adopted is to plant them four or five feet apart each way, and then sow the ordinary grasses and clovers over it, in the proper season; the *paspalum* will soon spread its seed and a good pasture be obtained. If the plants are put in during the early spring, they will at once make rapid growth, and in five or six weeks will give a lot of feed. Strong, old roots, should be chosen, as they contain enough moisture to start the growth, whereas seedling plants are very likely to die out. In planting, always use the spade, not the hoe; insert the spade, push the plant well down behind, withdraw the spade and trample firm. In this method a man and boy can plant from 1 to 1½ acres a day, and if the plants are good and properly prepared there will be very few misses.

I have for a long time been carrying more than a beast to the acre, and have not found it necessary to grow any artificial food such as green oats, sorghum, &c., and this in itself is a great saving of expense.

From January to the end of May last year, I was obliged to take stock on agistment in order to keep my paddocks well grazed down; during that period I carried

two-and-a-half beasts to the acre, and the owners of the cattle on agistment hoped I would let them bring more stock next season. This speaks for itself.

The analyses of the hay will show that the *quality* of the grass is undoubted, and I would strongly advise my brother farmers to use every endeavour in getting it established in their pastures. Do not, by any means, abandon the other grasses, cocksfoot, rye, prairie, and the clovers, as the mixture is necessary for the health of the stock.

There is no reason why our pastures should not give good feed all the year round if proper grasses are selected. The *native grasses* will not do it alone, as their season at the best is very short, and an unfavourable season renders them practically useless. H. M. WILLIAMS.

The Maggot Fly in Animals.

MESSRS. HURST BROS., of Berea Ridge, write to the *Mercury* :—We crave a little space in your valuable journal to advise dog owners to give an eye to their pets. It is evident these disgusting creatures (maggot-flies) are not particular what kind of animal they attack, human or otherwise. For some weeks past we have noticed tumour-like sores on some of our dogs, our attention being drawn to same by the continual licking of the parts by the animals, and treatment with various salves seemed to do little good. Yesterday, on closer examination, we discovered what these really were, and from two fox-terriers squeezed no less than 17 large maggots. There were, besides, several old sores, from which we concluded the maggots had already crept, or been licked out. The sores were nearly all on the chest, stomach, and inner sides of the legs, where there is least hair, and a few on the rump. The grubs would appear to possess great vitality, as they continued to move fully half-an-hour after being put into methylated spirits.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 17th April :—

Estcourt.—Chestnut pony, star on forehead, small white streak on nose, knee-halter marks on near front leg, two white front feet, cut in left ear, marks of old sore back. Black bull, white flanks, about 18 months old, four cuts right ear. Red cow, three cuts right ear, right horn turned down. Black heifer calf, white belly. Black cow, white sides, four cuts right ear. Black heifer calf, white flanks, six cuts right ear.

On the farm Paapkuilfontein, of Mr. R. Horner.—Brown mare, white star on forehead, branded LU left leg. Bay gelding branded TU left leg. Light bay gelding, white star on forehead, brand like anchor left leg, off hind foot white.

Woodstock.—Bay mare, legs black up to knees, long black tail, no brands, no marks. Dark brown mare, blaze on face, right hind foot white, white spots under saddle, no brands, no marks. Dark brown filly, one year old, no brands, no marks. Bay mare, no brands, no marks.

Howick.—Brown and white ox, white face, long horns, branded S in shield on left hip. White ox, horns turned side of cheeks, slit in right ear. Black ox, branded S in shield on left hip. White ox, black face, brand indescribable on right rump, indistinct brand on right hip.

Springfield.—On the farm of Mr. Jan Ventor van der Merwe, blue-and-white ox, short horns, no brands, white tail. Red-and-white ox, upright horns, no brand, dewlap been cut. Two-year filly, branded EG, long tail, dark chestnut.

Mossdale.—Black bastard Zulu bull, speckled white belly and legs, small patches of white on rump, white patch on forehead, one nick in both ears, no brands, aged. Value about £5.

Nqutu.—Three sheep (ewes), swallow fork right ear, bit off top left ear.

Mabehlana.—Bay mare, with one white hind foot, about 14 hands 3 inches.

On the farm "Loch Buighe," of Mr. W. L. Macfarlane, bay yearling filly, with small white star.

Irrigation in Australia.

LORD BRASSEY, in a lecture recently delivered at the Colonial Institute, made the following remarks with reference to irrigation in Victoria :—The Government of Victoria has not neglected the important subject of irrigation. The results, however, have not been encouraging. In view of the general inability of the water-trusts to meet their engagements, shortly before I arrived in Victoria it was decided to appoint a Royal Commission on water supply. Their report deals exhaustively with the subject. The policy of loans to local bodies for carrying out schemes of irrigation had its origin in the drought of unwonted severity with which Victoria was visited in 1865, which was followed in subsequent years by partial droughts, more or less severe. By these periodical visitations settlers in the affected districts were reduced to dire straits. In 1880 the necessity for guarding against the recurrence of such calamities caused the Government to engage the services of Messrs. Gordon and Black, two engineering experts, with instructions to report as to the best means of conserving water in the dry northern districts. In discussing how far it would be feasible and profitable to introduce irrigation as a great national work, Messrs. Gordon and Black pointed out that in all countries where irrigation proper has been long and extensively practised, we find some special physicial and climatic condition present, which governs the supply of water, and places it within reach of the cultivator, in greatest abundance at the time when it is most required, free of cost, except the labour and expense of directly utilising it. This seems to be a condition precedent to the establishment of all extensive systems of irrigation, and it may well be doubted whether irrigation on any extended scale is feasible where this is not the natural condition of the water-supply.

In the plains of Lombardy, Piedmont, and Northern Italy, in the Vega of Grenada, and the Huerta of Valencia, all the conditions favour irrigation, and the results are admirable. Though rain is very scarce, Valencia draws a supply of water from reservoirs inexhaustible in their abundance—from the snows of the central tablelands of Spain. Of these sources the Moors—skilled above all men in irrigation—knew well how to take advantage. Their work and its results have been described in glowing eloquence by Ford, the gifted author of Murray's Handbook for Spain. Irrigated by the artificial canals formed by the Moors, the rich alluvial plains know no agricultural repose. Man is never weary of sowing, nor the sun of calling into life. The produce is almost incredible, under this combined influence of heat and moisture. In one year four or five crops are raised in succession.

As in Spain, so in Italy, the rivers intersecting the plains take their rise in the Alps, and the melting snows yield water in abundance at the season when it is needed. In Victoria the natural conditions are not the same. The greater part of the water which the winter rains supply passes away into the sea as it falls.

Agricultural Shows.

Umvoti County (Greytown), Thursday, May 30th.
Polela (Bulwer), June 5th.
Lion's River Division (Howick), Thursday, June 27th.
Ixopo, Wednesday, July 3rd.

Devon Breeding.

INTERVIEW WITH MR. T. W. J. HALL.

By "ERGATES."

THERE are but few of the older Colonists who do not know Mr. Tom Hall, of Mount Arrochar, Mooi River, and of those who know him, none, I feel sure, will dispute my assertion that he takes unsurpassed pleasure and interest in farming. Farming with him is not so much a means to a pecuniary end as indulgence in what he has found a pleasurable life-hobby. To farm successfully was his chief ambition from the time he landed in the Colony some forty years ago.

In 1881 Mr. Hall was on a visit to England, and he made it his business to select a couple of bulls most suited, as he considered, to the requirements of the Colony. In the Colony he had seen the progeny of some English breeds, and the evidence offered by this young stock—especially in tell-tale springtime—made him determined to have nothing to do with their breeds. To what stock to select he devoted time and much consideration, and finally decided on trying the South Devon breed.

"How did you arrive at that decision? Are you a West countryman, and in consequence chose the breed with which you are best acquainted?"

"No; I am a Norfolk man, and although I think well of the Norfolk and Suffolk cattle, yet I did not think as well of the breed for South Africa as of the Devon. I reasoned the matter out in this manner: 'Here in the Devon is a beast that does well in hilly, poor country, and is therefore hardy; he is notedly good as a trek ox, and he makes first rate beef.' But if you will look up what Colonel Davy, the first compiler of the Devon Herd Book, says on the breed—it is quoted in Sinclair's History of 'The Devon Breed of Cattle'—you will find a better description than I can give off-hand."

DEVON CHARACTERISTICS.

I found the description; here it is:—"The general form of a Devon is very graceful, and exhibits a refined organisation of animal qualities unsurpassed by any breed. The expression of the face is gentle and intelligent; the head small, with a broad, indented forehead, tapering considerably towards the nostrils; the nose of a creamy white; the eye bright and prominent, encircled by an orange ring; the jaws clean and free from flesh; the ears thin. The horns of the female are long and spreading, gracefully turned upwards, and tapering off towards the ends. The general aspect of the head should in many points resemble that of the deer. The horns of the bull are thicker set and more highly curved, in some instances standing out nearly square, with only a slight inclination upwards. Red is the true Devon colour, which varies from a dark to a lighter, or almost to a chestnut shade. In summer the skin is mottled with beautiful spots of a slightly darker shade than the ground colour of the skin. The outline of a fat Devon very nearly approaches a parallelogram. The frame is level from the tops of the shoulders to the tail; the belly is longitudinally straight, and well filled out at the flanks. The breast is wide, coming out prominently between the forelegs, and extending downwards almost to the knee joint. The neck is long and thin, increasing towards the shoulder, which is tapered off to meet it. The ribs project at right angles to the back, with wide flat loins, and long rumps well filled out, thus enabling them to be loaded with more beef in the most valuable parts than almost any other breed."

"That is a pretty high appreciation."

"It is; but I do not think it much, if at all, overstated."

"And how about the bulls you imported, and redwater?"

"'Nelson' lived fifteen months, and 'Pondo' six. Out of fully twenty bulls I have imported, only two have been saved—one I sold and one I still have."

"Your troop must be getting pure."

"Yes: nearly all are now of the fourth or fifth strain, and after the sixth a herd is considered pure bred."

"What have you done at Shows."

"I have done well. I have carried off the prizes in the Devon class at practically every Show at which I exhibited. Also in the Slaughter Ox class I have done well: at the last Durban Show I carried off the prize for the best in that class; indeed in this class I have carried off all the prizes against all-comers for the last ten years."

"What is the biggest beast you have produced?"

"One, a six-year-old, who gave 1,400lbs. of meat. He was out of a cross-bred Friesland-Devon. In his third and fourth winters he got a little feeding, and in the fifth he was well fed—of course on farm-grown stuff only. The beef of Devons is also good—first rate, and it seems to have had that reputation for a long time. In the same book Lord Sommerville, so far back as at the end of the eighteenth century, speaks highly of its quality."

I transcribe the quotation:—"The fact remains triumphant for the West Country breed, that in addition to their well-earned character of being the best working cattle in the kingdom, they have for ages been confessed at Smithfield (London) to be one of the two or three best, if not the very best, as to quality of meat."

Milk, Butter, etc.

"And about milk and butter?"

"The milk of Devons, as you know, has a high reputation for its richness. Of course, like the milk of all breeds, it varies according to the feed. I have made only one trial, and that some years ago. The milk of four selected cows over two days gave 8lbs. of butter, which shows 1lb. of butter per day per cow. This, of course, does not compare favourably with what Devon cows of good milking strains will do on first-class pasture, and on that alone; in England returns of 2lbs. a day are not an uncommon, and with feeding 3lbs. a day has been topped. The quality of Devon butter stands high—many hold it cannot be beaten. I may here mention that Devon cows are excellent calf producers. Given fair treatment a cow will drop a calf every year, and that is a good deal more than can be said of South African cows in general."

"You were the first to import Devons into Natal?"

"I was. I suppose there are now half-a-dozen other importers of the breed."

"Do your Devon stock sell well?"

"They do. I have always a greater demand for young bulls than I can supply. I sell them when yearlings in September. Those not good enough are kept for oxen. The bulls go to all parts of the Colony—from the Coast to the Berg. From Mid-Illovo—one of the most trying districts in the Colony for cattle—I get good accounts of bulls I have sold, and so also from the Upper Mooi River, where the winters are probably the hardest."

North Devons.

"You prefer the South to the North Devon?"

Yes: The South I consider preferable. Firstly, they are larger and they are more of a dairy breed, and unfortunately of late years the breeders of bulls of North Devons have taken to pampering the beasts. I ordered one some years ago. He would not on arriving eat the farm fodder, and for some time he would take nothing but English hay. All that there was of that was a little that accompanied him. His coat on arrival was beautiful to the touch—soft and velvety: in a week it felt like a piece of rusty iron plate. He died a week later.

Management.

From our conversation on the general management of the troop I gathered the following facts. The veld is burnt once only in the year—the spring, of course. In the summer none of the cattle get more than they find in grazing. They are kept on the hills, and are not allowed to remain in vlei or low-lying ground longer than is necessary for drinking from the spruits. By this precaution the troop will probably escape fluke and gall-sickness. Much of the first disease, Mr. Hall is convinced, is due to permitting the animals to graze in damp places. (Readers of the *Journal* will remember what Mr. Pitchford recently wrote with respect to damp places and sheep fluke. Also, in an earlier issue,

No. 14, Vol. III., Mr. Jas. L. Webb, M.R.C.V.S., gives an instance of the disease in the Mooi River District. He further describes the nature of the disease, the predisposing causes, and systems of treatment.—Ed. *Agricultural Journal.*) Licks of sulphur, salt, and bones are freely provided. Incidentally Mr. Hall stated that he intends burning the bones in future, as a precaution against anthrax and other diseases. The crushed bones which one buys, he remarked, may come from animals which have died from disease, even from anthrax, which is so infectious that the beasts which die from it should be burned in quicklime, without even the smallest puncture being made in the skin. The precaution of burning the bones, he admits, may be unnecessary, but, as it entails but little trouble, he considers that it is advisable to take it. When the calves are two months old they run out during the day. Morning and night after they have finished sucking they are given a bite of forage.

Ticks.

Noticing a few odd ticks on the udders of the cows, I asked Mr. Hall what he did to get rid of them.

"We spray them," he replied, "with a paraffin mixture. The ingredients are three bottles paraffin, two of water, 1lb. of soft soap, and a small cupful of tar. The water is made hot, then the soap is added, and then the tar. After a thorough stirring, the liquor is strained through butter muslin, and the paraffin is then added. Two or three sprayings during the summer is quite sufficient to keep the udders clear: the ticks do not bother the stock on the ears or elsewhere.

Winter Feeding.

"Now for some information as to the feeding in winter."

"In the first place I send all the herd with the exception of the cows for milking, and a span of working oxen to a bush farm in the Karkloof. I believe greatly in a change of pasture. I think the change, both in going and coming back, acts as a tonic, and promotes the general health."

Ensilage.

"And for feeding the milking cows that do not go away?"

"The food that comes first is mealie ensilage. I am fully convinced that for this district, and, perhaps, for the most of the cattle districts of the Colony, that no better or cheaper fodder can be produced. I make round stacks of about ten feet high on steddles of six inches of rough grass. I try to build the stacks as quickly as possible, beginning, if convenient, on a Monday, and finishing by Friday or Saturday. Some weight their stacks with earth—I use stones. By-and-bye I expect Colonists will use elevators, but without them ten feet is quite high enough for lifting the heavy bundles. For ensilage I plant white mealies—horse tooth—about Christmas, and yellow a fortnight later. The crops are ready to cut when the mealies are beginning to get glazed."

"How would the cheap American broad tyre low-wheeled wagons do for hauling the mealie stalks to the stacks?"

"Just the things wanted, and I shall give them a trial soon."

I may here mention that the soil of Mount Arrochar is of strong, loamy character, somewhat similar to the soil in the neighbourhood of Estcourt.

Mealie-Hay.

"Mealie-hay is also an excellent fodder. I plant and cut the mealies exactly as if for ensilage. The stalks are stood in stooks, with a wire or grass rope round the upper part to prevent the wind from blowing them down. At the end of the winter the juice may be rung out from the inside stalks. There is one serious disadvantage attaching to mealie-hay, however, and that is, that the stooks must be opened out and dried after rain, and of late years, rain in winter in this district has been frequent. To shorten the time for that risk I always feed the mealie-hay I make before beginning on other fodder."

English Grass.

"I have given a good trial to English grasses, but none of my experiments have been successful. The last tried was Sutton's meadow mixture, but after two years only cocksfoot and red clover remained, all the fine grasses having disappeared."

Lucerne.

"Lucerne in years of ordinary rainfall gives grand hay and grazing. I have

been cultivating it for seventeen years, and until two or three years ago got as much as I wanted; generally three or four crops during the season. I planted on ridge land, and with plenty of bone dust. After it has been growing, say, five years I plough it in, and it provides splendid humus. Then I plant mealies, and the following year turnips, lucerne the next year going in again."

IMPLEMENTS.

In some conversation which we had on farm implements, Mr. Hall said he was a good deal struck by Mr. John Marwick's observations (No. 25, Vol. III.) on the anti-clog weeder, and that he intends trying one. He will, however, inspan a mule or a horse on account of the quicker pace of those animals. I was particularly interested in the seed and the fertiliser drills employed by Mr. Hall. Both are made by Coultas, of Grantham, England. They have been in use for some years, and Mr. Hall spoke in the highest terms of their efficiency. The day I visited Mr. Hall was not favourable for photography, but I managed to get a picture of a group which will be reproduced and published in a future issue.

Cold Storage and Refrigeration.

THE enormous progress made in recent years in matters connected with cold storage and refrigeration has affected the shipping industry perhaps more than any other business; and the striking fact that by means of this advance Canada has been able to increase her butter exports from £360,000 in 1896 to £1,200,000 in 1899, her cheese exports 25 per cent., and her export of eggs, fruit, poultry, and other perishable food products 33 per cent., is very convincing testimony of the truth of this assertion. The improvements in refrigerating machinery have been amongst the most potent causes of the great increase in the size of latter-day steamers, for perishable cargoes want plenty of space, and cooling chambers on shipboard, in order to be economical, must be large and roomy. A great deal of useful and interesting information on this subject is afforded in a report just published by Mr. Arthur Getty, of Her Majesty's Consulate at Chicago, the details of matters connected with cold storage and refrigeration in that town being gone into very minutely. It appears that in Chicago there are four large cold storage houses, representing some millions of cubic feet, each carrying on an extensive business in meat, eggs, poultry, butter, cheese, and fruit, and that the science of artificial refrigeration is carried on successfully in oil refineries, glue factories, india-rubber works, packing houses, dwelling houses, hotels, restaurants, distilleries, breweries, soap and chocolate factories, and wine merchants' establishments.

During the Paris Exhibition the demand for frozen poultry was enormous, and this year one company alone shipped 40,000 boxes from Chicago to the United Kingdom and France, whilst it is expected that the export of poultry this year will be the largest on record. An enormous business is already done, it appears, in the egg "canning" industry, America being said to be the only country yet engaged in this business. The extent to which the trade has already grown may be estimated from the statement that two packing-houses have now in their "chill" rooms about 216,000,000 eggs, obtained from the Western States in April and May last, at from 4d. to 6d. per dozen, and for which the wholesale price is now about 7½d. per dozen. Before being put into the cold chambers, which are kept at a temperature just below freezing point, the eggs are carefully "candled," *i.e.*, examined by being held up to a strong light in a dark room, and either packed in white wood boxes or stored in bulk in 50lb. tin cases. It is suggested that when taken out and thawed eggs should be used as soon as possible, that they should not be stored near cheese or other strong smelling product, and that the temperature of the room should not vary as much as one half a degree.

The storage of butter is also carried on with the same happy results, the practise of freezing this product being said to be more successful than that of cooling it, and immense quantities which went into cold storage in Chicago in June last at 9½d. a lb. are now readily marketed at 10½d. We are further told that experiments have shown that cheese will keep one year in cold storage, if it is in ripe condition previously, and dampness is excluded from the room. Successful results have also been achieved in the storing of all kinds of meats, at temperatures varying from 30 to 40 degrees, whilst the correct temperature at which fish should be kept after first being frozen, is said to be 25 degrees. It is asserted that fish can be preserved for an indefinite period, though six or eight months is generally considered long enough; and the process includes glazing, which is done to prevent shrinkage.

The average temperature for apples is 32 degrees. They are kept in barrels or boxes, and will, if good fruit, keep for one year. In this way, fruit stored in October at two to three shillings per barrel of 150lbs. will sell in May, in Chicago, for nine shillings. Grapes, bananas, lemons, oranges, peaches, and pears have been treated in like manner, and it is recommended that all soft fruits be placed in cold storage when ripe. In the same way the storage of vegetables has been carried on with capital results, cabbage, carrots, potatoes, and onions being kept quite sound for months after being packed.

An interesting feature of the Chicago refrigerating installations is that of possession by one of the companies of a street pipe-line system, whereby the liquid ammonia is carried five miles from the factory, thus supplying with refrigeration the produce and commission men along the route. This plant is not peculiar to Chicago, since there are other cities in the United States where refrigeration is supplied in the same manner to hotels, grocers, butchers, restaurants, and private houses. The people of the United States, owing, no doubt, to climatic reasons, have been thoroughly educated in the use of ice, and therefore companies which lay themselves out for ice-making and pursuits connected therewith have a far more numerous body of customers than in this country. Nevertheless, the need for preserving fruit, meat, and vegetables is even more pressing in a little North Sea island like ours than it is in a great world-extending continent like America, and whether the preservation of the harvests is conducted in England or the United States, the consumers of this country are bound eventually to obtain their share, a result which, it is gratifying to remember, can only be reached by the participation of the mercantile marine in the extra distribution involved.—*Liverpool Journal of Commerce.*

Agriculture in America and Europe.

IN the issue of October 26th, under the title "Around the World with an Agricultural Expert," we published an interview with Dr. N. A. Cobb, Vegetable Pathologist to the New South Wales Department of Agriculture, concerning the tour which he had undertaken upon behalf of his Department. The *Sydney Morning Herald*, N.S.W., for January 12th, gives some further details, from which we take the following :—

Dr. Cobb, of the New South Wales Agricultural Department, who returned here by the American mail steamer Sierra on Wednesday, has resumed his duties at the Department of Agriculture. About three and a half years ago Dr. Cobb left Sydney on a tour with the object of studying agricultural matters in America and Europe. He has gained a great amount of information, much of which will be embodied in reports to the Minister of Agriculture. During his absence Dr. Cobb has travelled the following distances :—Total, about 60,000 miles; United States, Canada, and Mexico, about 30,000 miles; Europe, about 10,000. The matters investigated by Dr. Cobb were as follows:

1. Visited about 40 agricultural schools and colleges in the United States, England, France, Germany, Denmark, Sweden, Canada, Algiers, Alaska, &c. 2. Examined various irrigation areas in California, Colorado, Utah. 3. Inquired carefully into the elevator system as used in the north-western part of the U.S.A., and at the Ports on the Atlantic Coast and Gulf of Mexico, also at Liverpool, Antwerp, and other European ports. 4. Made special inquiries concerning agricultural machinery as used at hundreds of points in the U.S., Canada, Europe, and Africa. 5. As appointee of the Governor of the State of Mass., visited all parts of Texas under guidance of the Farmers' National Convention. 6. As guest of the Agricultural College of the United States, visited all the agricultural industries. 7. Examined into the nature, cost, and practical details of the Mass. Gipsy Moth Commission. 8. As guest of the Government of France, visited typical French agricultural colleges, and all the agricultural industries in Northern France. 9. Studied the date industry as represented in the cases of the Northern Sahara. 10. Studied the fodder plants and other useful native plants of the drier parts of Algeria, with view to their introduction into Australia. 11. Made a special examination of instruments of precision as represented at the Paris Exposition. 12. Investigated the macaroni industry and macaroni wheats of Southern Europe. 13. Investigated the varieties of wheat used in the drier parts of California and Texas. 14. Investigated the orange and pine-apple industries of Florida. 15. Studied in detail the agricultural educational exhibit of the Paris Exhibition. 16. Studied in the field all the principal makes of combined harvesters used on the Pacific coast of the United States. 17. By frequent visits and personal intercourse with the chiefs of divisions studied the organisation and interior workings of the United States Department of Agriculture. 18. Made researches into the various co-operative agricultural industries of Denmark and France. 19. Studied the growth and commerce of cotton in Texas, Arkansas, Mississippi, and other Southern United States. 20. Studied into the latest method of dealing with the tick fever in Texas. 21. Made special inquiries into the subject of aeriel photography. 22. Made extensive inquiries into the subject of projection for educational and scientific purposes. 23. Made inquiries at length into the subject of plant-breeding, as practised in the best American and European establishments, particularly as to wheat-breeding. 24. Studied manual training as presented in the common and high schools of the northern United States. 25. Studied the distribution of the varieties of wheat in the wheat-growing regions of the United States. 26. Secured in connection with the above subjects 20 volumes of original photographs.

Dr. Cobb went first to the United States and spent more time there than anywhere else, because that is the leading agricultural country with reference to progress. He went to Washington, and was cordially received by the President in a private interview, and afterwards by the Ministers. All over Europe it was the same. In his travels he heard numerous compliments passed upon the work of the New South Wales Department of Agriculture.

"I spent much time," said Dr. Cobb, "in looking at the combined harvesters in California. I urged some of the makers to send some over here, because we have a lot of similar country here to that on which they are used there, but it is a matter for further trial here. These machines are now much cheaper and lighter. They are making machines that will work on the sides of hills, and they are running them on hills where we would hardly put a reaper and binder. They run large machines, needing from 24 to 30 mules. Fairly successful efforts are being made now to deliver the grain in bulk instead of in bags, as the elevator system has now reached the Pacific slope. That means that cultivators will have to abandon the system of bagging, and the harvesters will have to be altered so as to deliver the grain into wagons in bulk. The combined harvester is not found so successful outside the Pacific coast and the drier parts, where wheat can be left until it is ripe and the winds will not knock it out. We have a good deal of similar country. I can understand anyone raising objections from an Australian point of view. It may be said they have not been a success here, but it is to be borne in mind that the machines have been much improved. They are suitable for rolling ground. The conclusion forced

upon me in many parts with regard to big machinery is that wherever it is used it does not get a fair chance because they stick to the one crop. They are not farmers strictly, they are speculators. They grow only one crop, and do not rely upon a scientific system of farming.

"With regard to agricultural colleges, many of the foreign ones are very fine. We have nothing to compete with them as regards scale. The ideas I have gained I expect will be extremely useful, as our colleges are now in a formative period.

"It is wonderful," continued Dr. Cobb, "what the people of Denmark and France accomplished by co-operation. They are of a different class to our people, and have been driven to co-operation by dire necessity. Our farmers need not starve if they do not co-operate. The co-operative enterprise in Denmark reminds me of army discipline. They keep step like soldiers, and subordinating everything to the benefit of the association are accomplishing wonders. They are making good money. An impression prevails that the success of Danish produce in the English markets is due to Government assistance. I was under that impression until I went there. I find it is not the case. Neither is it due to superior methods in the dairy. I do not think their dairies are cleaner than those of Great Britain or America. Their success is not due so much to these things as it is to co-operation.

"With regard to the subject of plant breeding, I visited nearly all the great wheat stations in the world. I studied them in detail, and with the eye of one who has done considerable work in that line. While I have learnt a great deal I believe they have learnt a great deal from us. The work done in New South Wales by the different experts in this department is thought very highly of in different parts of the world where similar work is being done. In that connection it is only fair to mention the names of Messrs. Guthrie (chemist) and Farrer, of this department, and the wheat nomenclature of the rust conference some three or four years ago. A good deal of difficulty has been experienced with regard to the naming of wheat. There again I had the pleasure of learning that the work done in Australia was highly appreciated. You cannot talk intelligently about wheat or make recommendations unless you have a system of names which is thoroughly understood and applied to the same kind of wheat all over the world. Before leaving the United States I was called to a conference with the Secretary for Agriculture at Washington on the subject of the nomenclature of wheats I afterwards received a letter stating that the United States Department of Agriculture would take up the question on a similar line to that followed here."

Progress in the Fruit Industry of Queensland.

AMONGST the various States of the Commonwealth of Australia the first place must be assigned to Queensland in the application of the processes of fumigation to the destruction of insect pests of fruit trees and of other plants. Queensland has not perhaps done so much in this direction as Cape Colony, but has done far more than any other Australian colony. The work, indeed, has quite left the experimental stage, and for nearly two years the Queensland Department of Agriculture has had a complete cyaniding outfit at work in the citrus orchards in various parts of the colony, fully 20,000 trees having been treated by the departmental and private outfits. In addition to the fumigation of trees in the orchard many thousands of nursery stock and thousands of cans of fruit have been put through the cyaniding chambers, besides which several of the largest nurserymen cyanide every plant before it leaves the nursery. As to the efficacy of this mode of treatment Mr. A. H. Benson, who has charge of the operations, says that there can be no question, and he speaks with a large amount of practical experience. Having tested many kinds of sprays and spray-pumps during the last 13 years, both in California and various parts of Australia, he has yet to find a remedy that is super-

ior to cyaniding for the destruction of scale insects. The results of this method of treatment have been very marked, trees that were practically useless and even dying from the attacks of scale insects of various kinds having thereby recovered, and subsequently made extra vigorous growth and produced fruit of superior quality.

Few trees are subject to the attacks of so many kinds of insect pests as citrus trees—the orange, lemon, lime, and their allies. They are injured by insects that live by sucking the leaves, bark, or skin of the fruit; by insects that destroy the leaves, skin of the fruit, and bark of smaller twigs by actually devouring the same; by insects boring into and destroying the fruit; and by insects boring into and destroying the branches, trunks, and roots of the trees. The first-named group —the insects that live by suction—include the scale insects, aphides, and sucking bugs, and it is in the case of these that the gas treatment, or fumigation, is found specially effective. In the extensive orange orchards of California it has practically taken the place of spraying for the destruction of the red scale, the purple or mussel scale, and all other armoured scales. In Cape Colony it is now largely used for destroying red scale, and is found to be the cheapest and most effective means for suppressing the attacks of this insect. Extensive experiments have been made by the Queensland Department of Agriculture to ascertain the efficacy of hydrocyanic acid gas as an agent for destroying red scale, circular black scale, mussel scale, white scale, Glover scale, greedy scale, pink wax scale, and San José scale, and in every case success has been attained. In order to apply the gas it is necessary to envelop the tree to be treated with a gas-tight covering, in the form of either bell-tents or octagonal sheets. The former can be made large enough to cover trees up to 10ft. in diameter and 12ft. high, but for trees exceeding this size sheets are preferable, as bell tents would be too heavy and unworkable. The tents and sheets are made of the best Canadian duck, tanned for the purpose of preservation with a strong extract of iron-bark and wattle-bark. For charging the tent with gas it is necessary to calculate its cubic contents, and to provide one ounce of cyanide of potassium, one fluid ounce of sulphuric acid, and three fluid ounces of water to every 300 cubic feet of space. The water is put in an earthenware dish, the acid is next poured in very slowly, and the dish is placed under the tent, as far from the canvas as possible. The cyanide is now added to the solution, and the operator promptly retires from the tent, which he renders air-tight by every means available. The reaction of the sulphuric acid and the cyanide of potassium results in the generation of hydrocyanic acid (that is, prussic acid) gas, which is a poison that kills all scale and other insects subjected to it. The trees remain covered for 45 minutes. On account of the deadly nature of the insecticide many precautions have necessarily to be observed by the operator. Mr. Benson, who took the diploma of the Royal Agricultural College, Cirencester, 22 years ago, has constructed a very useful table of measurements of trees and quantities of material for the use of "cyaniders."

Not much progress has yet been made in England with this new insecticidal process, though it is unquestionable that a considerable degree of success has attended its application in warmer countries. Scale blight is not so troublesome here as in hotter regions, but our fruit growers are familiar enough with such a pest as, for example, the mussel scale, *Mytilaspis pomorum*. Of the closely-allied aphis blight they have a much larger experience, and it seems not unlikely that, for the suppression of this trouble, the practice of fumigation with hydrocyanic acid gas will be more largely resorted to in the future in this country.—*Daily News.*

In July, 1898, a gelding named Newman, by Newminster, was put up for sale at Brisbane as useless for racing, owing to unsoundness. He was bought for £9 and turned out for a rest, with the result that he made a complete recovery, stood training, and won races within a year of his purchase. Another horse which was "given away" by mistake was Mangere; he was going a-begging at £14, and a trainer named Williamson was asked to look at him. He did so, and declined to take the horse at any price. Mangere was then included in a batch of horses offered to a tramway company, and was weeded out by the buyer. He then found a buyer in a Mr. Paul for a £10 note, and not long afterwards won the Auckland Steeplechase. It was after this that the trainer Williamson, who had had the chance of buying him for £14 or less, offered £600 for Mangere, and failed to get him.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inanda & Ndwedwe	Lungsickness	H. Gillespie ...	Avoca.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein.
		,,	P. Boshoff ...	Smalldeel.
		,,	J. F. Maritz ...	Springbank.
		Lungsickness	J. T. Howell ...	Doornkop.
		,,	Joeisa ...	Klipfontein.
		,,	Toonyani ...	Chieveley.
J. Button ...	Estcourt, South of Bushman's River	,,	J. Mattison ...	Klipstone.
		,,	C. Harding ...	The Plains.
		Scab	C. P. F. Marais ...	Stockton.
A. H. Ball ..	Weenen ...	,,	C. P. F. Van Rooyen	Mona.
		,,	G. R. Van Rooyen	Vitooria.
		Lungsickness	Various	Weenen T'Lands.
		,,	Jogozalah ..	Woodford.
		,,	A. B. Bell ...	,,
		,,	Kamela and Kuhlawomhlaba	Inkasene.
J J. Hodson ...	Lion's River ...	Scab	F. Curry ...	Avondale.
		,,	Jas. King ...	Lyndoch.
		,,	Jas. Morton ...	Tweedie Hall.
		Lungsickness	A. Clark & Natives	Mount Ashley.
E. J. B. Hosking ...	Upper Umkomanzi	Scab	H. Nicholson ...	Alton.
		,,	E. E. Johnson ...	Cottingham.
		Lungsickness	H. Gillespie ...	Intimbankulu.
R. J. Raw ...	Impendhle ...	Scab	H. J. Martens ...	Wuthering Heights.
		..	T. Flemming ...	Good Hope.
		,,	H. Phipson ...	Boschberg.
W. Wilson ...	Polela	Lungsickness	H. Eaglestone ...	Coleford and The Bungalow.
W. Foster ...	Ixopo ...	,,	J. H. Johnson and Natives	Dronk Vlei.
		Scab	Native Pietman ...	Wesley.
		..	H. W. Chick ...	New Garrett.
		,,	C. Green ...	Gorton.
		,,	C. L. Hammond ...	Sunrise.
		,,	W. K. Anderson...	Maxwell.
		,,	J. Anderson ...	Lilliedale.
		,,	E. S. Clarke ...	Carr End.
		,,	Malambula ...	Location.
		,,	Budoza ...	Hlogozi.
		,,	Zinisani ...	Klipgat.
		,,	Solibamba ...	Lufafa.
A. J. Marshall .. (Acting)	Newcastle	Lungsickness	W. Dicks ...	Lennoxton.
		,,	A. A. Osborn ...	The Mount.
		,,	O. Schwikard ...	Boscobelli.
		..	Loxton & Rudd ...	Waterfall.
		,,	Native Shallos ...	River View, Ingogo.
		,,	H. P. Beare ...	Glen Hesit, Ingogo.
		,,	G. L. Fraser ...	Ingogo.
		,,	J. F. Grant ...	Hilldrop.
		,,	H. S. Dicks & Sons	The Retreat
		,,	Native Funwayo...	Tigerkloof.
		,,	W. Bower ...	Brampton.
		,,	Umbobo & Lugudu	The Gardens.
		,,	Velli, Finhlo ...	Leister.
		,,	W. Read ...	Newcastle.
		,,	Umgallas and Behleimpy	Rooi Point.
		,,	Umgodini ...	J. Adendorff's farm, Ingagane.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ... (Acting)	Newcastle ...	Lungsickness	Kotshaindoda ...	N. Dugenaar's farm, Ingagane.
		,,	J. W. O'Reilly, Natives Jonas, and Paplana	Newcastle T'Lands.
		,,	L. H. S. Jones ...	,,
		,,	Crowe Bros. and Roberts	,,
		,,	J. Hodgson ...	Belvedere.
		,,	Kaffula ...	Boschhoek.
		,,	Bob. Salugwanda	,,
		,,	A. Nottman ...	,,
		,,	P. L. Uys ...	Jackalspan.
		,,	T. Breary ...	Newcastle Colliery.
		,,	J. Davidson ...	Lennoxton.
		,,	A. Danks ...	Crown Colliery. Newcastle.
		,,	Beckeroo ...	Lennoxton.
		,,	J. Smith ...	,,
		,,	— Sheikamier ...	Newcastle.
		,,	J. J. Exsteen ...	Manning.
		,,	A. Paine ...	Mount Prospect
		,,	F. W. Hatley ...	,,
		,,	E. Parker ...	,,
		,,	A. F. Ross ...	Newcastle.
		,,	Ramsaroop ...	,,
		,,	G. J. Way ...	Vreda.
		Scab	C. de Wet ...	Schuinshoogte.
		,,	W. Adendorff ...	Hope Farm.
		,,	H. S. Dicks ...	Lennoxton.
		,,	J. Wessels ...	Wykom.
		,,	A. J. Middleton ...	Ingogo.
		,,	W. E. Few ...	,,
		,,	F. Johnstone ...	Craig.
		,,	Umkwenesi ...	Alcock's Spruit.
		,,	J. Dicks ...	Vet Klip.
		,,	F. R. Tewson ...	Rooi Point.
		,,	W. A. Lang ...	La Belle Esperanse.
		,,	J. Vanderwesthuise	Hartibeestelaagti.
		,,	— Hamilton ...	Eagles Cliff.
		,,	— Worthington ...	,,
		,,	W. C. F. Napier ...	,,
		,,	— Vanderplank ...	,,
		,,	A. P. de Jager ...	One Tree Hill.
		,,	G. J. Way ...	Vreda.
A. S. Parkinson ...	New Hanover ...	Lungsickness	E. Bentley ...	York.
		,,	Lugi ...	Blinkwater.
A. Hair	Umgeni and Borough of Pietermaritzburg	,,	T. Dawson ...	Zwaartkop.
		,,	J. Thompson ...	Gaol.
		,,	T. J. St. George...	Burger St., PMBurg
		,,	F. S. Tatham ...	Pine St., ,,
		,,	W. S. Shepstone...	Loop St., ,,
W. Wright ...	Klip River	,,	T. Ellison, G. Cowan, and G. E. Robinson	Ladysmith Town Lands.
		,,	Discharged Transport Cattle	Matowan's Kop.
		,,	Native Cattle ...	Portion of Farm Brakfontein.
		,,	W. J. Tully ...	Grobelar's Kloof.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
W. Wright ...	Klip River ...	Scab	Loot Sheep ...	Van Reenen's Pass
W. Freer ...	Upper Tugela ...	Lungsickness	J. W. Coventry ..	Rangeworthy.
		,,	D. Munger ...	Bedale.
		,,	Mr. and Mrs. C. C. J. Bester	Bester's Hoek.
		,,	W. Freer ...	Acton Homes.
		,,	G. Von Beneker ...	Drill.
		,,	H. H. Reed ..	Mains.
		,,	W. O. Coventry ...	Acton Homes.
		,,	H. Francis ...	,,
		,,	G. Spearman ...	,,
		,,	G. H. H. Coventry and Native	Rangeworthy.
		,,	G Spearman ...	Spion Kop.
		,,	F. Zunkel ...	Klein Waterfall.
		,,	T. H. Creevin ...	,,
		,,	Dr. Jones ...	,,
		,,	D. G. Giles ...	Upper Tugela Magistracy.
		Scab	J. Scheepers ...	Sand Drift.
G. Gielink ...	Zululand ...	Lungsickness	M. Titlestad ...	Ntingwe.
		,,	Dinizulu ...	Hlabisa District.
		,,	Noiwana ..	Nqutu.
A. Klingenberg ...	Umsinga ...	,,	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
R. Marshall ..	Dundee ...	,,	Marshall Bros. ...	Cleveland.
		,,	Pound Cattle ...	Domain.
		,,	— Dammann ...	Celle.
		,,	— Frockling ...	Henning.
		,,	W. Muller and C. Hellberg	Karlsburse.
		,,	— Schroeder ...	Schroeder's Hope.
		,,	do. ...	Rosenen.
		,,	— Haynes ...	Sterkstroom.
		Scab	— Hearn ...	Hatting Spruit.
		,,	J. W. Marshall ...	East Lynn.
		,,	— Ohlsen ...	,,
		,,	D. Meumann ...	Dundee.
W. A. Hutchinson	Alfred ...	,,	G. Whitelaw ...	Deemount.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	Faku ...	Mount Alice.
		,,	A. C. Beyers & Sons	Doveton.
		Scab	J. R. Vandermerwe	Noodhulp.
		Lungsickness	A. P. Vandermerwe	Poortje.
E. Varty ...	Umvoti—Western Portion	Scab	T. J. & C. M. Botha	Welverdient.
B. C. Shooter ...	Alexandra ...	Lungsickness	H. Reynolds ...	Inyangweni.
		,,	Umjanie ...	Pasture.

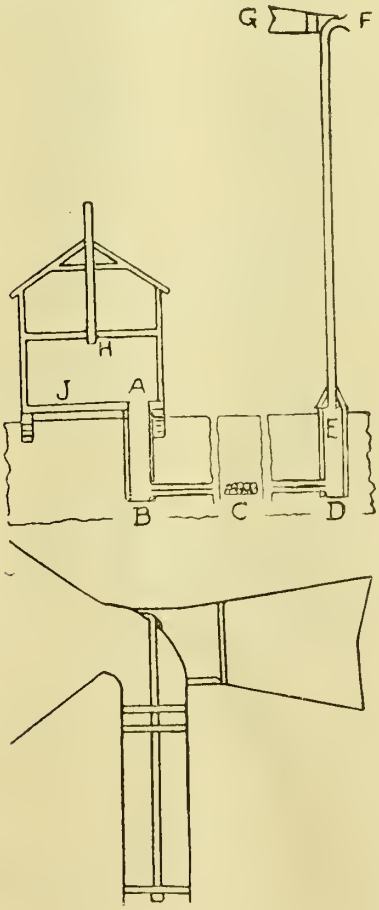
The whole of that portion of the Colony north of the Tugela River has been proclaimed by the Governor an infected area under the Lungsickness Act.

M. J. HIME,
for P. V. Surgeon.

Principal Veterinary Surgeon's Office,
13th March, 1901.

Cooling Dairies.

IN the last issue an illustration was given of an easy system of dairy cooling, providing the local conditions were suitable. Below will be found illustrated another system adaptable for a position which provides no natural conditions for letting in air to pass underground. The principle of these systems of cooling is derived from the fact that the ground at a distance of from 20ft. to 80ft. below the surface keeps the same temperature all the year round, which is slightly above the mean temperature of the locality. Less than 20ft. from the surface the soil gradually gets warmer, and the same thing occurs below 80ft. from the surface, owing to the internal heat of the earth. Our sketches are taken from the *Farmers' Review*, Chicago. The figures are self explanatory.



Natal Botanic Gardens.

CURATOR'S REPORT.

MR. J. Medley Wood reports: The recent rains have been of much service, but in consequence of the way in which they have fallen, though the amount seems fairly large, viz., 8·11 inches since January 1, it has come down in small quantities distributed over 29 days, and therefore has not penetrated the soil to any depth. Unless, therefore, we should have copious rains before the dry season sets in, our losses are likely to be heavy. I am sorry to say that in consequence of our not being able to obtain sufficient native or Indian labour, we are not able to undertake any improvement in the Gardens, nor can we, in fact, keep the ground in the condition I should like, and I begin to think it will be necessary to obtain indentured Indians, and supplement them by such natives and free Indians as we can obtain. I regret to say that the greater part of the fruit of the "sapodilla" was gathered unripe by mistake, leaving a very few only on the tree to ripen. These ripened well, and showed that the spodilla will prove a good addition to our list of Coast fruits. I scarcely think that it is a fruit that will bear carriage for long distances, and the consumption will, therefore, be limited to coast and vicinity. Seeds have been received as under:—Italy, 30; Agricultural Department of Zanzibar, 1; Maritzburg Botanic Gardens, 1; Scientific Department, British Central Africa, 1; Col. F. Addison, 1; T. W. Turner, 1. Free grants of plants have been made to the following:—Government House, £39 11s. 6d.; Botanic Gardens, Maritzburg, £2 5s.

In the Colonial Herbarium the preparation of the second part of the 3rd vol. of "Natal Plants" has been continued and will be completed before the date of my next report. Specimens and drawings of native plants have been named for various applicants in the following localities:—Weenen County 172, Klip River County 21, Durban County 13, Maritzburg County 3, total, 209.

A horse will live 25 days without solid food, merely drinking water; 17 days without either eating or drinking; and only five days when eating solid food without drinking.

Locust Destruction.

SOAP AND ARSENIC SOLUTIONS.

IN view of the fact that the idea prevails in certain quarters that nothing is being done by the Department of Agriculture in the matter of locust destruction, the Entomologist draws attention to the fact that not only has the excellent co-operative work of the Inanda Farmers' Association been subsidised during the past twelve months to the extent of £150, but also, that a considerable amount of valuable work has been carried out by Mr. Stock Inspector Robbins.

Recently Mr. Robbins has devoted a good deal of attention to the use of soap solution and arsenic solution, and from his reports the following notes are compiled.

The work with soap solution was commenced during the first week in January, and has been kept on up till present month (March). Writing under date of January 3rd, Mr. Robbins reports that: "For the past two weeks locusts have been, and are still, hatching from one end of the Tugela Division to the other. For some time we have not had flying locusts, but they have now made their appearance again. I have been experimenting with blue mottled soap, using 1½lbs. to 2 gallons of water, spraying it on to young locusts with a cattle syringe. The mixture takes effect in less than one-and-a-half hours. Buying soap at wholesale price, the mixture will not cost more than 2d. per gallon." Writing under the date of January 18th, he continues to the effect, that upon the suggestion of the Entomologist, he had made some check experiments, and found the soap solution most efficacious. On January 26th, he again reported the excellent results of soap solution. He remarks that: "While spraying outside a mealie garden my attention was directed to a swarm which had entered the mealies. The swarm was so thick that about one-fifth of an acre was completely covered. We set to work with two syringes and very few locusts escaped, the ground at the base of the plants being literally covered with them. This afforded a splendid test, as the mealies were coming into flower. I have tried the soap solution upon mealies three weeks old and it killed them, and I will report to you whether these mealies have been damaged or not." Writing eleven days later, Mr. Robbins reports: "The field of mealies sprayed with soap solution on January 23rd was inspected eight days later, and I found that the application had done no damage."

On February 11th, Mr. Robbins writes to the effect that he has up to the 9th inst. destroyed thirty-five swarms of locusts since January 18th. He finds that it takes about 12 gallons to destroy a swarm covering 100 square yards.

It is advisable, he considers, to wait for a swarm to collect after feeding, as is the habit of the wingless locusts, and then to spray them. In this way a swarm which, when feeding, will cover about two acres of ground, may be destroyed with 10-12 gallons of solution.

At the request of the Entomologist, Mr. Robbins was supplied in February with a knapsack spray pump for applying arsenic-soda-treacle solution. Commenting upon the use of this under date of March 4th, he finds that if the treacle is well boiled in water before mixing it with the arsenic and soda, the locusts take to it freely. But if the treacle is mixed without boiling, the locusts do not prefer it to the arsenic, soda, and sugar solution. After many trials he finds the following the best proportions for making up arsenic-soda-treacle solution:—

Arsenic	1¼ lbs.
Caustic Soda	8 ozs.
Water	4 galls.

Boil the soda and water and then add the arsenic, and boil till dissolved.

Then take

Treacle	1½ galls.
Water	4 „

Bring to boiling point, and mix with arsenic and soda solution. For use add eight gallons of water. He adds that "on February 27th a coolie farmer reported that his eight-acre field of mealies was being destroyed by locusts. I went over and found the mealies and ground covered with large hoppers, about two weeks old.

I received permission to break down mealie stalks at intervals throughout the field, so forming rows of stalks lying on the ground. These were sprayed with arsenic-soda-treacle solution. Two days later I examined the field and found that more than half the locusts were dead, and many dying. Had I been able to do this when the swarm entered, the mealies would have been saved."

With reference to the work done by the Inanda Association, it may be stated that £100 of the amount has been granted for this season's campaign, and in this connection the following report has been furnished by the Secretary of the Association :—

"I have the honour to enclose for your perusal three reports from our locust destruction officers, covering periods from January 29th to March 2nd, from which you will see that a total of 445 swarms have been destroyed in this period. We think this result is most satisfactory, and trust you will agree that we are making good use of the grant you were kind enough to make. The cost up to the end of February was £55 9s. 5d. We expect to raise between £120 and £150 ourselves, but as we have decided to engage a third officer, it will be a question whether we shall be able to continue operations until all the locusts have taken to the wing."

J. H. STANSELL, Secretary.

The operations of the Association are restricted to the uncultivated lands of the division, and much excellent work in locust destruction is maintained by individual planters.

Correspondence.

To the Editor of the Agricultural Journal.

HORSE-BREEDING.

SIR,—I have read Mr. Lloyd's further reply in your *Journal* of the 15th, and will now conclude with the following :—

Mr. Lloyd correctly says that I did not question his estimated acreage of the Colony suitable for horses, but I cannot allow him to think that I entirely agree with him. We each made a rough estimate off hand, as I put it *in any way* suitable for horses—I said ten per cent. He draws a geographical line across the map. We no doubt are both wrong, but I really do not think that even if gone into, and the exact area obtained, the result would justify the expenditure of the time. I have not considered the question of so much importance, and have therefore decided to rather confine my remarks to the other, and, in my opinion, more important questions.

I am satisfied to abide by my original contention as to the quality of the grasses, and am very sorry to say that Mr. Lloyd's arguments have only tended to further confirm my opinion, and I really believe that Mr. Lloyd is also quite of my opinion, and I find also Mr. Marwick is of the same opinion, viz., that Natal is no horse-breeding Colony. ["Ergates," on reference to him of this passage writes : "Mr. Marwick's words were 'This is not a horse country,' and I took them to have a local bearing only, applying, like his other observations, to the Richmond, or, rather, his own district only."—ED. *Agricultural Journal.*] In Mr. Lloyd's first article his assertions, viz. ; "That the breeding of horses on a small scale, such as owning one or two mares" ; and further on, "that there are very few farms in what are known as the midlands and upper districts of the Colony on which breeding a few horses would not pay well," justify me in saying Mr. Lloyd agrees that Natal is no horse-breeding Colony. Where we differ, I take it, is the why and wherefore.

Mr. Lloyd finds fault with my comparison of Natal and other countries, and says I should also compare prices obtained. I fail to see, when one is comparing two countries as to the quality of its grasses, or their respective capacities for horse-raising, any necessity for dealing with values of horses. I will, however, go further to meet Mr. Lloyd's desire, and state that in this, as in all other lines of business, a large turnover at

small profits is a much surer way to fortune than larger profits and a limited turnover. This is, I think, an acknowledged fact amongst business men, and one that Mr. Lloyd will never undermine.

Mr. Lloyd's comparison of man and horse is rather ludicrous. Many of our ablest men are very small men, and I have yet to learn that high feeding is essential to the production of able men. I think if Mr. Lloyd were to ask a medical man which was the best fare for man, he would get the reply that the second-class fare as set forth by Mr. Lloyd was far preferable to what Mr. Lloyd terms "lives like a duke," or "on the fat of the land." Mr. Lloyd asks whether I ever required a tonic? Yes, I am sorry to say, and very often, but not generally in the spring, but more particularly after the heat of the summer. Mr. Lloyd seems to think, too, that a change as applied to man is in the same way applicable to the horse. Mr. Lloyd's comparison of man and horse is a most unhappy one indeed. A change to a man is not that he gets different fare. He may, as most do, live on exactly the same diet, and yet benefit very considerably by a change of scenery, of vocation, of associates, and so on; items that cannot possibly have any effect on an animal, such as a horse, devoid of the power of reason.

Mr. Lloyd's idea that wire grass is a special provision of Nature is, I think, very far fetched, Wire grass, or sour veld, is the natural grass of our soils at an altitude of four and five thousand feet. It grows there because the soil and climate suit it, and our horses are obliged to go to these altitudes in the summer for the sake of the cooler climate, which renders them more healthy than the low veld, or Thorns, where the rich, sweet grass grows.

The game, from instinct, knew the Thorn veld was unhealthy during the summer months, and hence made tracks for the high veld, and not, believe me, because they preferred sour grass to sweet grass.

I can hardly take Mr. Lloyd as serious when he asks me to believe that sour veld is richer and more nutritious feed than the sweet veld of the Thorns. Mr. Lloyd may argue that the game, and also our herds, make for the high veld (sour grass) early in the spring, and before the Thorns become unhealthy or even very warm. Certainly they do. Why? Because the grass springs much earlier on the high veld, and there is absolutely no green grass in the Thorns until much later. Could we, however, by some means or other produce a growth of sweet veld in the Thorns very early, before it got too warm, believe me no cattle would leave the young, green sweet grass for the green sour grass.

Mr. Lloyd contends that poor soil will produce grass of high quality, and has proved it. If Mr. Lloyd has found a grass of high quality that will grow on our high, poor soil without manure, then the farming community will have to thank him for solving a question that has had the attention, unsuccessfully, of a great many men for many years. I am well aware that land may not produce mealies and yet produce good crops of other kinds. Rotation cropping is, of course, based on this very fact. I am sorry Mr. Lloyd did not give us the name or species of grass that stands 4½ feet high and very thick, and, I presume, of high feeding quality, that he has grown on fifty acres of land that would not grow a mealie stalk eighteen inches. Mr. Lloyd has discovered a grass, then, that is suited to the soil and the soil to the grass, and hence a most valuable plant, and further particulars *re* the production of this grass would be very valuable to farmers.

I did not think that it made any material difference whether I used a *non-de-plume* or signed my name, but at your request I have no objection to revealing my identity, and will attach my signature to this, my concluding article under this heading.

"EN PASSANT."
A. K. MURRAY.

BURSTING GRAPE-BERRIES.

Knowing that the Trappists are taking special interest in Grape Culture, Brother Nivard was asked to have the kindness to communicate any information he might personally have on the subject, or such as might be accessible to him. In reply he has been good enough to send the following letter. In a note appended he men-

tions that on the 14th instant he will be leaving Natal for a twelvemonth, a fact which will be of interest to the numerous colonists who know and esteem him. His knowledge is great and varied, especially in all concerning the mechanical arts, and all that he knows he is always willing to impart to others.

Dear Sir,—I am sorry to say none of us know or can suggest a remedy for your correspondent's bursting grapes. "Gros Colman" must be rather a delicate grape. With our different kinds cracking of the skins of the berries occurs very rarely. Bursting is the consequence of a dry spring and early summer, and if towards the ripening stage the rainfall becomes rather heavy—an almost regular occurrence in Natal—then an increased quantity of sap is forced to the berries, whose skins do not expand in proportion, and if of a brittle texture must necessarily burst. Grafting Gros Colman on Isabella stock might have a good effect. For instance, we could do nothing with "Virginia" from California, as it came, but after being grafted (root grafted) on to Isabella stock, it does splendidly.

I am, &c.,

BR. NIVARD.

Trappist Monastery, Mariannhill,
Pinetown, 1st March, 1901.

Dear Sir,—In reply to Mr. Delvin's query about his muscatel grapes breaking the skin when ripening, I think he will find that by keeping the branches entirely from all wet and rain that this fault will be corrected. The muscatel is a very "lusty" grape. Has Mr. Delvin manured too heavily? or pruned too severely?

All our grapes except Catawbas must be trained under verandahs or eaves; they cannot stand rain on the fruit when ripening. The Cape Hannepoort grapes scarcely ever have a shower upon them, and I fancy in other countries the summers are dry during the ripening process. Paper and muslin bagging and the like are better than nothing, but we find that grapes away from the drip of the rain mature beautifully, while those branches close up to a brick wall are the best. Hence the mistake of setting out the trellis work a foot or so from the wall. About manuring, vines can stand a lot of good treatment as a rule. I have pruned vines for a friend with the result of a heavy crop of grapes. A few weeks, however, before the ripening I met the owner who had a long face, saying his grapes were not blighted. My reply was, "blighted," all but starved.

Yours, etc.,

W. LISTER.

The Genesis of Basic Slag.

AN INTERESTING STORY.

SIR THOMAS WRIGHTSON, M.P., President of the Darlington Chamber of Agriculture, in the course of an interesting speech at the annual dinner of the above Chamber, on Friday week, told the story of how basic slag came to be added to the list of artificial manures. He had often noticed, he said, how one industry was linked to another, and how intimately agriculture was associated with the different industries of the country. Apparently it had nothing in common with the steel industry, yet he would show how it was closely connected with it.

Twenty years ago, he said, steel had to be manufactured from hematite iron ore, or other iron ore, free from phosphorus. About this time Mr. Sydney Thomas came to the Tees-side, and explained his process by which the bountiful supplies of Cleveland ironstone, rich in phosphorus, could be converted into steel. Under his guidance, he, Sir Thomas Wrightson, having joined, with a few others, erected the first steel works under this principle on the banks of the Tees. The steel from these works was named by Mr. Thomas basic steel; hence its by-product, slag, came to be known as basic slag. The latter often contained as much as 16 per cent. of phosphoric acid.

Mr. Sydney Thomas had recognised the value of phosphoric acid as a fertiliser, but the difficulty was to get it out of the slag, or to treat the slag so as to render it

available as a manure. He favoured an expensive German method of dealing with it by means of chemical agencies, and advocated the putting down of a plant for this purpose. But Sir Thomas Wrightson suggested that they should first submit samples to some qualified person to find out, if possible, whether the phosphoric acid was in such form as to need chemical treatment. Eventually, several samples were submitted to Sir Thomas Wrightson's brother, Professor Wrightson, of Downton College, Wiltshire, and who, at the time, held an important appointment under Government. The report they had from him was that he thought if the slag was ground to an impalpable powder, and applied to the land, the soil itself would carry out all the chemical processes necessary to convert it into plant food. Under Professor Wrightson's supervision, some samples were ground exceedingly fine, and sown, both at Downton and in the county of Durham. The produce of manured and adjoining unmanured plots having been carefully weighed and compared, its value as a manure was conclusively demonstrated. The idea of chemical treatment was abandoned, the slag was ground to an impalpable powder, put on the market as a new fertiliser, and, in the course of a few years, became one of our most popular of artificial manures.

This, then, is the story at first hand, probably the first time it has been publicly told, of how basic slag found its way on to the market.—*The Stockbreeder.*

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of February, 1901 :—

Name of Colliery.	Labour Employed. Above Ground. E.	N.	I.	Below Ground. E.	N.	I.	Coal raised. tons.	cwt.
Natal Navigation	14	90	86	10	312	80	9,555	6
Dundee	12	25	104	10	138	293	7,874	0
Natal Marine	10	82	22	8	3	300	7,840	0
Elands Laagte	12	16	105	9	145	205	7,770	0
St. George's	13	130	16	7	267	2	6,141	0
Natal Steam Coal	6	52	19	3	140	6	4,219	0
New Campbell	7	32	18	6	97	7	1,437	0
Newcastle	4	12	12	5	126	1	1,273	17
Inkunzi	1	8	0	1	39	0	507	17
Dudley	3	35	2	1	12	0	333	0
West Lennoxton	2	4	4	1	5	20	320	0
East Lennoxton			No Return.					
Crown			No Return.					
Total	84	486	388	61	1,284	914	47,271	0

Mines Office,
March 6th, 1901.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of February, 1901 :—

	tons.	cwt.	tons.	cwt.
*Coal Bunkered	...		...	17,463 9
Coal exported to Cape Colony	4,105	19		
Beira	87	19	4,193	18
Total bunkered and exported ...	...		...	21,657 7

*Included in this item are 529 tons 2 cwt. of Imported Coal.

Customs House, Port Natal,
4th March, 1901.

GEO. MAYSTON,
Collector of Customs.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of February, 1901.

STATIONS	TEMPERATURE (In Fahr. Degrees).				RAINFALL (in inches).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1900.	Total for same period from July 1st, 1899.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	85·8	70·2	95·2	65·7	3·56	17	1·33	8th	25·14	20·79
Stanger...	88·0	68·8	105·0	62·0	2·39	22	0·68	19th	26·31	18·89
Verulam	90·5	72·4	102·0	61·0	2·53	12	1·10	7th	26·36	19·49
Greytown	89·5	64·1	96·0	58·0	2·89	15	0·86	15th	21·20	20·62
Newcastle	...	66·9	...	63·0	5·35	12	1·98	7th	27·41	...
Estcourt	83·9	59·8	97·0	57·0	3·86	9	1·75	5th	23·18	22·35
Port Shepstone ..	79·8	...	94·0	...	6·33	10	2·10	8th	27·56	31·12
Umzinto	...	54·4	...	52·0	3·65	5	1·20	9th	21·59	21·64
Richmond	80·8	62·2	101·0	56·0	3·61	12	1·11	7th	24·36	25·53
Maritzburg	85·2	61·6	105·0	57·0	3·33	15	0·74	7th	20·48	22·49
Howick...	84·5	60·0	100·0	55·0	2·16	17	0·82	5th	15·24	21·14
Weenen	91·6	62·9	106·0	56·0	5·45	9	2·25	4th	23·26	18·50
Impendhle	84·5	53·2	93·0	49·0	4·17	8	1·07	15th	22·04	25·16
New Hanover... ...	85·9	62·1	103·0	56·0	4·74	17	1·75	4th	22·37	22·59
Hillcrest	77·0	64·3	94·5	59·0	3·31	17	0·93	8th	23·85	...
Mapumulo	86·6	64·5	103·0	40·0	3·02	16	0·49	20th	22·96	24·67
Nongoma	78·3	62·8	93·0	58·0	8·57	13	2·30	22nd	32·46	...
Umlalazi	81·7	67·3	107·0	55·0	3·74	12	0·75	20th	...	...
Hlabisa...	...	...	...	...	...	...	..	...	...	18·55
Melmoth	82·6	63·8	95·0	57·0	4·56	21	1·04	21st	24·64	15·60
Ubombo	79·3	65·6	95·0	59·0	6·87	16	1·29	20th	25·43	21·50
Eshowe...	80·8	66·0	102·0	61·0	5·03	18	0·73	26th	36·57	...
Point	...	.	...	...	2·78	10	0·75	8th	18·00	20·61
South Coast Junction	...	...	.	...	3·25	15	0·80	8th	...	...

OTHER STATIONS.

Estcourt	...	...	98	55	4·17	14	1·90	4th	24·45	23·10
Nottingham Road ...	...	...	...	...	4·46	13	0·90	4th	25·85	...
Adamshurst	.	...	97	53	2·33	14	0·62	7th	17·54	20·79
Hilton	...	...	97	56	3·27	17	1·30	4th	21·84	30·50
P.M.B. Tn. Bush Valley	...	...	...	...	3·91	15	1·08	4th	29·02	45·36
Ixopo, Gorton... ...	..	...	98	62	1·90	9	1·02	20th	10·81	14·64
Ennersdale	...	..	...	...	3·74		0·75	7th	...	...
Mid Illovo	...	...	96	57	6·83	15	1·29	20th	27·42	20·85
Ottawa	...		...	...	3·15	10	1·65	8th	25·81	21·12
Mount Edgecombe ...	...	...	99	67	4·20	11	2·63	8th	28·77	17·69
Cornubia	...	...	...	...	4·29	...	...	...	32·54	21·83
Milkwood Kraal ...	...	...	...	...	3·48	...	..	...	20·61	17·20
Blackburn	...	...	...	.	3·46	...	...	...	23·39	20·35
Saccharine	...	...	...	...	4·15	...	...	...	29·65	26·18
Prospect Hall... ...	...	...	..	...	3·51	...	...	..	28·03	...
Clairmont	...	...	...	...	3·53	9	0·77	8th	23·48	21·02
Equecfa	...	...	102	66	3·72	12	1·12	23rd	23·99	22·46
Umzinto, Beneva ..	...	...	...	...	3·44	9	0·82	15th	23·03	24·96

District Reports.

BULWER, 7th March.—The fortnight ended this date has been principally noted by heavy rains daily. The roads are in a bad condition, the repairs are washed away as fast as made, and transport riding is being pursued with the greatest difficulty. It is wonderful how the postcart keeps up its journey from Maritzburg to Bulwer every day without fail in spite of the heavy roads and wet weather. The last few days we have had very cold rains, which may or may not be a warning of the early approach of frosts. It will be a serious matter if we have frosts in this division before the middle or end of April, as the mealie crops are exceedingly backward. There was a large sale of stock held at the village yesterday, but it was much marred by the incessant rain falling throughout the day. Many entries arrived too late, delayed by the previous days to the sale being wet also. Though there were a good many buyers present, bidding was far from keen, and stock realised very much lower prices to previous sales. It was difficult to find buyers for cattle from across the East Griqualand Border in consequence of their being liable to get red water and gallsickness in Natal. I regret to have to report the outbreak of lung-sickness at the farm Colcford in this Division. Ten head of cattle have already died from the disease. Energetic measures are being taken to stamp out the outbreak. Sheep and horses, as far as I know, are free from disease.

H. W. Boast, Magistrate.

ENDWEDWE, 2nd March.—There has been a marked change in the weather during the past week, and I anticipate an early winter. Heavy rains have fallen, and the crops promise a good yield. I am afraid, however, they will suffer from the ravages of the locust, which are now in the hopper stage and are giving trouble in several localities; nothing is being done to destroy them. Several swarms are travelling towards the private lands in the adjacent Division, Inanda. I have tried the fungus without success, and think that the arsenic treatment should be tried, and feel sure of its success. There would be no danger of using the poison amongst the Natives. I noticed in your last issue an account of a trout being found caught between two stones in the Mooi River. Perhaps, it would be interesting to some to know that a little over a month ago one of the Police troopers stationed here happened to be returning from Verulam, and in crossing the Umhloti River, heard a splash, and looking round saw a large fish caught between two stones. He dismounted, secured it, and took it to camp; it was a large scale fish, weighing about 3 lbs. Fowls are scarce, and very few eggs obtainable. There has not been much fruit, the mango crop being a failure. So far there has only been one case of horse sickness, one of the Police horses dying on the 16th instant, of blue tongue. The Natives have lost a few goats, otherwise the health of the stock in this Division has been very good.

Walter H. Acutt, Magistrate.

GOURTON, Ixopo, 6th March.—The month of February was about the record for drought. Barring the 20th, when an inch fell, there has been no rain. The winds were mostly from the north. There has been rain all about, but in our Thorns' none. The grass is good, the mists keeping it going. Cattle are fat and looking well. The weather seems to suit them. We shall be able to cut some hay, thanks to the inch on the 20th. For the last fifty years, I have never seen the Ixopo so low Spruits have ceased to run: natives have to go miles for water for cattle and domestic purposes. The crops are almost nil. Someone will have to feed the black brother, or he will help himself. Away from the Thorns, on the top, mealies have recovered, and give promise of fair crops.

Chas. Green.

GREYTOWN, 4th March.—There have been no notes from this place for a considerable period; this has been due partly to the absence of remarkable occurrences. The cry for rain gradually died away as the season advanced. There has fallen since September, 20·78 inches of rain, which is somewhat over that of the whole of 1900, and has proved sufficient for the season's crop, although scarcely so for the replenishment of the springs. The mealie crop, and for the summer there has been little other than mealies planted, is promising exceedingly well everywhere. It is the crop which, perhaps, suffers less than any other—since the absence of locusts—from the various insects which seem to have engaged man in this land in the struggle for existence. The Division had acquired some fame for the excellence of its fruit, but I doubt whether the inhabitants will continue much longer in their efforts to grow it. I believe I am correct in saying that peaches have this year been almost entirely destroyed by the fly. Apples, plums, figs, etc., although they did not suffer in so great a degree, were also much damaged. I am told that a moth also, which has apparently not long been known to do so, has attacked the grapes in some parts, perforating the skin and causing them to shrivel. This is, however, for the present, only a small trouble. In the Mooi River Valley, the yield has been very heavy, proving its capabilities as a wine-producing area to be very great. The chief enemy to fruit, the fly, could, I believe, be kept to some extent in check if orchards were carefully watched and all that falls from the trees carefully, quickly and deeply buried. Except for some loss sustained by Mr. Otto, of Riet Vlei, from blue-tongue in his sheep, I have heard of no disease amongst stock. Horsesickness has scarcely manifested itself.

J. Y. Gibson, Magistrate.

NEW HANOVER, 11th March.—The rainfall during last week was 1·21 inches, which is a record for the District this season. Mealies are grown extensively in the Division, the best success having been obtained with the Hickory King. Fortunately for the farmer locusts are comparatively rarely seen. This is somewhat strange, as the mealie is their favourite food, and the crops in their present condition might be an inducement to the daintiest of locusts. The late rains protracted the planting, consequently the crops are late, but look none the worse for it.

A. RITTER, Magistrate.

N'KANDHLA DISTRICT, 28th February.—The rainfall during the month has been heavy, at the beginning of the month several severe rain storms passed over the District, and since then mist and drizzle have prevailed at the Magistracy almost daily. The health of the District has not been so good as usual, several cases of dysentery having been reported, and two or three deaths amongst the Natives took place. The crops have greatly improved since the last heavy rains, and there is every hope for a good harvest, especially on the high lands of the District, where they had not suffered so severely from the effects of the drought. No locusts have been reported. Two horses died of horse-sickness at the "Etala" Mission Station, otherwise, no diseases have been reported, and all stock is looking well. Thirty goats were killed by one flash of lightning at a Native kraal not far from here at the beginning of the month.

C. C. FOXON, Magistrate.

NQUTU, 28th February.—Fine weather with a plentiful rainfall, has been the order of the month. The rainfall was unusual for the period of the season, and we had one rain which extended over six days. Water is, as a result of the soaking rains, plentiful, and the springs have been well replenished to meet the coming winter. Crops have come on at a great rate, and, barring a severe early frost, should give good results. There are still a few isolated cases of lungsickness, but I am pleased to say that the disease does not appear to be spreading. The health of the inhabitants of the District, both European and Native, has been good, though one European is down with enteric fever.

C. HIGNETT, Magistrate.

PORT SHEPSTONE, 11th March.—During the past fortnight we have had steady, soaking rains. The total rainfall was 4·15 inches. All the crops are in consequence looking splendid, and the farmers are looking forward to a very heavy crop of mealies. The yield of fruit, especially of oranges and naartjes, will, however, be far below the average. The Stock Inspector informs me that he has come across a good many dead locusts. He has sent some of these up to the Veterinary Department to ascertain if it is the fungus that has killed them. The present is a very favourable time for the use of fungus down here. The highest maximum temperature was 83 degs., on the 9th inst., and the lowest 63 degs., on the 10th inst.

P. HUGO, Magistrate.

STANGER, 8th March.—Up to within a week ago we had a spell of dry weather, the ground being caked and hard. In some places farmers have been unable to plough for winter crops, owing to the ground being impenetrable. This has now been remedied by nice soaking rains this week, 1½ inches having fallen. Young locusts have made their appearance in nearly every part of the District. There has been a great demand for locust fungus, but as yet no results have been reported. I have heard of one or two planters spraying the swarms of young locusts with yellow soap suds, with good effect. In spite of drought and locusts, the crops, notably mealies and mabele, are looking well; the natives generally have planted mabele and very few mealies. What little stock there is left is looking well. There are no cases of disease in the District amongst horned cattle. Indians are going in largely for goats, which seem to do very well. Horsesickness and blue tongue made its appearance early. At one time it was thought these fearful scourges were again, as in 1899, going to play havoc, but I am glad to be able to report that during the last month there have been very few cases. The maggot fly has been very troublesome during the last three months; very few families have escaped a visit from this pest. I am glad to say I have heard of no illness resulting from it. In one case (Mr. ——— of Stanger) thirty-nine maggots were taken from a little baby four months old in the course of ten days. Mr. ——— informs me that the fly lays the maggot on clothing and on the body, and the maggot penetrates the skin. This he holds to have proved by ocular demonstration.*

A. J. S. MARITZ, Acting Magistrate.

*The Government Entomologist is of opinion that the remarks regarding the deposition of the larva of the bot or maggot fly, and its subsequent penetration of the skin, should be accepted with reservation.—ED., *Agricultural Journal.*

STANGER, 11th March.—The rainfall during the past month has been very uniform, and has greatly benefited all standing crops. Mealies bid fair to show a splendid return this year, and times are good for the small farmer. Cane, too, promises to yield well, though planters say that they can still do with a great deal more rain. Locusts are plentiful, as is usual at this time of the year, both hoppers and flying locusts, but they have so far done little harm. Stock is healthy, though a few horses have died from sickness. Cattle fetch as high prices in this as in up-country districts.

F. P. SHUTER, Magistrate.

UBOMBO, 1st March.—The total rainfall registered during the past month was 6·87 ins., and the minimum and maximum temperature, 59 and 95 degs. respectively. Rain fell on sixteen out of the twenty-eight days. The Inkuzi River was in a more flooded state than it has been for years, so much so, that the low veld to east of the Magistracy appeared to be more or less swamped. The Pongola also overflowed its banks to the north-east of the Magistracy, where it bends and trends towards the Usutu River

it was not, however, so much flooded as in the summer of 1892-3. Acres of native crops have been submerged consequently; but it is hoped no very great loss will be sustained. Four cases of sickness among cattle have occurred, owing, it is thought, to the undue amount of wet weather experienced. The symptoms are somewhat akin to lumbago with slightly deranged fœcal discharge.

A. R. R. Turnbull, Magistrate.

UMZINTO, 2nd March. — During the last three weeks copious rain have fallen at intervals, and, in most places, in time to save the mealie crops, which were very much in want of moisture. The crops of all kinds look refreshed by the grateful showers, and the fruit trees, which have been much parched, seem to have recovered, and to promise well for a good crop of oranges, naartjes, lemons, etc. The mangoes this year have been a very poor crop The mango is a tree that requires very little moisture, particularly when the fruit is forming, and the short crop this year arose from rain having fallen after the trees had flowered, and before the fruit was fairly formed. But I have noticed that we seldom get a good crop of mangoes too seasons in succession; and last season's crop was unusually heavy. This has been an exceptionally good season for tree planting here; and out of fourteen mangoes, six oaks, and one avocado pear, which I have transplanted, I have not lost a single tree. The summer has been an exceptionally hot one, but the hot nights and mornings seem now to be over, and the weather altogether very much cooler. I am sorry to say that the young locusts are still a great pest in many portions of my Division, though some poisoning has been done to advantage, in several portions of the District. I fear the time has passed to hope this plague will spontaneously remove itself; and that the only chance now is to attempt their extermination by determined measures. About six weeks ago considerable damage was done by a flight of large locusts in this immediate neighbourhood; and the sugar cane suffered rather severely; but since then few have been seen here, though I hear of their ravages in the outlying districts of the Division. I am glad to say that the season has been a very healthy one for cattle. No cases of lungsickness or other epidemic have not been reported; and I have not heard yet of any case of horsesickness in the District. It is to be hoped we may escape this latter pest. The grass still continues plentiful, and good as the pasture lands, and, as a result, the cattle everywhere look sleek and fat. The Alexandra Agricultural Society, I believe, have decided to hold their Show in July, and I think one may look forward this time, at last, to a creditable exhibition of all things agricultural and horticultural.

Jas. McLaurin, Magistrate.

Wattle Ash for Manure.

THE Etomologist when recently in the Dalton district had his attention drawn to large accumulations of waste wattle wood, twigs, etc., which, being of unmarketable valne, were allowed to rot on the ground, and was questioned as to the manurial value of waste if reduced by fire to ashes. He reported to the Commissioner of Agriculture, and the samples he had collected were forwarded to the Analyst of the Department for analysis. The report is subjoined.

Commissioner of Agriculture—

For the purpose of determining the fertilizing value of wattle tree ash (*Acacia Mollissima*), I have examined the samples you forwarded, viz :—

No. I. — Ash obtained from large branches.

No. II.—Consisting of ash and earth taken from a heap which had been exposed to the atmospheric conditions for two months.

No. III.—From a heap of ash and wattle leaf mould.

No. IV.—A sample of soil in which wattle trees are growing.

The last, although not bearing directly on the value of wood ash, is of interest as an illustration of the sources from which the trees can draw their supply of food material.

I have tabulated the percentages of the chief ingredients found in the samples, as under, for the sake of comparison :—

	Potash.	Phos. Acid.	Lime.	Magnesia.
I.	4·994	1·332	4·187	1·458
II.	0·442	0·135	0·490	0·114
III.	0·428	0·127	0·351	0·246

It is most probable that samples II. and III. have lost much of their soluble constituents from leaching during exposure to rain and moisture, and consequently a comparison cannot be drawn between them and No. I. to show the difference between fresh and leached wood ash, as they contain much foreign matters in the

shape of small twigs, leaves, and a large bulk of soil, which has the effect of considerably diminishing the fertilizing constituents and rendering comparison unreliable. They are however of interest in themselves as a guide to what such material is really worth. The proportions of the ingredients are somewhat similar to that of farmyard manure, though a little lower, nitrogen being about half of that contained in the latter. They resemble it in being all-round fertilizers, but do not possess the superior qualities of farmyard manure in its adaptability for supplying organic matter and improving the mechanical condition of the soil, and further, their collection, if very much distributed, is sure to increase the amount of sand and soil in their bulk, so that it is doubtful if they are of value beyond local distribution.

The better plan would appear to be an accumulation of the branches, leaves, and refuse before burning, so that the ash resulting would form larger heaps, and consequently be much more easily handled, besides being more concentrated. It would then form a most valuable fertilizer well worth handling and spreading.

These samples Nos. II. and III. are not wood ashes in the true sense, but rather, are ashes largely admixed with soil and refuse. True ashes, especially when freshly burned, possess a much higher value, due mainly, but not altogether, to the potash they contain. They are alkaline in nature, and exert a beneficial action on moist soils in sweetening and rectifying any acidity. With the exception of nitrogen, in which they are deficient or wholly wanting, they may be said to be all-round fertilizers, although not well balanced ones. They form a good basis for a complete manure, with potash as their dominant ingredient. They may be reinforced with phosphoric acid and nitrogen from another source to make up a fertilizer suitable to requirements, but care must be taken in mixing with artificials containing nitrogen—the same precautions which have to be used as in the case of lime or basic slag.

If we take the above sample No. I. and apply the unit value in use in the Colony for the sake of comparison, its value per ton of 2,000 lbs. would run about as follows :—

	£	s.	d.
Potash, 4·994 @ 5s. 4d. ...	1	6	8
Phoshoric Acid, 1·332 @ 5s. 4d.	0	7	2
Lime, 4·187 @ 10d.	0	3	6
Per ton	£1	17	4

These figures are assumed for the sake of comparing different artificial manures, and represent as nearly as possible the relative values of the different ingredients. Probably, however, in wood ash the value set down should be rather higher. The potash, compared with that of kainit, muriate, or sulphate of potash, is quite as valuable, and the organic source of the ingredients has the effect of making them in an extremely suitable state for plant food material.

The sample No. I. is rich in potash, and contains a fair amount of phosphoric acid, but is remarkably low in lime. Most wood ashes have a very much higher percentage of lime than this sample contained; it is a valuable fertilizer and well worth the attention of those within whose reach it comes.

Freshly burnt ash is of far more value than that which has been exposed to rain for any length of time. If it is inconvenient to use it when newly prepared, the best plan is either to work it into the compost heap or place it under cover so that it may be kept dry by being secure from rain and moisture.

The sample of soil (No. 4) contained 0·066 per cent. of phosphoric acid, 0·301 of potash, 0·042 of lime, and 0·168 of nitrogen; it is rich in potash, fair in phosphoric acid and nitrogen, but like most Natal soils very deficient in lime.

Regarding the Entomologist's remark that the opinion is held by some farmers that wattle leaf mould is injurious to vegetation, the investigations I have made induce me to believe that such is a fact on account of the tannin (tannic acid) which it contains. This, acting as a preservative and preventing the decay or decomposition of the organic matter in the soil, to a certain extent cuts off the natural supply of nitrogen necessary for plant growth.

ALEX. PARDY, F.C.S., &c.,
Analyst to Agricultural Department.

7th March, 1901.

Gleanings.

A dairyman says that milk should never be taken to the factory or creamery in a springless wagon, as the result will be the churning of the milk and cream, which then becomes less available for the making of first-class butter by the creamery butter-maker.

An effort is being made in Germany to stimulate the consumption of fruit, particularly preserved fruit. This is not because there is an oversupply of the product, for the reverse is true, Germany not growing enough to meet her home demand, but physicians recommend it for sanitary reasons, and the fruit dealers acquiesce, believing that it will raise prices. The chief reason, however, is believed to be the desirability of finding an outlet for Germany's surplus sugar, which could thus be largely utilised.

The Queen was a genuine dog lover from her childhood; it is probable that in the course of her long life she owned a larger variety of dogs than any owner in her dominions. She was a frequent exhibitor, and the Queen's cottage near the kennels in Windsor Home Park contains numerous paintings of her favourites, both those known to the public by their successes on the show-bench and others.

In August, 1899 the Egyptian Government, having been satisfied that rats were instrumental in disseminating plague, issued an order directing the police to take measures to destroy all the rats they could in Cairo. This edict offered an opportunity of money-making which certain Arab swindlers quickly turned to account. They industriously spread news of the police order, but they stated that it was applicable to *poultry*. Naturally, a scare followed. Hundreds of native fowl-keepers sold their birds for whatever the swindlers chose to give them, and the latter thus made a handsome profit.

A singular race was run at Ridgewood Park, New York, in the summer of 1899. The competitors were a large elephant, ridden by his keeper, a professional bicyclist, a motor car, a camel, and an Australian horse, used in the circus to which the other animals belonged. The race was four times round a quarter-mile track, and the management proposed to make it a time handicap. This, however, could not be done, as when the starter took his field in hand there was too much unpleasantness. The elephant objected to the cycle and to the motor car, the camel objected to everything and everybody, the horse would not go near the camel, and the bicyclist was in mortal terror of the elephant; the motor car was, in fact, the only decently obedient competitor of the lot. Eventually the elephant and camel were despatched by themselves with two laps start of the bicyclist and horse, the motor car being scratch. It was a sensational race owing to the conduct of the field, but on the handicap the elephant won, bicycle second, motor car third.

In South America the breeding of mutton sheep has increased until now about 70 per cent. of the clip that formerly was all Merino is all English or cross-bred wool.

If you have not a weighbridge on your farm you cannot be up to date. It is indispensable, and infinitely more businesslike than dealing in a haphazard manner. A farmer of an important holding told us the other day that he disposes of his fat stock to the butcher at so much per cwt. live weight on his farm. It saves expense, and puts money in the farmer's pocket.—*The Farmer.*

Experiments in the treatment of potato scab carried out in the United States have elicited a result in favour of powdered sulphur as the most effective application. This material is dusted over the sets before they are planted, and is also applied to infected land, the quantity advised for the latter purpose being 200lbs. per acre. In treating the seed potatoes they should be shaken up in a sack with some flour of sulphur, in order to make sure that all the tubers are completely covered.

The *Field* records the adventures of a lucky horse. He was bought by a gentleman in Cheshire, who hunted him until the war broke out, when he accompanied his owner to the front. He went through twenty-eight engagements and was hit three times, twice in the nose and once on the quarters. He was one of the first horses to enter Ladysmith, and of 296 horses in the contingent to which he belonged this was the only one to return home alive.

William Taylor, in the *Cape Times*, says:—Some years ago I lived in a large old-fashioned thatched house that was infested with rats. I now and then caught a fine specimen and starved him. Having got him ravenous for food, I put a freshly-caught rodent in the cage. The starved wretch immediately fell upon the new-comer, slaughtered him, and set to work to devour him. I would then let the cannibal loose, and he henceforth became a devouring enemy of his kind. I cleared my house in this way of hundreds of rats. The remedy is simple, and costs nothing.

In a few weeks, says the "Journal of Commerce" a new industry will be commenced in Jamaica for the establishment of a factory for the manufacture of cocoanut butter on a large scale All the necessary machinery has already been imported from the United States for the work, and steps have been taken for the erection of buildings needed for the industry. Contracts have been entered into with Jamaican houses for the supply of cocoanuts, and the whole scheme is well advanced, and is giving satisfaction throughout the island.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—There is nothing of importance to report since our last. From information received, there is every indication of a grand crop of mealies being assured, and all the crops are reported to be looking well. Prices all round are easy; in fact, too much so to please producers.

Mealies.—There is every indication of prices declining. During the past fortnight small samples on the market have been up to 6s. 8d. per 100lbs., whilst others have been down to 5s., 4s. 9d., and 4s. 3d. per 100lbs. A good few mealies have changed hands at 11s. to 12s. per muid, including sack.

Forage.—Small parcels are being offered at prices varying between 6s. 10d. and 8s 4d. per 100lbs.

Hay.—A fair quantity offered daily, and prices have been as low as 1s. 6d. up to 2s. 8d. per 100lbs. Bedding from 3s. 6d. to 27s. per load.

Potatoes.—Early Rose, from 6s. to 18s. per 100lbs.; Beauty of Hebron, from 6s. to 16s. 6d. per 100lbs.: Red Roughs, 8s. 6d. to 12s. 3d. per 100lbs.; Magnum Bonum, 7s. 6d. to 10s. per 100lbs.; Up-to-dates, 13s. 3d. to 15s. per 100lbs.; Sweet potatoes, 7s. 6d. per sack.

Beans.—From 10s. 6d. to 17s. per 100lbs.

Onions.—From 17s. to 25s. 6d. per 100lbs.

Pumpkins.—From 2s. 6d. to 10s. 9d. per dozen.

Mabele.—From 10s. to 12s. 3d. per 100lbs.

Tobacco.—From 4d. to 1s. 2d. per lb.

Butter.—Market better supplied than it has been for some time past; prices have ruled between 8d. and 1s. 11d. per lb.

Eggs.—Eggs still command a good figure; prices varying between 1s 9d. and 3s. 5d. per dozen.

Poultry.—Fowls, from 1s. 9d. to 4s. 6d. each; geese, 7s. 3d. each; ducks, 4s. 9d. to 10s. 9d. per pair; turkeys (cocks), 10s. to 16s. each; (hens) 6s. to 7s. 6d. each.

Sundries.—Almost a bit of everything has fallen under the hammer of our Marketmaster during the last fortnight:—Bacon, from 1½d. to 6½d. per lb., ham, 10½d. to 11d. per lb.; mutton, 5d. to 10d. per lb.; beef, 3½d. to 7d. per lb.; pork, 1½d. to 9d. per lb.; tea, 1s. 1d. per lb. Fish was sold on several occasions, and the climax was reached when our genial M. M. disposed of a mischievous monkey for the sum of 8s. 6d.

Vegetables.—Beans, beetroot, cabbages, carrots, cucumbers, marrows, green mealies, rhubarb, and tomatoes comprise the varieties sold.

Fruit.—Apples, bananas, grapes, granadillas, lemons, mangoes, peaches, pears, pineapples, plums, and quinces are sold every day.

Wood.—Wood is cheap at present, some mornings only realising 5d. per 100lbs., the highest price obtained being 10½d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade has exhibited a marked improvement lately, and in connection with the prospect of an early termination of the war, there is a more buoyant feeling amongst the commercial community.

Mealies.—The market is very flat, and holders of old season's stock are badly "left." They are not greatly to be pitied, as rates for many months were as high as the most covetous could desire. Owing to the continued wet weather only small lots of new season's grain are being offered, and for these dealers will only bid about 10s. per muid. The crop is enormous on the coast, and it will be rivalled when the up-country crop comes in later on.

Potatoes.—Very few are being offered. The growing crop is looking grand, and should prove heavier than for many years past. The few good samples which are to hand readily bring from 19s. to 21s. per muid, but these are fancy rates.

Mabele is in demand; but very little is being offered. The new crop should be ready shortly.

New season's hay is eagerly awaited, and will be in great request, as fodder of all description is scarce.

WOOL.

Mr. James Egner writes:—There have been no sales since I last wrote. The season's wool has been considerably below the average in quality, a fact that the agents of shippers remark on. The causes, however, are well known. The spring was very dry, and without good rains previous to shearing grease wool is always dirty and heavy. Again, owing to the unusual trekking of many of the sheep arising from the war, the condition of the sheep was too poor to produce good wool.

LIVE STOCK AT LADYSMITH.

Messrs. Walton & Tatham held a sale of stock, at their Mart, Ladysmith, on Saturday last, the 2nd instant, when 370 head of cattle belonging to sundry persons, were disposed of at the following prices:—

140 head of mixed young cattle, £5 10s. per head.

100 cows, £7 to £10.

61 heifers (1, 2, and 3 years old), £4 15s. to £7 5s.

66 young oxen (1, 2, and 3 years old), £4 to £7 15s.

1 bull, £10.

2 cows, with calves, £14 and £15 10s.

The total amount realised by the sale was £2,345 15s.

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AND MINING RECORD.

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CONTENTS.

Paspalum Dilatatum.

ALREADY IN NATAL.

MR. J. MEDLEY WOOD, the Curator of the Botanical Gardens, Durban, being the leading and, indeed, the sole authority on the grasses of Natal, was asked last week to be good enough to give what information he might possess as to *paspalum dilatatum* for publication in the *Journal*.

In the course of the conversation Mr. Wood stated that he had read with much interest what the Hon. F. R. Moor had to say with regard to the agricultural value of *paspalum dilatatum* because he himself felt sure that the grass would thrive in Natal—certainly on the upper portions, and very possibly along the Coast also.

"In 1897," continued Mr. Wood, "I was the first to discover *paspalum dilatatum* in Natal. I was on a botanising tour in the northern districts, and one day while in Newcastle my attention was attracted by a small patch of grass unfamiliar to me growing in a fenced in, but unoccupied, erf. I secured a specimen. At first I took it to be *paspalum scrobiculatum*, a noxious plant, when in seed, for cattle; but finding differences on microscopic examination, I sent it to Kew for determination. The reply was: 'The specimen is very probably *paspalum dilatatum, Poir*. It agrees at least with cultivated specimens named thus in Gay's

"Herbarium." Whether these are correctly determined or not Dr. Stapf cannot say at present; they differ somewhat from the majority of the Kew specimens of *P. dilatatus* collected in South America. The plant in question is certainly introduced in Natal as in the case in Mauritius.' There is a touch of uncertainty in the description, and I have had no further information; but since then I have myself carefully compared this grass with the standard descriptions of *dilatatum*, and I have not a doubt that the genuine *dilatatum* is already growing, although probably in small accidental patches only, in various parts of the Colony. The testimony with regard to its economic properties by Baron F. von Mueller supports what was published in the last issue of the *Journal*:—

'*Paspalum dilatatum*: Perennial, of excellent quality for fodder; keeps green during the hottest summer time. It grew 4½ feet in little more than two months in New South Wales, after a drought which was followed by heavy rains. It is reported to have extraordinary drought resistance. Introduced into Australia by Baron F. von Mueller.'

"It may be worth mentioning that I feel pretty sure that I saw the *paspalum dilatatum* in 1898, I think half-way between Greytown and Maritzburg, when travelling by post-cart.

"Yes, if I get any seed I shall, of course, try to raise a small quantity of the grass in the Gardens, but such kind of experimental work we can only do on a very small scale here.

"I shall, as you suggest, send a specimen of the dried grass to the Commissioner of Agriculture for the use of the Department. If any wish to see the grass green and growing—though it is now somewhat late in the year—they will have to go to Newcastle, unless by the verbal descriptions, and the dried specimens, they can identify it growing nearer. My nephew, Mr. Frank McKen, at Messrs. Oldknow's store, knows the grass, and I have no doubt will be happy to point it out to any who take an interest in it."

With reference to the propagation of *paspalum dilatatum*, it may interest Natal nurserymen to learn that in Australia their confrères make the sale of roots one of the features of their business. The roots are commonly retailed at £1 per 1,000, or 2s. 6d. per 100.

Mealie Blight.

ANOTHER FORM.

By Claude Fuller, Government Entomologist.

AMONG the several notes which have appeared in these pages under the above heading, one contributed by Mr. John Marwick, of Richmond, will be remembered with particular interest. In the course of his remarks Mr. Marwick laid stress upon the fact that two diseases had come under his observation, one characterised by the variegation or yellow striping of the leaves, and another disease of a destructive nature. I have never had the fortune to have specimens of the second disease from Mr. Marwick (perhaps my misfortune in this matter is his good fortune), but I have recently had my attention called to a second form of mealie blight at Mooi River, which has much more serious results than the striped-leaf disease. This particular disease is due to a fungus related to that which causes potato blight in Natal, and is, I believe, identical with *Helminthosporium turcicum*. This fungus is commonly called Maize Blight, and has been recorded from Southern Europe, Queensland, and the United States. A field suffering from its attack has a general sickly yellow appearance, and looks as if it were suffering from bad drainage and an excess of water about the roots of the plants.

The disease first appears in the form of numerous, small pale patches upon the blades, and these are easily seen to be within the tissue, and not at all superficial. These small patches gradually in-

crease in size and run together, and the whole leaf, or large parts of it become of a pale yellow colour. Subsequently these yellow patches turn brown and the tissue dies and dries up, becoming brittle and easily broken. The particular fields which came under my observation were no doubt suffering from a severe and even attack, as the older leaves were quite dead, whilst the newer were the healthier, although marked all over with these small yellow patches. The intermediate leaves were in intermediate stages of attack. Some were quite yellow in parts, others were wholly yellow and the tips turning brown, whilst in others again, half the leaf would be dead, and the basal half yellow or reddish brown.

After the leaves have turned brown a fine and delicate film is to be noticed upon its surface. This is the later stage of the fungus, and if it is examined with a powerful microscope this little filmy growth will be seen to be carrying numerous little fruits known as spores.

In conjunction with this disease a good deal of maize rust was also noticed, but I think that this was due to the impoverished and weakened state of the tissues. It is impossible in this instance to ascribe the attack to any particular cause, although there is a possibility that the plants were sown too thickly, being ensilage mealies, and also that there was an excess of water in the soil.

In considering preventive treatment, an important point to bear in mind is the fact that the leaves bearing the spors of the disease become brittle and break off, and so impregnate the soil with spores. In case of an attack upon mealies grown for corn, the crop should be harvested as early as possible, and the whole field immediately burnt off. For several subsequent seasons too, it would be inadvisable to plant further crops of mealies in the same lands.

Mooi River Creamery.

WE are informed that the additional capital required by this Creamery has been over-subscribed, and that in the course of a few days the letters of allotment and regret will be posted.

The Creamery is advertising a meeting to be held on the 30th inst., at which, among other business, a proposition will be brought forward for increasing the capital to £12,000.

District Reports.

BULWER, 21st March.—The rainfall for the fortnight ended this day has been a record in this locality. It has rained every day except yesterday. The farmers are beginning to grumble all round of too much wet and want of sunshine for the crops. I regret to have to report that in connection with the outbreak of the lungsickness disease on the farm Coleford that heavy losses are being sustained in the infected troop, and there is reason to believe the disease has been spread to another farm in the upper part of this Division. Horsesickness has made its appearance among Native horses running about the Hlateeni Range; several deaths have been reported. Also, about the Umkomazi Valley I hear several horses have died from the disease. It is evident that as soon as the wet season closes there will be a good deal of horsesickness about the low country, and great care will require to be taken by owners. Sheep-stealing seems to be rife in some parts of the Division, as many farmers complain of heavy losses in this respect. The Public Works Department is now carrying out the additional Government buildings here in connection with the gaoler's quarters and Magistrate's house. I notice brick foundations with cement are being put in. This seems strange, as there is a good freestone quarry on the Township Reserve. Sand has to be specially prepared and brought from a distance of two miles, or from the Umkomaas River, about fifteen miles from Bulwer, to be mixed with the cement, so that it cannot be on the score of economy that brick foundations are being built. All crops in the District look well and promise to be heavy.

H. W. BOAST, Magistrate.

HOWICK, 26th March.—There has been a marked change in the weather during the past three weeks. Since the 1st instant, heavy rains have fallen on 14 days, the total rainfall since that date being 4.49 inches, with the consequence that the rivers and streams are all full, which replenishment was greatly needed to meet the coming winter, the approach of which is manifested by the cold nights. The maximum temperature during the same period was 89degs.

registered on the 4th, and again on the 10th inst., while the minimum was 51degs. registered on three different dates. Hay cutting has commenced in several parts of the District, but has been greatly retarded owing to the incessant wet weather. However the grass is in splendid condition for hay-making, and it is hoped there will be a ready sale for this produce. The mealie crop in most parts of the District is promising exceedingly well, though the farmers are now complaining of the want of sunshine, which is now required to bring this crop to maturity. The potato crops also, in most parts, are looking well, though some crops have suffered from the blight, probably on account of the late rains, and the delay in obtaining fertilizers having protracted the planting. With the exception of the scab in sheep, a few cases of horsesickness, and quarter-evil in calves, the stock is in perfect health, and most of the farmers can still continue to sell a good quantity of milk or butter.

J. W. Cross, Magistrate.

IMPENDHLE, 25th March.—During the past two months good rains have fallen in this District, March being the wettest, more or less rain having fallen nearly every day up to this date. The crops have made good progress, and are looking well, generally, throughout the Division. A case of lungsickness was reported towards the end of last month; the beast was at once killed, and no other case has occurred up to the present. There have been a few cases of horsesickness, otherwise all stock are doing well.

Chas. Boast, Magistrate.

INANDA, 16th March.—The rainfall for February was considerably below the average, being only 2·53 inches; but it was so distributed over the month that crops did not suffer, but rather thrived on it. Mealies are ripening off rapidly, and new ones are coming in, and prices have already receded from 18s. to about 12s. I do not expect with the present demand in the country they are likely to fall much below that for any length of time. Cane is also making marvellous growth, and planters have every reason to feel happy. Grand rains this month; prices high; and crops coming on splendidly; what more could the most exacting want? The tobacco crop has almost all been gathered, and I notice enormous quantities being handled. The crop is evidently a record one, and, I should say, likely to become a drug in the market. It looks very nice, but I am afraid when it comes to smoking, the quality is not what it should be. My old friends know that in my younger days, I was in the tobacco growing business, and therefore know what I am saying when writing of tobacco. Here it is almost entirely, if not quite, in the hands of Indians, and their methods are not such as ever to produce a good smoking tobacco. Speaking of good smoking reminds me that Mr. Starr, of near this township, who has been studying cigar-making for several years, has succeeded in producing a very creditable article; in fact, the best Natal-made cigar I have yet tasted. Cigar smokers could do worse than give them a trial. I may mention that Mr. Starr grows and manipulates his own leaf, and does not trust to the aforementioned Coolie-grown article. Here are a few meteorological observations taken during February last—2·53 inches of rain, which fell on nine days. Heaviest fall 1·10 inches on the 7th. Maximum temperature in the shade, 102 degrees on the 3rd, minimum 61 degrees on the 11th. Mean temperature for the month, 84·2 degrees, which is a remarkably high mean, and mean for its behaviour to us poor mortals here below. I am sorry to have to report two outbreaks of lungsickness in this Division. One amongst cattle belonging to Mr. Gillespie, running on Messrs. Harrison Bros.' land at Avoca. This has been proclaimed an infected area, and the cattle licensed for six weeks, according to law. The other outbreak is reported amongst a Coolie's oxen near Umhloti mouth. The Stock Inspector has gone to investigate, and, if found to be true, the necessary action required by Law will be taken. Both these lots of cattle are said to have come from up-country. Horsesickness is still prevalent, but it has never been bad here this summer. The heaviest looser has been Mr. F. S. Garland; but this is accountable by the fact that he keeps horses and traps for hire, and they are out at all hours of the night. I am very glad to see that planters are taking timely precautions against the bubonic plague, and are having their Coolie barracks thoroughly cleared of all filth and rubbish—at least some of them are, and if there are any who are not, may I respectfully suggest to them to follow the creditable example set by those referred to above. May I also in the same spirit, suggest the same thing to the Verulam Local Board.

John L. Knight, Magistrate.

IXOPO, 26th March.—During the past six weeks splendid rains have fallen and the crops have greatly improved, and in the highland districts the mealie crop promises to be a good one. Forage is also free from rust. There are several magnificent fields of sugar cane, which shows the advisability of cultivating cane for winter feeding. Some millet seed picked last year at rebel farms near the Buffalo River and planted here, has given a heavy crop, and is quite free from rust, and I think farmers would be wise to cultivate it, as it seems to stand the drought better than forage.

Frank E. Foxon, Magistrate.

NEW HANOVER, 25th March.—For the past fortnight heavy rains have been prevalent, which I have no doubt will prove to be a general breaking-up of the season, though many of the farmers are still complaining of the deficiency of rain, and are hoping to have more before the winter sets in in earnest. A decided change is felt in the temperature, the mornings and evenings being cool and pleasant, and we can now look forward to a few months of calm, cool weather, which is certainly refreshing after the excessive heat we have suffered the last few months. The mealie and corn crops are ripening rapidly, and the Natives on the surrounding farms are beginning to hold their weekly beer-

drinks. It is probably on that account Native labour is so scarce. It is a continual grievance about here that the Natives are so undesirous of work. Notwithstanding the drought and locusts in the early part of the season, we can safely say there has not been so successful an agricultural crop for some years; especially can this be said of the crops a little higher up-country. They are looking splendid. Five or six cases of horsesickness have been reported, consequently an early frost is anxiously awaited, the disease being more prevalent here during the months of March and April. Otherwise stock in general is looking well, and are free from disease. Rivers and springs contain more water just now than they have done during the whole of summer.

A. RITTER, Magistrate.

STANGER, 21st March.—During the last week we have had two or three good soaking rains. The young locusts are still very much in evidence. Luckily for tea planters the locust seem to dislike the taste of tea; they also eschew tobacco, and very rarely interfere with mabele and sweet potatoes; hence the crops planted by the Natives in this District consist chiefly of these two articles of food. The weather has been much cooler; in the mornings and evenings a little extra clothing is not out of place. The grass is good and plentiful, the cattle look sleek and well. I have heard of no case of horsesickness within the last fourteen days. I have heard of several cases of dogs being attacked by the maggot or bot fly. In regard to the editorial footnote to my report of March 8th, 1901, I have seen Mr. ——, who states that he placed the maggot or bot on his arm, and saw it penetrate the skin but felt nothing.

A. J. S. MARITZ, Acting Magistrate.

Cattle Reports for 1900.

BY JOHN THORNTON.

THE following are abridged articles from the "Live Stock Journal Almanack" for 1901:—

SHORTHORNS IN 1900.

The changes of fashion in all matters of taste have always accompanied the steps of civilization. Shorthorn breeding has not escaped the varying fancies of the public. In the early part of the century, during the days of the Collings, pure blood was in great demand, and high prices were paid for the best specimens of the Brampton and Ketton herds. Thirty years later the fashion for show specimens began to set in. The Croftons were among the earliest to feed animals specially for exhibition; they were followed in later yars by Messrs. Bates, Booth, Douglas, and Towneley. After the middle of the century, and for the next five-and-twenty years, line-breeding again became the prevailing taste of the day; extreme prices were paid for the finest examples of Bates and Booth blood. During the last quarter of the century we find the show-ring again becoming the leader of fashion, and has continued to the present time. This, doubtless, has arisen from the deterioration of those strictly line-bred specimens where merit has not been studied, as well as from the difficulty many breeders found in mastering lines of pedigree; milking properties had likewise been neglected. There is, however, evidence lately of some demand again for the old pure strains, provided they do not fail in individual merit. The demand from South America for fine specimens of the breed for improving the stock reared on large estancias has led to the very costly purchases during the last season for show-yard animals. The United States and Canada have also latterly gone for show animals, whereas formerly great prices were paid for the purest Bates pedigrees.

DEVONS IN 1900.

The closing year of the century did not witness any remarkable events in connection with the Devon breed of cattle. The shows were fairly well supported, though one would like to see a larger number of new exhibitors, to take the place of those who retire from the arena of friendly competition; one or two herds have been dispersed, when good specimens have commanded good prices. A few animals have been sold for exportation, notably a couple to South Africa, and it is hoped that this may be the beginning of a demand for the breed in our new col-

onies in that part of the world. The chief feature of the past season, as of so many that have gone before, is the firm hold which the breed maintains in its own districts. Competition is keener than it was earlier in the century, when the Quartlys were carring out the work of improvement; but the "Rubies" keep their own, and make a brave defence against all invaders. Whether it be on the North Devon uplands, where the very aristocrats of the bovine race are produced, or in the dairying districts of Somersetshire, where a larger dual-purpose animal is in request, the Devon upholds its supremacy, and fulfils all requirements. The only wonder is that a qualification does not more rapidly extend. The visitors to the great Christmas markets of the metropolis can always find a group of Devon fat steers and heifers, that run the Scotch a close race as favourites of those butchers who have a fashionable trade, and must furnish their customers with the primest of home-fed beef. These perfectly-shaped and finely-finished specimens display the excellence of the breed as butchers' beasts, and supply the prime small joints so highly appreciated. Then, if we take cows of the larger scale, whole dairies of the Devons are to be found in the dairying districts, thus proving the suitability of the breed either for beef or for milk. A breed of cattle possessing such merit for both purposes is bound yet to have a wider recognition. The Devons are well known and esteemed in America and Australia, and it is probable that in the course of the next few years those home breeders who have stuck to them and steadily improved them will meet with the reward that is their due.

Shoes and Shoeing.

THE USE OF SHOES.

THERE are, says Principal Dewar, in the "Transactions" of the Highland Society, comparatively few horses with moderately good hoofs that do not require to have the hoofs shortened at each shoeing. Shoes prevent the natural wear of the hoofs, and paring or dressing of them sufficiently to compensate for the want of that natural wear is required. Some horses wear their hoofs sufficiently with shoes on, but these are generally fast horses, with very free action, doing from twenty to thirty miles a day at a rapid pace.

A great deal of nonsense has been written about making the shoe to fit the foot and not the foot the shoe. As a matter of fact, there are very few feet that do not require to be altered, modified, and guided in regard to their wear and direction. The main tendency of a shod hoof is to grow too long. The shoe is carried forward by the growth of the hoof, and does not bear the same relation to the axis of the limb that it did when applied. The obliquity of the front of the hoof becomes too great. In order to remedy this, as a general rule the wall requires to be more shortened round the toe than elsewhere. So much has been written in the recent past about the evils of the drawing-knife and the mutilation of the hoof that protection of it has often been carried to the other extreme, and hoofs have often been seen at shoeing competitions at our national shows untouched, or only showing an appearance of having been scraped, which really require some dressing to remove the over-grown wall, and prepare a proper level bed for the new shoe.

Dressing the Hoof.

After dirt and loose horn have been removed, the rasp is the proper instrument to run round the anterior edge of the wall to shorten it. But it is very seldom that the drawing-knife is not required. It has often been stated that the sole should not be touched with the knife. This would be correct in the immense majority of cases were the hoofs in their natural con-

dition. But they are not. A rim of iron has been attached to the lower border of the wall, and this rim has prevented the natural wear and exfoliation of the sole from taking place. The shoer ought to be the best judge. The sole ought always to be concave. It ought always, in a natural hoof, to be above the level of the lower border of the wall.

Little else is required. The bars should never be cut away ; scooped out is a more accurate term for the way they are often removed ; and the buttresses between the bulbs of the frog and the heels should be left intact. The frog seldom requires anything but the removal of loose, ragged horn. And last, the heels and whole under-border of the wall should be made as level as possible by the rasp. Before leaving it the foot should be allowed to rest on a level surface, and a front and lateral view of it taken to see whether it seems to bear a proper relation to the limb.

Re-Applying Half-Worn Shoes.

This is perhaps the better place to refer to a custom, more common among the agricultural than the commercial classes, of having half-worn shoes removed and re-applied. They are often more than two-thirds worn. Throughout Scotland the practice is to have calkins and toe-pieces on the shoes of horses used for agricultural purposes. The farmer is to be excused if, when slack time in the work of the farm is approaching, he gives instructions that his horses' shoes are to be removed and put on again. But it is often a "penny wise and pound foolish" method. The horseshoer does not put himself to the same trouble with old shoes that he does with new ones, and the shoes are re-applied unsatisfactorily. Very often the shoes are a little unequally worn—one branch and calkin more worn than the other, often the outside one. The heels of the shoe are heated in the forge, and the calkins turned up afresh without the branches being drawn one bit. The consequence is that the shoe, which ought to have been the proper length before, is now as much shorter as the calkins are higher ; while if one calkin is more worn than the other it is generally due to its being more under the centre of gravity, more under the axis of the limb, and that branch of the shoe is now the shortest, throwing it still more under the centre of gravity than before.

In addition to this, a new toe-piece is often welded on to the top of the old worn one, and the shoe re-applied without due care being taken to observe whether the bearing surface of the hoof bears that relation to the axis of the limb that it ought to do. Depend upon it that if the shoe is unequally worn the hoof will also be unequally worn, and will require to be dressed accordingly. The shoes, as described, are put on well enough, nailed as a rule, but a little more horn is removed at the toes to let the shoes a little further back, as they are rather short at the heels. What is the result ? The horn is raised further from the ground, while he has a more confined base to stand on. His footing is precarious and insecure. The base at the ground is too narrow, too confined, for the height of the column it has to support. This does not harm the hoof so much as might be expected. The harm is more frequently to the limbs. Were the horse used on soft land the risk would be less, as the foot tends to find its own level ; but it often happens, when work on land is not much wanted, that the animal is used — it need not be at hard work — on the road.

Many a horse has shown his first lameness the day after his old shoes have been removed. It may be spavin, it may be sidebones, it may be sprain ; but the evil is a notorious one, and well known to every veterinary surgeon in our agricultural districts. Let the old shoes be utilised by all means if they are worth removing, but do not let them be shortened. If one calkin is excessively worn, remove the cause if possible, draw that branch of the shoe between the calkin and the last nail hole, weld on a calkin or beat down the opposite calkin, dressing the hoof to correspond. But it is a very extreme case that will justify the welding of a toe-piece on to the top of another, and even then it ought to be low and thoroughly beaten down.

Material for Shoes.

Notwithstanding the importance of horse-shoeing, the length of time that has elapsed since it was intrduced, and the many attempts that have been made to find a substitute for iron in making shoes, nothing has yet been found to equal, or even to approach, good malleable iron in the manufacture of horse-shoes. Specially-prepared leather, vulcanite, and compressed paper have been tried, as well as steel and various alloys of aluminium, but good wrought iron is still an easy first. Many attempts have also been made to find some satisfactory means of fastening the shoes to the feet other than by the use of nails, but all have been practically failures. The immensely improved, machine-made nails, ready to be driven, that are so plentiful in the markets now, leave little to be desired, and are not the unmixed evil that nails used to be considered thirty or forty years ago.

In Choosing a Shoe

for a cart-bred colt, the weight and build of the colt should be taken into account. But in any case the shoe ought not to be too heavy at first. It ought to have sufficient iron to wear at least four weeks, and that is easily managed before an animal is trained to stand steady hard work. No shoe ought to remain on more than six weeks without being removed, and very seldom as long as that. As a rule, the flatter the foot, the more slope there is on the hoof, the broader is the bar required to make the shoe. A foot that is comparatively upright is usually pretty concave in the sole, and does not require much cover of shoe, much protection of the sole. A colt, therefore, should be shod with lighter iron than when he is more matured and into regular hard work. And this holds good even if the hoofs have attained their full size. He should also be shod flat. It is a sufficient change for a colt to be shod at all without sticking him on to stilts at once. Machine-made shoes, cheap and fairly good, have been a considerable time in the market, but it is taken for granted that hand-made shoes are to be used.

To Make a Horse Lie Down.

TO make a horse lie down, bend his left fore-leg, and slip a loop over it, so that he cannot get down. Then put a surcingle around the body, and fasten one end of a long strap around the other fore-leg, just above the hoof. Place the other end under the surcingle, so as to keep the strap in the right direction ; take a short hold of it with your right hand ; stand on left side of horse, grasp the bit in the left hand, pull steadily on the strap with right hand, and bear against his shoulder till you cause him to move. As soon as he lifts his weight your pulling will raise the other foot, and he will have to come on his knees. Keep the strap tight in your hand, so that he cannot straighten his leg if he rises up. Hold him in this position and turn his head toward you; bear against his side with your shoulder, with a steady, equal pressure, and in about ten minutes he will lie down, when he will be completely conquered, and you can handle him as you please. Then take off the straps, straighten out his legs, rub him gently about the face and neck ; handle all hiss legs, and after he has lain ten to twenty minutes, let him get up. After a short rest go through the same operation again, and repeat it three or four times. The next day give him two lessons, and the following day two more. By this time he will lie down by taking hold of one foot. When he is well broken this way, tap him on the opposite leg with a stick, when you take hold of his foot, and in a few days he will lie down from the mere motion of the stick.

The most profitable dairy cow is one that has not a tendency to put on flesh, has a good appetite and a large stomach, indicating great consuming and assimilating capacity. A cow with this conformation is said to be of the true dairy type.

Veterinary Departmental Report for January, 1901.

ABSTRACTS FROM DISTRICT REPORTS.

MINISTER OF AGRICULTURE—

I FORWARD herewith at your request a report on the working of the Veterinary Department for the month of January.

An intimate knowledge of the work as carried on by each individual Officer of the Department can only be adequately attained by giving a great part of one's time to the supervision of the detailed duties as performed by each District Veterinary Surgeon and Stock Inspector.

I append the reports as received from the various Officers of the Department.

D.V.S. Hutchinson's report is worthy of notice. I fully endorse his statement that the "large numbers of animals recovering from lungsickness will be a great source of trouble to the Colony in the near future."

While "large numbers of cattle continue to be brought into the Colony from the Transvaal and Orange River Colony, every troop being more of less affected with the disease," there can be no immediate prospect of ridding the Northern Districts of the Colony from the disease. With the advent of cooler weather and the recurrence of more normal conditions, I shall hope to report a decrease of this disease in the Colony north of the Tugela.

D.V.S. Verney reports a case of the disease reappearing in a herd just as the term of quarantine of six weeks was expiring. Such cases emphasise the need so often expressed of imposing a longer period of quarantine upon infected herds.

Glanders is reported from Durban, Hilton Road, and Port Shepstone. Action in each case has been taken, resulting in the condemnation and destruction of the infected animals.

D.V.S. Cordy reports his District as free from scab this month, but the flocks brought into the Colony by the Military Authorities are reported as all being affected with the disease. Prompt action, however, is taken in such cases in dipping and redipping, and so endeavouring to hold the disease in check.

The numbers of cases of redwater occurring in animals driven from the Transvaal and Orange River Colony are interesting as shewing the Districts from whence these cattle were drawn as still free from invasion from the infectious tick.

Isolated cases of horsesickness have occurred throughout the month, but the Colony as a whole has enjoyed a remarkable freedom from the disease, considering its ravages in the Transvaal and elsewhere. An investigation into this disease is now in progress.

During the month, besides the many routine duties of the Laboratory, a bacteriological analysis and report has been furnished on the water supplied to the town of Newcastle. The Laboratory has issued during the month 925 doses of quarter-evil vaccine, 151 tubes of locust fungus, 5 bottles of snake serum, 28 doses mallein, 3 doses of tuberculin.—I have, etc.,

H. WATKINS-PITCHFORD,
P.V. Surgeon.

6th March, 1901.

NEWCASTLE—D.V.S. HUTCHINSON.

Lungsickness.—I am sorry to have to inform you that this disease still remains very prevalent throughout my District (with the exception of the Umsinga Division), and will, I fear, continue to be so, until the introduction of large herds of diseased stock into the Colony is discontinued. Large numbers of cattle continue to be brought into the Colony from the Transvaal and Orange River Colony, every troop being more or less affected with the disease; then again, large numbers of these animals are traded by the Military in exchange for horses, thus forming fresh centres of infection throughout the country north of the Tugela River. Private herds are gradually being brought into a more healthy condition, but several outbreaks are proving very obstinate. This being the case in several instances where the inoculations have taken very severely, and yet failed to

eradicate the disease, and several owners are now drenching their cattle in consequence. Numbers of infected oxen still continue to occupy the different lungsick camps, and the discharging camp at Matowan's Kop is very badly infected. A large proportion of the animals affected with the disease all over my District are recovering, and will, I fear, be a great source of trouble to the Colony in the near future. In many instances owners have lost heavily from the effects of inoculation, no doubt due in a great measure to carelessness in the selection of virus, and aggravated by the excessive heat experienced up-country during the past few weeks.

Scab.—With few exceptions most of the private flocks in this district are now in a cleanly condition.

The large flocks being introduced into the Colony by the Military are all affected with the disease, but these, I am pleased to say, are mostly dipped as they arrive, and numbers have already undergone their second dipping.

Redwater.—A good many cases of this disease have occurred in cattle coming from the Transvaal and Orange River Colony.

Horsesickness.—Only a few isolated cases have occurred up to the present time.

IXOPO—D.V.S. VERNEY.

Lungsickness.—I regret to say that the cattle belonging to Mr. Johnson, Dronk Vlei, have developed this disease just as the six weeks was ending, so he is now under license for a further period. I am sending you a separate report about these cattle.

Glanders.—As requested, I visited Mr. Bunge, Murchison, Port Shepstone, to inspect his horses quarantined as suspicious of glanders. Mr. Bunge possessed two horses (carriage), both showing nasal discharge, enlarged submaxillary lymphatic glands and ulcerated schneiderian membranes. There was a history of an attack of glanders occurring at a Kafir kraal, two miles from Mr. Bunge's house. D.V.S. Byrne treated this outbreak. Considering the circumstances, I did not think it necessary to use mallein, and destroyed the two horses in question. *Post-mortem* examination showed well marked cases of glanders. Mr. Bunge possesses no other horses, so with proper attention to stables and utensils, I hope this will be the end of glanders in this immediate vicinity.

DURBAN—D.V.S. AMOS

Glanders.—Outside Mr. Douglas' stable I have not had another case of glanders during the month.

Tuberculosis.—No cow has reacted to the test of tuberculin during the month, 15 having been tested.

Horsesickness.—None has come under my notice.

Lungsickness.—One farm is still under quarantine restriction.

The importations have been a fair average, as the numbers on attached report will show.

One case of Osteo-porosis came under my notice. This is the second case in the same stable, and Supt. Alexander gave me to understand you personally saw the first case.

Four horses (two fatally) were recently affected with apoplexy owing to the extreme heat, and were the property of the Durban Tram Co.

HOWICK—D.V.S. BYRNE.

Scab.—In Lion's River Division the only case of scab at present existing, to my knowledge, is in a flock of 410 sheep, the property of Mr. F. Curry, on the farm Avondale.

I am sorry to state that Mr. Clarke and his natives had to be placed under a renewed license for lungsickness, another case having occurred. The cattle were again inoculated on the 25th.

In Umgeni Division Money Mahray (Indian), Lillefontein, Thornville Junction, is still under license for lungsickness.

There was one case of glanders. A horse, the property of Mr. E. Tooth, Hilton Road, was taken to Pietermaritzburg to be sold by auction on the Market Square. D.V.S. Woollatt examined the horse and found a cicatrix in the near nostril, so had the horse sent back, and I being away he tested him with mallein, and the horse having reacted was condemned. I visited Mr. E. Tooth at Hilton Road, on January 17th, and saw

the horse destroyed, and on *post-mortem* examination verified D.V.S. Woollatt's diagnosis.

There have been very few cases of horsesickness in my district during this season up to the present.

I had one case of strangles.

GREYTOWN—D.V.S. CORDY.

Scab.—I am pleased to say this District is once more declared free from the disease.

An outbreak of strangles among the horses of Natives on the farm Craigieburn, Western Umvoti Division, occurred during the month.

Bulls and Bull Buyers.

THE *Buenos Ayres Herald* has the following article, no doubt inspired by the criticisms of judges and the public generally at the recent bull sales in the Argentine :—

It must be understood that, when the first perfect bull was made, the mould was broken and the pieces distributed to different pedigree farms. This was done to give room for diversity of opinion, because if that original bull had come out to the River Plate estancieros and majordomos would find no topic to talk about ; of course the importer of the excellent animal would be supposed to know nothing about him. His business is to stand and listen to his merits and faults. He is a dummy who brings the animal here, he bought it with his eyes shut, in fact he does not know whether it is a bull or a bear.

The estanciero and his majordomo are the special intervention of Providence sent to relieve his mind as to the qualities of the animal. When the unfortunate exporter has seen all his bull's faults and his shortcomings, when his form and pedigree have been overhauled, then he abhors the animal, he sees the folly of judgment, he sells him hurriedly and returns to the land of his birth a sadder and richer man.

Now bulls have been known to refuse their food through adverse criticism overheard by them, but in time, like theatrical artists, they get used to it. You see if the bull has got the form in the chest, he lacks it in the shoulder, if he has it in the loins, he lacks it in the quarters ; loins and shoulders allowed perfect, he falls away too much at the tail. Then if the loins, etc. are perfect, he is bound to lack a rib or have one too many. His head is too long, pug nose preferred. His teeth are too hard, or he has an eye-lash too many. Heaven help the bull if his head is any way graceful ! Then he becomes cow-headed. If a black bull has a white tongue his character is ruined for ever. If a red beast has a white breast he won't take the water or drop to gun. Unfortunate is the animal that has a black spot on his pink muzzle ; he is scratched for every race. Probably it may be a splash from the auction clerk's ink pot, no matter, he is no class. Perhaps his mother got frightened by a spotted carriage dog just before he was born ; it is immaterial, his progeny are liable to change these spots (when grazing). He is just as unlucky as the widow Leary's cow that burned Chicago ; if the beast's horn is too long, he is rough and shaggy, if too short, certainly it has been faked.

Man has been known to chew his lip through mortification, and surely some of the sale yard bulls must chew their cud for the same reason when they hear all the mean remarks passed about them. Then the ordinary bull is comparatively happy, as the eyes of the critics are not so strongly on him. But his dreams are often disturbed when some extra special experts punch him up with their umbrellas at all times in the day, and pass him in silent contempt.

If the opinions of all the River Plate judges were melted and cast in a mould to make their model of a bull, there is no doubt but that the icthyosaturus and the Ptagonian Mylodon would have to take a back seat.

Comment is made from time to time on the poor class of Shire horse exported. But is this to be wondered at if the price offered is very small ? High prices in this country do not permit the foreigner to have a very exalted opinion of the Sire horse, if he judges by exported specimens. The Clydesdale, on the other hand, experiences no such demand as the English cart horse ; consequently a better class of horse is exported. That is why the Clydesdale carried off the honours at Chicago.—*The Farmer.*

Farmers' Accounts.

By Arthur Barnett.

IN the issue of the *Journal* of 28th September last, there appeared under this heading the following short article which was taken over from the *Otago Witness*:—

"On different occasions in the past I have referred to the necessity of farmers keeping careful accounts of each year's operations, and of making up a balance sheet at the end of the year. The importance of the subject justifies further remarks, especially at this time of the year, when the agricultural year may be said to have closed and we are in a position to arrive at a correct statement of produce grown and stock bred, and amounts realised for same. June 30, as I have previously said, is the most appropriate time for casting up our accounts and striking a balance sheet showing the profit or loss on our year's work, and also our position regarding assets and liabilities, To those who have not been in the habit of pursuing this desirable course I would say: Begin on the 1st of the coming month and follow the plan as carefully as possible, and if by the same date next year the satisfaction gained and the knowledge afforded do not well repay the trouble involved, then let your affairs slide along in the old haphazard, rule-of-thumb manner. Everybody in business of any kind must keep some sort of accounts, unless, indeed, the receipts are stored in a stocking or tea pot, and all disbursements made in cash from these receptacles. Farmers, as a rule, have a deep-rooted dislike to pen and ink, and hate writing anything but their signature to a receipt for produce sold; but in these days of universal education everybody can read and write and be sufficiently accustomed to the pen to be able to keep their business records. One good reason why farmers should keep accounts is that they may know how they stand year by year, and thus be prevented from getting into Queer-street through a lack of such knowledge. If the farmer operates upon a bank account his pass book will give him an idea of his position, but not a sufficiently accurate one if he is working upon credit, and has a few paper kites flying. When a commercial business changes hands the purchaser requires to know the position of such business in black and white, and verbal information would be scoffed at. So, also, when a farm is to be sold the vendor should be able to give possible buyers an insight into the capabilities of the farm, and prove that it is not a bad egg that he wants to get off his hands. Another reason is that the farmer may know whether he is sound and solvent and not encroaching upon his capital. Stock may pay him well, but grain returns be so bad that the balance is against him. A thorough knowledge of his affairs may also enable a farmer to profit from past experience, and adopt a more economical management in certain directions. Again, if a farmer has to go to Court to recover just debts, how much better he is able to establish his claim if he can show a plain record of the matter in dispute. I think I have given enough good and sufficient reasons why farmers should conduct their business in a methodical and businesslike way."

The foregoing is excellent advice, but to render it practical, a few details are needed describing the best and simplest methods of carrying it out, and these I propose briefly to indicate.

The very best plan, of course, is to employ a trained and competent bookkeeper, whose duty would be primarily

(*a*) to keep accurate record of all cash receipts and expenditure, which should not be entered as received from or paid to different firms or people by name, but which should be credited or debited to the "headings" concerned, as per illustration given at the conclusion of this article.

(*b*) To keep a stock-book, in which should be entered all live stock, wool, mealies, and farm produce, seeds, fertilizers, sheep dip, implements, &c., on hand at time of commencing this system, each under their separate headings; and which should be always kept up to date by the enter-

ing up (on day of receipt) on the "received" or left-hand side of the page all live stock, seeds, and fertilizers bought, foals and calves born, &c., and writing off on the "given out" or right-hand side of the page all goods issued for use or consumption, animals sold, died, &c. (see illustration). This book should have no money columns; it is merely a record of the *number* or *quantity* of live stock, wool, and other assets; not the *value*, which only concerns the half-yearly or yearly balance-sheet.

(*c*) To keep a diary, which should set forth briefly the chief events of the day, such as births and deaths of live stock, sheep dipped, grass burned, work of natives (numbers, how employed, &c.); and particular care should always be taken to enter all future engagements, such as appointments, meetings, bills to be paid, and accounts to be collected, under their proper dates, so that when the diary is opened on that date, the particular engagement is instantly brought to mind.

(*d*) To keep other books, such as an invoice book and day book (both in one), and a ledger, if business be done on credit; the working of these is familiar to all bookkeepers, and need not be enlarged upon.

(*e*) To conduct all correspondence (if desired).

(*f*) To draw up balance-sheets and statements of assets and liabilities periodically.

An efficient man would require fair remuneration, say £10 per month plus board, lodging, &c. The cost of the necessary books and sundries need not exceed £2, and would last from two to three years. There are possibly but few farmers in Natal who would consider themselves justified in going to the expense of employing a man solely to keep their books and accounts; a good bookkeeper, however, is always worth his pay, and if he were intent on making his employer's interests his own, would be able to relieve the farmer of many minor worries, and to prove his usefulness in various ways. Should the desire to do so not speedily manifest itself, an early change would be advisable. A cheap and inefficient man, however willing, would be worse than useless, as accounts improperly kept are misleading, and defeat their own object.

Granting, however, that the employment of a bookkeeper would be too costly for the majority of Natal farmers to undertake at their sole expense, the cost could be greatly modified by the adoption of the co-operative principle, and the sharing of the man's services by, say, three or four farmers living in the same vicinity; or, better still, by the engagement by the local Agricultural Society of a capable man, whose services in the opening and advice on the continuance of a small set of books and accounts would be available to all members. Naturally, it would be impossible for one man to keep the accounts of so large a number himself, but in this case once the books were started, the services of the son or daughter fresh from school, the tutor or the governess (in the latter cases no doubt a little addition to salary would be very acceptable), might be requisitioned, as less detail work would be undertaken than in the previous instance.

The bookkeeper in this case would probably look for higher pay than would be asked by a man whose services were confined to one employer, but he would no doubt be willing on the other hand to act as secretary to the Agricultural Society engaging him, and the members bespeaking his services would be required to repay the Society by way of an increased subscription, or at an agreed rate.

I am aware that farmers, as a rule, have a strong objection to allowing an outsider to have knowledge of their affairs, and more especially would this be so when such outsider would be constantly going in and out amongst their friends and neighbours, and might, if he chose, reveal too much. Such indiscretion would, however, be very foolish on his part, and extremely unlikely, as anything of this sort would be bound in a very short time to lead to the offender's summary dismissal. The same objection might reasonably be made to the employment of bookkeepers in commercial circles, yet we seldom hear of the revelation of one firm's affairs to another firm, even when the bookkeeper transfers his services from the one to the other.

The concluding portion of this article, which will appear in the next issue of the *Journal*, will be devoted to the illustration of a simple set of forms by means of which farmers who elect to keep their own accounts, without outside assistance, may do so with a minimum expenditure of time and labour.

(*To be continued.*)

Dairying in New South Wales.

IN *The Australasian*, "Talpa" writes:—The South Coast District has frequently been described as the "Garden of New South Wales." This term must have been invented by someone who only took the rich bottom lands and its luxuriant vegetation into consideration. At any rate, it is an error to speak of dairying being conducted in a "garden," and this is in reality the most notable feature of the District. No doubt the scenery and wonderful variety of the flora are sufficient to charm all lovers of the picturesque, but it is its cows chiefly, numerous butter factories, and the incessant rattle of milk-cans and cream separators that give the locality a distinctiveness all its own. At every wayside station the handling of milk-cans appears to be the principal occupation of the railway staff, and nearly every cart one meets on the road is filled with cans, some being quite large wagons, drawn by two or more horses. Some of the main roads are good, but others are suggestive of winter obstacles, as I found some of them almost impassable after the heavy rainfall experienced a few days ago. Short lines of light railways appear to me to be the thing required for the outlying districts here, for the farmers find it very difficult indeed to cart their milk over bad roads, and for which reason the "home" separator is growing more and more popular in spite of all damage to the industry the system is said to be responsible for. Where the roads are bad no dairyman can afford to cart whole milk more than three or four miles, and some will not go a greater distance than one or two miles. The home separator has then to be resorted to, unless creaming stations are erected about every mile-post, and experience has taught the farmers that without a complete refrigerating plant the cream from their own separator is equally as good; and, in fact, often better than that obtained at the local creamery. In either case it has all subsequently to be transported to a modern-equipped factory, and where the refrigerating apparatus is wanting the pasteurising process is now generally adopted at local creameries.

The Berry Central Factory.

The Berry Central Butter Factory is one of the best-equipped establishments in the colony. The buildings are situated close to the Berry station, and but for the sign on the wall might be mistaken for railway premises. The situation is handy for receiving supplies of cream from up and down the line, and there are some nine or ten contributing creameries to the Berry Central Factory, besides numerous private suppliers of cream in the immediate neighbourhood. The butter produced here has a very high reputation, Mr. M'Veigh, the manager, having gained more prizes at local, and also in the Royal and Government butter competitions, than any other butter-maker in New South Wales. He is a strong advocate of pasteurising and probably a deal of his success is to be attributed to the adoption of this system. It stands to reason that with so many different suppliers there must always be some milk or cream of doubtful quality, and pasteurising it at 176deg. Fahr. renders the whole more sound and uniform from the butter-maker's point of view. The Berry factory can, at least, afford to pay ½d. per lb. more for pasteurised milk than for unpasteurised, and this

is a considerable item where 100 tons of butter or more are made every month. The October output was 100 tons, while for November it was expected to reach 120 tons, and the December month will total, perhaps, 130 tons. The splendid rainfall, amounting from 7in. to 8in., experienced recently, has assured the South Coast dairymen of an abundant butter season. The pastures were green and fairly luxuriant before this rain fell, and they are now springing up with great vigour. But a very wet spell is not appreciated at all seasons in the swampy coastal country, where you can barely see the backs of the cattle for tall grass. The tussocks, no doubt, form good winter feed, but the pastures would be improved considerably by cutting them down pretty frequently by a sort of paring plough drawn by a bullock team, that I have seen used in some parts of Victoria. Of course the best of the South Coast lands have been drained and laid down to clover and ryegrass, and bear a short sweet herbage. There is ample clover in the paddocks as a rule, but I did come across a single specimen of the strawberry clover, and this plant might be introduced with advantage to the dairy pastures on the Shoalhaven River. I am sure it would grow here all right, as it stands any amount of flooding, and is very fattening to all kinds of stock.

M'Veigh's Milk Test.

The manager of the Berry Central Factory has done more than made a special reputation for butter-making, but he has greatly simplified the method of testing milk or cream. Mr. W. J. M'Veigh may be regarded as the Australian Babcock. His method is simpler and more expeditious than the original system, although the Babcock centrifugal, or whirling machine is still used. The American plan was good enough for butter factories in their infancy, but in the large establishments of this country it was found slow and cumbersome, and taking up too much time, almost as long as churning would do. In Mr. M'Veigh's testing only one minute's whirling of the machine is required, in place of ten by Babcock, one filling instead of three, and the only additional requisite to its adoption on the Babcock machine is a few of the M'Veigh flasks. The process ensures clearer tests, and the finer divisions of the narrower necks allow of more accurate readings. A score of tests can be made in one minute, and the cost of the acid (amyllic alcohol) is about one penny. The only other requirement is a small centimeter pipette, or, in the case of butter factories, a small burette graduated in single centimeters. With the milk and skim milk flasks no compasses are needed, as by releasing the rubber stopper the fat column can be lowered till it touches a main division. Illustrations of Mr. M'Veigh's patent flasks are given in another column, and, while the system has been criticised by certain authorities in the management of butter factories in this colony, I am perfectly satisfied, from demonstrations given at the factory, that it is a very much quicker process of testing than Babcock's original method, and its accuracy has been proved at the Berry establishment beyond all manner of doubt. Mr. M'Veigh has introduced another appliance for the use of dairy farmers in making private tests of individual cows, or for those who do not care to go to the expense of buying a Babcock machine. The centrifugal motion in this instance is gained by slinging the testing flask enclosed in an aluminium case around the head by a string and handle, the same as an acrobat on the stage twists the tumblerful of water upside-down without spilling any on the floor. It is also illustrated in the following pages. The inventor claims that it is as accurate as the present Babcock power machines. It is certainly a novelty, but I have a doubt about many of the South Coast dairymen taking kindly to this sort of exercise for ten or fifteen minutes for the best cow in their meadow. It is not any simpler than the churn, and it might not be so accurate. Its chief advantage seems to be that it gives the fat percentage in the milk, a point which every farmer likes to know who takes milk to a butter factory.

Dairying Returns.

Farmers on the South Coast have either to pay high rents for their land or invest a goodly sum in the freehold. Generally speaking, the rents vary from 15s. to £1 per acre per annum; the price of such land runs from £20 to £40 per acre, a

good deal depending on the situation and facilities for the carriage of produce. The returns obtained by individual farmers from their dairy herds are also very variable, but the general averages are high. The following instances may be quoted as examples of the returns obtained by dairymen in the Shoalhaven district during the past month. From 30 cows, Mr. C. Lamond, of Worragee, separated 2,160lbs of cream, sent to the factory, where 1,088lbs. of butter was manufactured from it, equal to 9lbs. per week per cow. Being paid 9d. per lb. for butter, this farmer realised 6s. 9d. per week for each cow, or £1 7s. in 28 days. From 52 cows, Mr. R. Shepherd, of Bolong, obtained 4,070lbs. of milk, producing 1,803lbs. of butter, equal to a weekly return of 6s. 4½d. per cow. Besides this, Mr. Shepherd churned a considerable quantity of butter for home use. Mr. P. Manning, of Pyree, had still better returns. His 28 cows yielded during the month 28,574lbs. of milk, which produced at the factory 1,108lbs. of butter, which at 9d. per lb. gave a return of 7s. 5d. per week, or £1 9s. 8d. for 28 days. The average return for these three herds for the month is £1 7s. 5d. per cow. Generally speaking, the all-round returns from a dairy herd on the South Coast is £12 per cow per year, and they get little or no feed except pasture

Selling Cattle by Live Weight.

AS you are doubtless well aware (writes the subscribed to *The Farmer*), I have long taken an active part in trying to establish in this country the up-to-date system that prevails in America of selling cattle at a price per cwt.—or 100lb. (cental) as the case may be—live weight. I have also, in season and out of season, advocated the use of the weighbridge as a means of accurately ascertaining the value of cattle. It was a most singular and suggestive fact that farmers would not sell hay, potatoes, or any other farm produce worth, say, £4 per ton, without having it accurately weighed, or measured, while they are content to go on selling their cattle, which, in many cases, were worth £40 per ton, live weight, by the haphazard, and altogether inaccurate, system of guess-work. But, as the result of my exertions, and those of the late Mr. Wesley Richards, a great change has been brought about in the opinions and practice of British and Irish farmers in this respect. In 1887 the Government passed the Markets and Fairs (Weighing of Cattle) Act, which decrees that at every market and at every auction mart at which cattle are sold there shall be erected a suitable weighbridge, by way of giving facilities for farmers having their cattle weighed ; and, as a matter of fact, the great majority of fat cattle now sold at the auction marts in Scotland are weighed on the weighbridge, and their weights recorded either on a blackboard by the weigher, or by the finger of a dial, in presence of all the spectators, just before the animals enter the auction ring. To my certain knowledge, also, the stock-feeders—particularly in Scotland—now pay particular attention to the weighing of cattle as a means of accurately ascertaining the value of their cattle ; and, as a matter of fact, they rarely, if ever, when referring to the price of cattle, quote prices except by the live weight cwt. It has been a matter of great satisfaction to me to see this accurate and scientific system of estimating the value of cattle gradually replacing the old, inaccurate, unscientific, and purely haphazard system of guess-work which formerly prevailed. My interest in this matter is entirely disinterested, for I am not in the remotest degree interested in the making or selling of weighbridges ; and, although an occupying proprietor on a small scale, I am not in any way dependent on farming. My object in taking up the weighbridge matter has simply been to help the farmers by showing them how to buy their store stock and sell their fat cattle on a rational and scientific basis. When, therefore, Major Tennant, the assistant secretary of the Board of Agriculture, stated in his last annual report that "There is certainly no evidence to

show that the principle of estimating the value of a live animal by means of the scales is one that has as yet secured much public favour," I felt called upon to test the accuracy or inaccuracy of his statement on the subject, and for that purpose I wrote to a large number of leading farmers in Scotland, and other parts of the kingdom, asking for an expression of their views on this question. The accompanying pamphlet is, for the most part, made up of letters I have received from the best-known stockowners in the country, all of whom testify, in the strongest terms, to the advantages which they have derived from the use of the weighbridge in accurately ascertaining the value of their cattle. The pamphlet is not for sale, but several hundred copies have already been circulated, and any of your agricultural readers who are interested in the question can have a copy sent to them on application to me —

JOHN D. M'JANNET.

Woodlands, Stirling,
January 17th, 1901.

The pamphlet, which contains twenty-four pages, is full of interesting reading. The testimony is chiefly that of practical farmers, who, having tried the system, relate their experience. These include many of the most noted breeders and feeders in Scotland, and several in the North of England, while an emphatic American opinion is given.

Co-operative Banking in Hungary.

THE following, sent by a correspondent, is extracted from the *Manchester Guardian* :—The progress of co-operation among the *small farmers* of Hungary is among the most marvellous signs of the advantages which have been derived from this method of action by the agriculturists of the Continent. Formerly these people were largely in the hands of the usurer, and in consequence their condition was lamentable in the extreme. It was not until 1879 that any attempt was made to deal with the difficulty, but between that period and 1894 a great stride was made, for not only were associations established, but in the five years preceeding 1894 they progressed with marvellous rapidity. The members increased by 250 per cent., the reserve fund increased by 800 per cent., the number of savings banks increased almost in the same ratio, the sums borrowed under two separate conditions - by notes of hand and under contract—increased by 400 and 800 per cent., while the profits increased by 500 per cent. These facts show how enormously the movement had encouraged saving on the part of the people. In the year 1894 the sum borrowed averaged 122 florins per member, as against 60 florins in 1889 ; but even this large sum was augmented by the fact that "social capital," as it is termed, was borrowed at the rate of 160 florins per member, as against 80 florins borrowed in 1889. The money in the savings banks represented 57 florins per member, as against 12, while the "social capital" was raised from 19 to 37 florins. In the year 1894 the Central Credit Institution of the National Co-operative Association was established, and development became still more rapid, the number of societies increasing from 54 in 1889 to 379 in 1897. In the last-named year 6½ million florins were borrowed for the Central Institution, 2¼ million florins were deposited in the savings bank, and 203,000 florins were actual profit. In 1895 225 bureaus, representing one or more associations, were created ; in 1896 there were 267 such establishments, and in 1897 there were 361 ; in the following year (1898), of which full details are not obtainable, the number during the first six months was 160. In the year 1898 a Mutual Credit Co-operative Society was established for the kingdom by law, with the result that in the following year 712 bureaus, representing new and old societies, were affiliated, these representing 135,000 members and 14½ million crowns in capital. It is amazing that with such facts before us, and with a knowledge that co-operation is spreading in practically every Continental nation, we in England do not take steps of a simila[r]

character. It is assuredly not because there are no leaders or because there are not men in almost all ranks who are willing to help in the work. The Association of which Mr. Yerburgh, the member for Chester, is now at the head has commenced to work on this line. It will, no doubt, find many helpers; for, whatever may be the view of agriculturists at large, the time is coming when the salvation of the industry by means of which they live, and which is essential to the interests of the country, will need all the self-help which is at their command. The action of successive Governments has shown that we have little to expect from Parliamentary aid; in the main this is due to the apathy of agriculturists themselves, but it is not unnatural to suppose that it is very largely owing to the growing increase in the numbers of our people who are not engaged in agriculture, whose sympathy is not with the maintenance of prices, but rather with the importation of cheap foods, which are so essential for the vast majority of our population. Agriculture, then, will have to take care of itself, and this means that it can only be strong enough to look after its own interests when its members work together, and this they can only do through some form of combination.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 1st May :—

Candella.—Bay horse, about 14 hands 2 inches, six-year-old, flea bitten all over, branded J.N. on right hind leg, little white star on forehead. tail cut short, rather low condition.

Howick.—Black ox (bull stag), horn points cut off, branded P.O. on right hip.

Ladysmith.—On the farm Drie Hoek, of Mr. J. H. Newton, grey mare, branded on right leg, indistinct. It appears to have had a broken hind joint, a long tail and mane. Red Africander cow, branded on left leg D.U., lame with left hind foot.

Ndwedwe.—On the farm of Madigana, a native, upstanding bay gelding, about 15 hands high, long square-cut tail, black points, heavy mane and tail, small part of mane white, leather ticket, plated, on tail, bearing number, branded on left hoof 6823, probably belongs to the Military.

Highbury.—Black-and-white he goat, aged.

Woodend.—Black filly yearling, star on forehead, brown nose, no brand.

Harding.—Bay pony (gelding), about 13.3 hands, four years old, black points, marks of sore back, long tail, no brand.

Nqutu.—One sheep (ewe). Red cow and calf, branded TM right hip. Bay gelding, no marks or brand, age about two years.

Colenso.—13 half-bred Angora goats, wethers. 26 half-bred Angora goats, ewes. 3 black-and-white kafir goats, ewes. 3 black kafir goats, ewes. 3 brown kafir goats, ewes. 2 grey kafir goats, ewes. All with ears slit; no other marks. And one wether and two ewe sheep, no brands.

In connection with the advances to dairy factories approved at the meeting of the Meat and Dairy Board last week, it might be mentioned that the amount up to which advances were made, in the case of Mr. Sealey's condensed milk factory at Trelawny, was £1,400, and the case of the Queensland Farmers' Co-operative Dairy Company, £1,200.—*Queenslander.*

When Arthur Young visited the county Tyrone in 1776 there was scarcely a wheeled cart in the country, all the peasants using sleds, which could be had for about half-a-crown as against the 35s. which a wheel car cost. In tne county Cavan he was astonished to find that the people "very commonly plough and harrow with their horses drawing by the tail; it is done every season." The people insisted that when the horses were tired from collar work all that was needful to rest them was to strip off their harness and make the plough or harrow fast to their tail. This, remarks Young, is no jest, but "cruel, barbarous truth." The same practise was in vogue in the Western islands of Scotland later than 1776.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inanda & Ndwedwe	Lungsickness	Versamy ...	Bellament.
		,,	H. Gillespie ...	Avoca.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein.
		,,	P. Boshoff ...	Smalldeel.
		,,	J. F. Maritz ...	Springbank.
		Lungsickness	J. T. Howell ..	Doornkop.
		,,	Joeisa ...	Klipfontein.
		,,	Toonyani ...	Chieveley.
J. Button ...	Estcourt, South of Bushman's River	,,	J. Mattison ...	Klipstone.
		Scab	C. P. F. Marais ...	Stockton.
		,,	H. E. Kirby ...	Klipfontein.
A. H. Ball ...	Weenen ...	,,	C. P. F. Van Rooyen	Mona.
		,,	G. R. Van Rooyen	Vitooria.
		,,	R. J. J. Van Rooyen	Bird Spruit.
		Lungsickness	Various	Weenen T'Lands.
		,,	Jogozalah ...	Woodford.
		,,	A. B. Bell ...	,,
		,,	Kamela and Kuhlawomhlaba	Inkasene.
		,,	Secwa... ...	Baviaan's Krantz.
J. J. Hodson ...	Lion's River ...	Scab	F. Curry ...	Avondale.
		,,	Jas. King ...	Lyndoch.
		,,	Jas. Morton ...	Tweedie Hall.
		,,	H. Steadman ...	Woodlands.
		,,	C. Strapp ...	Oatlands.
		,,	G. Woodhouse ...	Halliwell.
		Lungsickness	A. Clark & Natives	Mount Ashley.
E. J. B. Hosking ...	Upper Umkomanzi	,,	H. Gillespie ...	Intimbankulu.
		,,	Native ...	Stirtreimfontein.
		,,	Turnbull & Co. ...	Glen Islay.
R. J. Raw ...	Impendhle ...	Scab	H. J. Martens ...	Wuthering Heights.
		,,	T. Flemming ...	Good Hope.
		,,	H. Phipson ...	Boschberg.
		,,	G. Q. Hamilton ...	Ivanhoe.
		,,	J. W. Brooke ...	Impendhle Store.
		Lungsickness	Crossley Bros. ...	Deepdale.
W. Wilson ...	Polela	,,	H. Eaglestone ..	Coleford and The Bungalow.
C. E. Hancock ...	Ixopo ...	,,	J. H. Johnson and Natives	Dronk Vlei.
		Scab	Native Pietman ...	Wesley.
		,,	H. W. Chick ...	New Garrett.
		,,	C. Green ...	Gorton.
		,,	C. L. Hammond ...	Sunrise.
		,,	W. K. Anderson...	Maxwell.
		,,	J. Anderson ...	Lilliedale.
		,,	E. S. Clarke ...	Carr End.
		,,	Malambula ...	Location.
		,,	Budoza ...	Hlogozi.
		,,	Zinisani ...	Klipgat.
		,,	Solibamba ...	Lufafa.
A. J. Marshall .. (Acting)	Newcastle	Lungsickness	W. Dicks ...	Lennoxton.
		,,	A. A. Osborn ...	The Mount.
		,,	O. Schwikard ...	Boscobelli.
		,,	Loxton & Rudd ...	Waterfall.
		,,	Native Shallos ..	River View, Ingogo.
		,,	H. P. Beare ...	Glen Hesit, Ingogo.
		,,	G. L. Fraser ...	Ingogo.
		,,	J. F. Grant ...	Hilldrop.
		,,	H. S. Dicks & Sons	The Retreat
		,,	Native Funwayo...	Tigerkloof.
		,,	W. Bower ...	Brampton.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ... (Acting)	Newcastle ...	Lungsickness	Umbobo & Lugudu	The Garden
		,,	Velli, Finhlo ...	Leister.
		,,	W. Read ...	Newcastle.
		,,	Umgallas and Behleimpy	Rooi Point.
		,,	Umgodini ...	J. Adendorff's farm Ingagane.
		,,	Kotshaindoda ...	N. Dugenaar's farm, Ingagane.
		,,	J. W. O'Reilly, Natives Jonas, and Paplana	Newcastle T'Lands.
		..	L. H. S. Jones ...	,,
		,,	Crowe Bros. and Roberts	,,
		..	J. Hodgson ...	Belvedere.
		..	Kaffula ...	Boschhoek.
		..	Bob. Salugwanda	,,
		..	A. Nottman ...	,,
		..	P L. Uys ..	Jackalspan.
		.	T. Breary ...	Newcastle Colliery.
			J. Davidson ...	Lennoxton.
		..	A. Danks ...	Crown Colliery. Newcastle.
		..	Beckeroo ...	Lennoxton.
		..	J. Smith ...	,,
		..	-- Sheikamier ..	Newcastle.
		.	J. J. Exsteen ...	Manning.
		..	A. Paine ...	Mount Prospect
		..	F. W. Hatley ...	,,
		.	E. Parker ...	,,
		..	A. F. Ross ..	Newcastle.
		..	Ramsaroop ...	,,
		..	G. J. Way	Vrede.
		..	Unjopal & Eseresing	Newcastle.
		.	A. H. Tatham ...	,,
		..	J. W. James ...	,,
		..	G. Brown ...	Wykom.
		..	Macdonald & Kemp	Lennoxton.
		..	Natives ...	Whykombe.
		,,	,, ...	Droog Plaats.
		Scab	C. de Wet ..	Schuinshoogte.
		.	W. Adendorff ...	Hope Farm.
		..	H. S. Dicks ...	Lennoxton.
		..	J. Wessels ...	Wykom.
		,,	A. J. Middleton ..	Ingogo.
		..	W. E. Few ..	,,
		..	F. Johnstone ...	Craig.
		,,	Umkwenesi ...	Alcock's Spruit.
		..	J. Dicks ...	Vet Klip.
		,,	F. R. Tewson ...	Rooi Point.
		,,	W. A. Lang ...	La Belle Esperance.
		,	J. Vanderwesthuise	Hartebeestelaagte.
		..	— Hamilton ...	Eagles Cliff.
		..	— Worthington ...	,,
		,,	W. C. F. Napier ...	,,
		,,	J. A. Vanderplank	,,
		,,	A. P. de Jager ...	One Tree Hill.
		,,	G. J. Way ...	Vrede.
A. S. Parkinson ...	New Hanover ...	Lungsickness	E. Bentley ...	York.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	T. Dawson ...	Zwartkop.
			J. Thompson ...	Gaol.
		,,	T. J. St. George...	Burger St., PMBurg
		,,	F. S. Tatham ...	Pine St., ,,
		,,	W. S. Shepstone ...	Loop St., ,,
W. Wright ...	Klip River	,,	T. Ellison, G. Cowan, and G. E. Robinson	Ladysmith Town Lands.
		,,	Discharged Transport Cattle	Matowan's Kop.
		,,	W. J. Tully ...	Grobelar's Kloof.
		Scab	Loot Sheep ...	Van Renen's Pass.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	— Spence ...	Reunion Estate.
W. Freer ...	Upper Tugela ...	,,	J. W. Coventry ..	Rangeworthy.
		,,	D. Munger ...	Bedale.
		,,	Mr. and Mrs. C. C. J. Bester	Bester's Hoek.
		,,	W. Freer ...	Acton Homes.
		,,	G. Von Beneker...	Drill.
		,,	H. H. Reed ..	Mains.
		,,	W. O. Coventry ...	Acton Homes.
		,,	H. Francis ...	Bedale.
		,,	G. Spearman ...	,,
		,,	G. H. H. Coventry and Native	Rangeworthy.
		,,	G Spearman ...	Spion Kop.
		,,	F. Zunkel ...	Klein Waterfall.
		,,	T. H. Creevin ...	,,
		,,	Dr. Jones ...	,,
		,,	D. G. Giles ...	Upper Tugela Magistracy.
		,,	J. Reed ...	Roode Bent.
		Scab	J. Scheepers ...	Sand Drift.
		,,	C. Crawley ...	Waterloo.
G. Gielink ...	Zululand ...	Lungsickness	M. Titlestad ...	Ntingwe.
		,,	Dinizulu ...	Hlabisa District.
		,,	Noiwana ..	Nqutu.
A. Klingenberg ...	Umsinga ...	,,	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
		,,	Combrink Bros. ...	Uithoek.
		,,	Mrs. H. Strydom...	,,
R. Marshall ..	Dundee ...	,,	Marshall Bros. ...	Cleveland.
		,,	— Dammann ...	Celle.
		,,	— Frockling ...	Henning.
		,,	W. Muller and C. Hellberg	Karlsburse.
		,,	— Schroeder ...	Schroeder's Hope.
		,,	do. ...	Rosenen.
		,,	— Haynes ...	Sterkstroom.
		,,	Military Authorities	Maypole.
		,,	A. F. Henderson...	Brazil.
		,,	— Stoffel ...	,,
		,,	— Ohlsen ...	Craigside.
		,,	Umquayo ...	Sweet Home.
		Scab	— Hearn ...	Hatting Spruit.
		,,	J. W. Marshall ...	East Lynn.
		,,	— Ohlsen ...	,,
		,,	D. Meumann ...	Dundee.
		,,	A. & P. Conyers ...	Rest.
		,,	Natives Sheep' ...	Maypole.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
W. A. Hutchinson	Alfred ...	Scab	G. Whitelaw ...	Deemount.
		"	W. Stafford ...	Sutherland.
		"	Nqubu ...	Location.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	Faku ...	Mount Alice.
		"	A. C. Beyers & Sons	Doveton.
		"	A. P. Vandermerwe	Poortje.
		Scab	J. R. Vandermerwe	Noodhulp.
E. Varty ...	Umvoti—Western Portion	"	T. J. & C. M. Botha	Welverdient.
B. C. Shooter ...	Alexandra ...	Lungsickness	H. Reynolds ...	Inyangweni.
		"	Umjanie ...	Pasture.
G. N. Perfect ...	Umvoti—Eastern Portion	Scab	L. J. Nel ...	Welgegund.
		"	J. A. Nel ...	"

The whole of that portion of the Colony north of the Tugela River has been proclaimed by the Governor an infected area under the Lungsickness Act.

M. J. HIME,
for P. V. Surgeon.

Principal Veterinary Surgeon's Office,
27th March, 1901.

The Utilisation of Corn Stalks.

IT has probably never occurred to the farmer who has been throwing corn stalks away as waste for ages that these would ever be put to profitable use. Nevertheless, such is the case, as will be demonstrated upon the completion of the third cellulose plant in the United States, and the second largest in the world, now being constructed at Linden, Indiana. Over £20,000 has been expended in the mechanical equipment, and when in full operation the plant will employ 100 men. Then the apparently useless corn pith will be put on the market as a protection for battleships of all nations, as a smokeless powder, dynamite, and other high explosives; as varnish, kodak films, car-box packing filler, waterproof cloth, linoleum, fine art paper, imitation silk, patent leather finish, face powder, silicate packing, and endless other, as various forms of which the farmer, or even a more scientifically inclined person never dared to dream.

The plant now in construction at Linden includes all of the plant which has been operated at Rockville, Ill., to which has been added enough to make the new twice as large as the old concern. Both of the other plants in the United States are owned by the same concern—namely, the Marsden Co., a fifty-million dollar Philadelphia syndicate, which controls all the patents covering the processes. They are located at Owensborough, Ky., and West Point, Va. The former plant will probably be erected this year at Peoria, Ill. It is estmated that over 16,000,000 tons of corn stalks have annually been going to waste, and the successful attempts of this trust to rescue this waste makes stalks worth 12s. 6d. per ton, and thus in the next twenty years will increase the income of farms £5,000,000 by producing cellulose, dynamite, glue, cardboard, paper, and many other saleable products. In this may be found an extenuating argument in favour of one

trust at least. Eighty million acres comprise the annual average of corn area in the United States, each acre yielding an average of about 4,000lbs. of cornstalks, or a total of 160,000,000 tons. Of this weight 85 per cent., or 136,000,000 tons, is valued as feed, but not over ten per cent. of it is actually fed. The other 15 per cent. of the total weight, or 24,000,000 tons, is the pith of the stalk, which has been a total waste. The patents held by the Marsden Co. cover the process of separating the pith from the stalk, which makes it not only possible, but profitable for them to pay 12s. 6d. per ton for the stalk, and produce the raw material, worth 8½d. per pound, or £70 per ton. If every ton of stalks in the United States could be handled, the value of each corn crop would be increased £100,000,000. The proprietors of the Marsden Co. expect to see the time when these conditions will exist.

As for the products of this once useless corn pith, the outer lining, that part that encloses the pith, will be made into flour as an adulterant, cattle feed, chicken fattener, and egg-producer. Part of it will be made up into candy, into colouring dyes, and still other elements will become a part of more novel productions. Thousands of dollars will be added to the crop receipts of Indiana farmers. That which has been waste will be consumed, and employment will be furnished for skilled workers.—The "Foreign Buyer."

Industrial Australia.

THE HON. F. R. MOOR'S IMPRESSIONS.

(*Published by order*).

TAKING advantage of my recent visit to Australia to see as much of the country and its industries as my limited stay afforded, I have now the pleasure of submitting the impressions I received, in the hope that they may be of use to my fellow-colonists.

The present highly industrial condition of the Australian States is in a great measure attributable to the lessons taught by the serious financial crisis of a few years ago, when the banks failed, and when the people (with their country on the verge of ruin), realizing that its regeneration could only be effected by developing its resources, set to work, by means of co-operation and Government aid, to establish the various works and factories which have placed the several industries of that country in their present advanced and prosperous state. The crisis furnished the people with the incentive, while the refrigerating chamber furnished them with the means of placing their perishable products on the markets of the world.

In almost every instance the large factories now to be found in Australia are traceable to some small concern erected by a few farmers and others, acting on the co-operative principle, or have arisen out of modest ventures undertaken solely by individuals, or by States, and Municipalities. One of the most notable examples of this wonderful development was furnished in the case of the Government Freezing and Export Works in Melbourne, which was started by the civic authorities a few years ago, to enable business people and others to store their perishable products. The original premises, which still form part of the works, are so small, that it might safely be said they could be "stowed away" in one of the many refrigerating chambers of the present building, and the expansion of the trade caused by the erection of these premises now enables the Government to employ an efficient staff to inspect and prepare perishable products for market or export at a minimum cost, while the institution is self-supporting. In every suitable locality freezing and chilling works and factories are to be found, and as an instance of the magnitude of the operations of some of these works, I might mention that in one of these establishments alone 56,000 bullocks were dealt

with last year. The creation of these factories is almost invariably productive of prosperity in the surrounding districts, with concurrent industrial developments which cannot fail to benefit the entire community. The keynote of all these institutions is economy, and the fullest use is made of every particle of the animals slaughtered at the factory to which I have referred, even the blood being saved and converted, with the bones, into manure, a ready sale for which was found, the price being £4 10s. per ton in Brisbane. Beef at this establishment was obtainable for 2¾d. per lb., and I was informed that it could be landed in South Africa for an additional 1d. per lb. Creameries and butter and cheese factories are especially numerous, and the flourishing condition of the Australian dairyman to-day is unquestionably attributable to their creation. In one of the butter factories which I visited — by no means one of the largest — the output of butter last year was over 900 tons.

Labour, Machinery, and Land.

Labour is scarce and dear, and I was much impressed with the numerous contrivances and methods adopted in all the industries and factories, and on estates, farms, and even in the home, for saving it. The introduction of the best labour-saving machinery in the world has been resorted to, and has resulted in supplanting hand labour; enormously increasing production, and reducing cost, thereby stimulating demand. This, again, has re-acted on the land, which is rapidly rising in value, and from which all this wealth is derived. Dairy and other farms within reasonable distance of railway communication near centres bring from £10 to £40 per acre, according to fertility, and this state of things has been brought about in face of the fact that unskilled labour has been fixed by law at a minimum wage of 7s. per diem of eight hours' work.

Dairying.

Dairying is still rapidly progressing in Australia, and several of the large pastoral estates in Victoria and elsewhere have recently been cut up into suitable allotments for lease or sale to small holders for dairy purposes. Where the land is leased the lessor agrees to supply the lessee with a given number of cows, which number the tenant must maintain, and the product thereof is divided between the parties according to their agreement. The lessor in such cases usually provides all necessary yards, outbuildings, and dwelling-house for his tenant. When rented for cash, one pound per acre per annum is usually paid for land suitable for grazing dairy cattle. The most successful amongst the dairymen are generally those with large families, who assist in the work. The cream is usually separated on the farm, and sent to the factory, while in other cases small central creameries are formed to deal with the milk. The great advantage of these factories is that the appliances at their disposal enable them to produce butter of uniform good quality, which always commands a ready sale, and ensures a steady market. The advance in dairying has been so marked during the past few years that even the most sanguine could never have anticipated its present flourishing condition.

Stock.

The cost of land in close proximity to business centres or the lines of railway is bringing about a division of labour in regard to the raising and fattening of stock, as the breeders cannot acquire the large areas necessary for their purpose near enough to a market to enable them to deliver their cattle or sheep in prime condition, and they are thus compelled to sell their "stores" to men holding fattening areas in touch with the factories or butchers. This fattening appears to be a very lucrative industry, and is attended with mutual advantage to both breeder and grazier.

Concurrently with dairying, and as an adjunct thereto, has arisen the breeding of pigs, which I was informed was one of the most remunerative occupations of the farmer. As in the case of cattle and sheep, the introduction of the factory has given a tremendous impetus to this industry, one factory alone, in Queensland, having dealt with 65,000 pigs last year. This factory, in common with many others, had a very small beginning, the reason being that the farmer had to be

educated up to the fact that it was to his interest to breed the pigs, and leave the manufacture of the bacon to experts, equipped with every facility and modern appliance necessary for the handling of the product. The age at which it is found most profitable to market the pigs is about eight months, by which time a good Berkshire, which is the favourite breed in Australia, weighs from 80 to 120 pounds, cleaned, and realizes from 35s. to 45s. to the farmer. Within six months from the starting of this factory the Queensland markets were swept of the imported article, and a considerable export trade developed, the quality of the manufactures holding their own with English and American supplies. Pigs are now extensively raised throughout the Australian Colonies, and are purchased on the farms by the factories' buyers, who arrange with the farmers for delivering at a convenient station on a given date, after a sufficiently large number of animals have been obtained to fill one or more trucks. The pigs on arrival at the factory are allowed time in which to recover their normal condition, preparatory to slaughter. It was especially interesting to learn that, at the factory to which I have referred, the bye-products, such as lard, trotters, tubes, bladders, have covered the factory's charges, the main products representing the farmers' portion. Three items are regarded as essential to success, viz., cleanliness, which should be secured by means of styes properly constructed and kept; systematic feeding, and marketing the animals as soon as they are ready for the factory.

Agriculture.

The agricultural development of the country, so far as I was enabled to judge, does not appear to be very much in advance of our own standard, where our farmer realizes the necessity of assisting nature by artificial means. In one direction, however, we in Natal could follow, with very great advantage, the example set in Australia, and that is by establishing a Government Agricultural College. A visit to one of the largest of these colleges, the Hawksbury, in New South Wales, convinced me of the practical utility and far-reaching influence of these institutions when properly conducted.

At the college named the students, who number 120, are put through every branch of farming in a thoroughly practical and scientific manner, each branch being conducted separately, under the supervision of a practical man. On entering on their course the boys are taught the ordinary routine of farm work, and the value of employing the best labour-saving machines procurable. Every phase of the work is attended with appropriate lectures as it proceeds, the pupils being taught to analyse the soils and manure used, study the character and requirements of the crops, and learn how to distinguish and combat the diseases to which they are subject. The students have their own equipment for examining, testing, &c., and must work out for themselves the information they seek to acquire, the result of their investigations being subsequently checked, and if necessary corrected and explained by the professor concerned. The same practical training is followed in the stock paddocks, dairies, piggeries, poultry yards, apiaries, and orchards, and in addition the pupils are made to acquire a useful knowledge of carpentering, building, and smithy work, a knowledge which enables the student on leaving the college to build his house, shoe his horses, or repair his implements. Most important amongst the lessons the pupils are taught at this establishment is the method of keeping proper accounts, and assigning to each branch of their work the profit or loss occasioned thereby. These accounts are made up weekly, and with great exactitude.

The practical and scientific knowledge of all farming subjects thus obtained, coupled with method, accuracy, and handiwork, cannot fail to be of untold benefit to the pupils and the country. The pupils perform *all* the work connected with their calling, servants only being employed for purely domestic duties, and this should be insisted on in any establishment started in our Colony.

While in Adelaide I inspected the large farm acquired by the municipal

authorities for the disposal of the city's sewage, and was greatly impressed with its utility, apart from the fact that it was paying its way. The farm, which is 500 acres in extent, is connected with the sewage canal at a convenient point, from which the water can be distributed over the entire area, the solids being intercepted at this point by means of screens, and removed for treatment, after which they are sold, or used on the farm itself. The whole work is carried on with a wonderful freedom from unpleasantness, and furnishes a very instructive lesson as to the disposal of sewage. This farm is entirely devoted to pastures, chiefly exotic grasses and lucerne, and the number of stock it carries is surprising. Two paddocks of fifty acres each carry one hundred cows between them throughout the year, and another paddock of sixteen acres carried twenty horses annually. The price paid by the owners for running the cows (best dairy cattle), was £5 per head per annum, and 5s. each per week was paid for the horses, which chiefly consisted of overworked animals sent out to recuperate.

Fruit.

Fruit growing is largely carried on in several of the States, usually in conjunction with one of the other branches of farming, and numbers of very fine orchards are to be seen. The points to which Australian fruit growers attach paramount importance are the selcetion of good trees, constant cultivation and destruction of weeds, careful pruning, spraying at the proper times for combating disease and insect pests, regular gathering and destruction of unsound fruit, and careful packing and grading of produce for the market or factory.

Coal.

As this product is one of considerable importance to Natal, it occurred to me that the following information which I acquired in New South Wales pertaining to the industry may be of value, viz. :— That although under normal conditions the coal is mined by white labour, the mines, notwithstanding this dear labour, not only supply local requirements, which are great, at very low rates, but have developed a large export trade, the article being put on board steamers in Sydney Harbour at 9s. 6d. per ton, trimmed, the price at the pit's mouth being about 5s. 6d. to 6s. per ton under normal conditions. Prices at present are higher, on account of the war, the average being about 11s. to 12s., trimmed, on board in Sydney Harbour. A shaft is at the present time being sunk in Sydney Harbour itself, to enable the working of a seam which has been found at a depth of about 3,000 feet, by means of the diamond drill.

Timber.

The Australians are very fortunate in having an almost inexhaustible supply of timber, some of which is amongst the most valuable in the world. In Queensland I was informed that over 300 varieties of Eucalypti had been catalogued and classified, but, of course, the greater proportion of these were of little or no value for commercial purposes, the valuable varieties being comparatively few. I was also informed that it is a characteristic of the Eucalypti that the different varieties grow on different soils, and this is so distinguished a feature that an Australian is able to sufficiently describe the nature and condition of the soil and geological formation by giving the names of the gum trees growing thereon. In view of this characteristic we should therefore get whatever advice is obtainable respecting the soils and situations suitable to the different varieties of these trees from Australian colonists before planting largely. Mr. Maiden, the director of the Botanical Gardens in Sydney, has kindly promised to assist our Government in any enquiries it may wish to make in this direction.

Through the kind assistance of the gentleman referred to I was also able to secure a small quantity of seed of several of the most valuable timbers, which has been handed over to the Agricultural Department for distribution. On several occasions my informant expressed regret that we had introduced the Tasmanian Blue Gum (which is regarded as one of the most useless of the Australian woods) into our Colony, a mistake which they said had also been made by some of the European countries. I am strongly of opinion that the Eucalypti will succeed as well in

Natal, if not better, than they do in Australia, the species we have here being quite as vigorous in growth as any I saw in their native country. The Acacia Mollissima, for instance, succeeds much better here than in Australia, from which country it was introduced, and I am fully satisfied that if timber growing is properly taken up in this Colony, we should, within a measurable time, be able to supply all our own requirements. Reliable seeds of the Jarrah and Karri woods — which woods are imported largely into Natal — were not procurable before I left Australia, but arrangements were made for securing a supply, which was to be forwarded on the first opportunity. These woods are largely used in West Australia, the Jarrah for immersion in water and underground work, and the Karri for superstructure. This is very important, and should be borne in mind.

The foregoing information, to be of any value to us, means that we must follow the lead given by the Australian Colonists. We have to co-operate, to combine, and to establish factories, and we require to have chilling and freezing works for the preservation of our perishable products.

Co-operation means securing to the producer the maximum value of his products, and minimising the middleman's exactions; combination will give him command of capital; the factory will produce the finished article in its best condition, at a minimum of cost, and the freezing and chilling works will preserve the product until required for consumption or export. The first three of these are within the reach of the Natal farmer, and those interested in the soil; the last should have the immediate attention of the Government, with a view to the provision of cold storage works by the State for the benefit of both producer and consumer in our country, and these works should be conducted at the lowest possible cost, in the interests of all classes of the community.

Respecting the re-stocking of Natal with cattle — which has become a necessity — the most suitable district from which to obtain the animals required is the northern part of Queensland, owing to the similarity of the climate, and because salted or trek immuned stock are obtainable there. The kinds are chiefly Shorthorn and Hereford. Yearling heifers should be purchased; by this means more "lives" will be secured for the money expended, and the cost of freight on each "life" will be half that on mature animals. Young stock will also stand the change better. The average price of yearlings is about 30s. to 40s. per head, but I would point out that cattle are now rising in value in Australia, owing to the losses occasioned by drought. This matter is one of vital importance to our Colony, and I would suggest the advisability of its being taken up by the Agricultural Department as early as possible.

In conclusion I would point out that although we have cheap labour and comparatively plenty of it, we are unable to compete with the Australian with his dear labour owing to our want of industrial organisation.

I will be able to furnish more detailed information in connection with the different industries through the medium of the *Agricultural Journal*, such information being withheld from this report, with a view to avoid unduly lengthening it.

I have much pleasure in placing on record that no trouble was too great, either to Government or individuals, in their endeavours to assist me to obtain the information I now submit.

F. R. MOOR.

Pietermaritzburg,
14th March, 1901.

Some few years ago Messrs. Halse Bros. obtained, through the late Mr. J. D. Ellis, a number of trout fry taken from the Hatcheries, Pirie Forest. These were carefully placed in a magnificent dam—one of several on the estate—and for some time nothing was heard of the result of the experiment. Suddenly the hearts of Messrs. Halse Bros. and three enthusiastic gentlemen in King were gladdened by the capture of three year-old trout, weighing respectively 7½lb., 8½lb., and 8lb. 2oz. Now, again, "Carnarvon" has topped the record. On the 20th instant a magnificent trout (four-year-old) was caught in the dam, weighing 14lb before cleaning, and a trifle over 12lb. after, the length being 31in.

Correspondence.

To the Editor of the Agricultural Journal.

HORSE-BREEDING.

SIR,—Mr. Medley Wood informs me that the grass referred to by me in my letter of February 2nd is the "Panicum laevifolium," and states that "as the grass is a comparatively new species nothing has been published, or, as far as I know, is known of its value as a food for stock, but this is the sort of information we expect to get from farmers and graziers in the districts where the plants are found. Judging from its very close relationship to the 'Guinea' grass, I should say that it might prove an excellent food for stock, but it has the disadvantage of being annual, while the Guinea grass is' perennial.'"

"En Passant," in his second letter, hoped for "good, wholesome, argument, and an exchange of honest opinion," and I only regret that none of the prominent horse-breeders of Natal have come forward to express their views as to whether Natal is or is not a suitable country for horse-breeding.—Yours, etc.,

C. B. LLOYD.

GRAPE BERRIES BURSTING.

Sir,—Grapes require a comparatively dry atmosphere at time of ripening, so I think excess of moisture at that time has most to do with the splitting of the berries.

Great heat, followed by dull, rainy weather, is frequently a cause; in fact, generally so, but insufficient drainage has often helped the trouble.

Vines should never have too much moisture at the roots when the berries are turning colour, as this causes too great a flow of sap and consequent luxuriance of growth, but on the other hand the roots must *never* be allowed to get dry.

Thoroughly good drainage is essential in grape growing, and if the soil is not drained naturally, artificial means must be used.

Mr. Delvin does not give any particulars as to his treatment of his vines. If he did this I might be enabled to help him more; but I think he will find that atmospheric influence, as stated above, is, in the main, the cause of the berries splitting, and that being a matter of climate cannot be well obviated.—Yours, &c.,

G. H. WILKINSON,
Nurseryman,
per A.J.W.

Maritzburg.

In Mr. Wm. Lister's letter on this subject, which appeared in the last issue, the word bunches instead of branches should have been printed in lines 4 and 19. In the last two lines, owing to the transposing of the words "not" and "all," the sense is quite upset. The lines should have read: "I met the owner, who had a long face, saying his grapes were all blighted." My reply was: "Not blighted, but starved."

WATTLE ASH FOR MANURE.

Sir,—The report on the above, by Mr. Pardy, which appeared in the last issue, should receive the attention of tobacco growers. Wattle ashes should be a first rate fertiliser, where easily procurable, for obtaining mild good burning tobacco. The ashes should be ploughed in, very shallow, four or five months before planting.—Yours, etc.,

J. M. VAN LEENHOFF,
Government Tobacco Expert.

Beaumont.

COMPOSITION OF DIFFERENT PARTS OF SUNFLOWER.

Dear Sir,—Will you kindly give in an early issue an analysis of the Sunflower, *i.e.*, stalk, leaves, head, and seed?

Yours truly,

JAMES THORROLD.

"The Moorings,"
Sunday's River.

[The Subjoined gives both the feeding value and ash (mineral) contents.—ED., *Agricultural Journal.*]

(FROM NO. 78 DEPARTMENT OF AGRICULTURE BULLETIN, U.S.A.)

	Water.	Protein.	Fat.	Nitrogen, free extract.	Fibre.	Ash.	Nitrogen.	Phosphoric Acid.	Potash.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Stalks (fresh)	75·24	1·46	·87	10·36	9·31	2·76	·94	·25	2·64
(air dried)	7·84	9·80	·68	34·77	33·85	13·06	...	...	...
Leaves (air dried)	16·00	3·50	1·00	35·40	40·00	4·10	...	...	...
Heads with seeds (fresh) ...	75·62	2·35	4·86	7·88	7·94	1·35	...	...	2·50
Heads (fresh)	81·99	2·79	3·03	6·28	4·55	1·36	2·87	0·78	...
Heads (air dried)	7·27	12·63	14·41	34·56	24·40	6·73	...	...	...
Seeds	7·50	14·22	32·26	14·50	28·08	3·44	2·28	1·22	·56

Rape for Young Pigs.

THE comparative value of rape and clover for young growing pigs has been the subject of experiment at the Wisconsin Experiment Station. Two lots of pigs, each containing 21 pure-bred and high-grade Berkshire and Poland-Chinas, were selected for the test, the animals averaging a little over 100 lbs., each in weight when the test began. Both lots were given a grain ration of one part middlings and two parts maize meal with water. The pigs in Lot 1 were also turned into a field of rape, while those of Lot 2 were pastured on clover. The former were somewhat slow acquiring a taste for the rape, but at the end of a week of preliminary feeding they ate it greedily. The experiment covered four periods of two weeks each, and during the time the pigs in Lot 1 ate the rape from about three-quarters of an acre. The average daily gain from Lot 1 was 1.27 lbs., and 1.22 lbs. from Lot 2. From the results of the experiment, which have been carried out for two years in succession, it is concluded that farmers feeding a large number of pigs cannot provide a better pasture for their sows and young pigs than by sowing small plots of rape at successive periods about three weeks apart during the spring and early summer.

Analysis of Various Fertilisers.

THE following report by Mr. E. Nevill, F.I.C., F.C.S., &c., Government Chemist, on various fertilisers, is published for general information :—

The values assigned must not be taken as representing the actual money value of the manure, but as the approximate value of the constituents, supposing them all to have been utilised as far as possible. Thus, samples 1 and 2, though described as "Bone Dust," were really "Bone Meals," containing many fragments so large that they would not be decomposed for years. Hence though the lime, nitrogen, and phosphoric acid they contained might have the value of about £8 10s., yet as the farmer would have to wait for years before all was utilised, their actual value to him would not be two-thirds of this amount.

The samples of "Muriate of Potash" and "Sulphate of Ammonia" were both of excellent quality.

The sample of "Cape Guano" contained feathers, wood, and small stones, equivalent to about one-sixth of its weight.

RESULTS OF AGRICULTURAL ANALYSIS OF CERTAIN MANURES OR FERTILIZERS.

No.	Description.	Lime.	Potash.	Nitrogen	Phosphoric Acid.		Total.	Remarks.
					Soluble in Water.	Soluble in 1 per cent. Citric Acid.		
		Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	
1	Bone Dust (A)	21·56	...	5·29	..	...	16·35	Contains 8 per cent. of moisture and 3 per cent. of sand.
2	Bone Dust (B)	23·58	...	3·96	...	...	17·68	Contains 7 per cent. of moisture and 7 per cent. of sand.
3	Thomas' Phosphate ...	39·93	...	...		4·44	16·80	Contains 14 per cent. of insoluble constituents.
4	Muriate of Potash	...	60·40	...	...	...	...	Contains 95½ per cent. of potassium chloride.
5	Sulphate of Ammonia ...	...	...	20·95	...	...	...	Contains 98¾ per cent. of ammonium sulphate.
6	Bird Island Guano	31·90	...	·71	·42	·57	29·23	Contains 18 per cent. of moisture.
7	Cape Guano	12·68	1·48	8 96	1·38	1·80	13·30	Contains 11 per cent. of moisture and 15 per cent. of gravel.
8	Farmers Special Potato (A)	22·23	1·62	1·98	5·12	8·83	12·60	Contains 6 per cent. of moisture and 2½ per cent. of free acid.
9	Potato (Brand A) (B)	24·41	2·14	2·07	9·12	11·34	20·33	Contains 12 per cent. of moisture and 1½ per cent. of free acid.
10	Cross's Root Guano (A)	21·86	...	1·32	10·89	12·01	14·91	Contains 12 per cent. of moisture, 4¾ per cent. of free acid, and 6 per cent. of sand.
11	Cross's Potato Guano (B)	17·98	1·78	3·52	8·96	9·90	12 83	Contains 13 per cent. of moisture and 4 per cent. of free acid.

APPROXIMATE VALUES OF THE ABOVE CONSTITUENTS PER IMPERIAL TON OF MANURE.

No.	Description.	Lime.	Potash.	Nitrogen.	Phosphoric Acid.		Not Soluble in Citric Acid.	Other Constituents.	Total Value.
					Soluble in Water.	Additional Soluble in Citric Acid.			
		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£ s. d.
1	Bone Dust (A)	27 0	...	61 9	...	...	80 9	2 6	8 12 0
2	Bone Dust (B)	29 6	...	46 3	...	...	88 6	2 0	8 6 3
3	Thomas' Phosphate	50 0	...	...	...	29 9	41 3	1 0	6 2 0
4	Muriate of Potash	...	402 0	...	...	...	...	..	20 2 0
5	Sulphate of Ammonia	...	...	261 0	...	...	...	...	13 1 0
6	Bird Island Guano	40 0	...	8 9	3 0	1 0	143 0	3 0	9 18 9
7	Cape Guano	16 0	10 0	108 0	9 9	2 9	57 6	1 0	10 5 0
8	Farmers' Special Potato (A)	28 0	12 6	24 0	36 0	24 6	18 9	4 0	7 6 9
9	Potato (Brand A) (B)	30 6	14 3	24 9	64 0	14 6	45 0	3 0	9 16 0
10	Cross's Root Guano (A)	27 6	...	16 0	76 3	7 6	12 0	3 0	7 1 3
11	Cross's Potato Guano (B)	22 6	12 0	42 0	62 9	6 3	14 9	4 0	8 3 6

About Bonedust.

SAYS "R. D." in *The Australasian* :—It is not wise to delay purchasing artificial manures until almost the moment they are required. It is more than probable that a great deal of manure will be required next season, and the farmers who take time by the forelock and secure the fulfilment of their orders at the earliest period that is convenient will, in all probability, have reason to congratulate themselves before the close of next sowing season. Some manures, bonedust for example, improves by being kept in a heap three or four months before it is required for use, a fact to which sufficient importance is not generally attached, hence the desirability of laying in a supply before it is actually required for use. The efficacy of bonedust as a manure, assuming it to be pure, depends upon its solubility. In this connection experiments conducted by Voelcker many years ago are instructive and reliable. He found that different kinds of bone varied much in their solubility and practical efficiency as manures, and his experience led him to the following conclusions .—1. Bonedust made from solid bones, even when reduced to a fine powder, is less soluble in water, and acts more slowly on vegetation than much coarser bonedust made from porous or spongy bones. 2. Fresh bones impregnated with grease do not readily enter into decomposition, and are less valuable as a manure than bones from which most of the fat has been removed by boiling in an open copper. 3. Fat or bone grease has no fertilising value whatever, and, as it retards the solution of bonedust in water, it is decidedly an objectionable constituent of fresh bones as far as the agriculturist is concerned. 4. Water dissolves much more phosphates of lime from rotten than from fresh bones. 5. During the putrefaction of bones soluble nitrogenous organic compounds and ammoniacal salts are produced from the gelatine contained in the bones. These compounds act powerfully and quickly as fertilising constituents, and are indirectly useful in greatly enhancing the solubility of bone phosphates in water. 6. Bonedust kept in a heap for three or four months heats and becomes more efficacious as a manure than bonedust applied to the land fresh from the mill. 7. High-pressure steam renders bones so brittle that they can easily be ground into a fine powder, which is readily assimilated by plants. 8. Bonemeal prepared by high-pressure steam contains not much less nitrogen than ordinary bonedust, and, as a manure, is far more efficacious and valuable than the latter. 9. Placed in a heap, with ashes or sand, and occasionally moistened with liquid manure or water, bone enters into putrefaction, and becomer a much more soluble and energetic manure than ordinary bonedust.

Milking Trials at the Dairy Show.

IN his reports in the Journal of the British Dairy Farmers' Association on the milking trials at the London Dairy Show, Mr. F. J. Lloyd, F.I.C., suggests some alterations in the arrangements for carrying out these competitions. He suggests the following plan :—"If every cow were milked out on the Monday evening, again at seven on Tuesday morning, and the milk weighed, then the inspection might take place on Tuesday afternoon, prior to the second weighing at 6 p.m. on Tuesday evening. The cows would then be in a normal condition, and not, as at present, when judged at 11 a.m., or later, in an abnormal condition, with their udders extended, and containing seventeen or eighteen hours' secretion. It is this abnormal condition on the Tuesday morning which upsets the cows, and causes, frequently, abnormal results to be obtained in the subsequent milking trials, so that the results obtained at these trials carry far less weight, and, indeed, are far less valuable than they might and ought to be.'

A good dairy cow should be giving the greatest amount of milk within three months of calving. After hat begin to reduce the feed gradually, allowing her to dry up and have a rest of two months each year.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions in the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—The market all round is quiet, with nothing in the near future indicating a more vigorous condition. All over the colony there have been abundant rains, and if frost holds off until after the middle of May, a record crop in mealies will be chronicled.

Mealies.—During the past fortnight a quantity of grain has been disposed of by farmers, who have now come to the conclusion that it is useless to hold any longer, as the chances of a rise are too remote. Grain on the market has been as low as 3s. 11d. per 100lbs. but good white mealies have realised 5s. 4d., 5s. 6d., and one lot of extra good quality realized 5s. 11d. per 100lbs.; 10s. per muid, including sack, has induced a good many farmers to part with their stock.

Forage.—From 7s. 1d. to 11s. per 100lbs.

Hay.—Some excellent samples have been sold during the past fortnight, and prices have varied between 1s. 5d. and 2s. 6d. per 100lbs; bedding and loose hay, from 3s 6d. to 28s. per load.

Potatoes. Good tubers are scarce. Early Rose, from 9s. 6d. to 18s. per 100lbs.; Beauty of Hebron, from 9s. 3d. to 15s. per 100lbs.; Up-to-date, from 11s. 6d. to 15s. 6d. per 100lbs.; Sweet potatoes, 2s. 9d. to 6s. 3d. per sack

Peas.—From 9d. to 14s. per 100lbs.

Beans.—From 10s. to 10s 6d. per 100lbs.

Tobacco.—Only a small quantity offered, and being of inferior quality only realised 5½d. per lb.

Pumpkins.—From 1s. to 6s. per dozen.

Onions.—From 6s. to 27s. 6d. per 100lbs.

Poultry.—Fowls, from 2s. 8d. to 3s. 9d. each; ducks, from 5s 6d. to 9s. 9d. per pair; turkeys (hen) 6s. 6d. each

Butter.—From 6d. to 2s. 6d. per lb.

Eggs.—From 1s. 6d. to 3s. 11d. per dozen.

Sundries.—Bacon, 3d. per lb.; ham, 10½d. to 1s. per lb.; mutton, from 4d. to 9d. per lb; pork, from 2d. to 8d. per lb Several lots of fresh fish have also been disposed of.

Fruit.—Apples, bananas, grapes, grenadillas, lemons, mangoes, peaches, pears, pineapples, plums, and quinces (including several lots of Cape fruit) have found ready purchasers.

Vegetables.—Beans, beetroot, bringals, carrots, cabbages, cucumbers, green mealies, onions, rhubarb, tomatoes, and turnips have been sold daily.

Firewood.—From 3d. to 11½d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44 writes:—

General.—Trade is somewhat dull and featureless. Restrictions on Cape imports do not tend to improve matters.

Mealies.—The market is excessively dull, and there is an entire absence of movement. The imminence of a record crop, the large reserves of old stock, and the presence of heavy parcels of imported grain are not encouraging features from the buyers' point of view. Business is thus confined within its narrowest limits and quotations are merely nominal.

Potatoes.—Very small supplies forward, and high rates are obtainable for choice lines. Really good Early Rose readily bring 20s. a bag. The crop in spite of severe blighting is very large, and lower rates may be looked for shortly.

Mabele.—There is a good demand, and new grain brings about 18s. 6d. per bag of 203 lbs. The crop is reported large, and quotations will probably ease off.

All other produce in good demand, but in small supply.

One reason why factory milk is often delivered in poor condition is that farmers do not take good care of their cans. They sometimes wash them out with dirty water, then put on the covers without thoroughly rinsing, and do not let in the air. The only way to remedy this is to wash the cans thoroughly and allow them to drain and stand in the sun as much as possible. —*Queenslander.*

Lice are one of the greatest enemies of the poultry yard. Unless everything be kept scrupulously clean they will gain a foothold and multiply with astonishing rapidity. A good way to destroy them is to make a kerosene emulsion. Put in a large can of boiling water enough soap, shaved fine, to make thick soapsuds; the suds must be very soapy. Add to the suds kerosene oil in the proportion of one quart of oil to ten gallons of soapsuds. To this mixture add a small quantity of carbolic acid. The acid is not absolutely necessary. With a sprinkler or spraying machine apply this mixture to every part of the fowlhouse, and in every crevace likely to afford a harbouring place for lice, and it will destroy them.

Mr. Hughes, a New Yorker famous for his practical joking, has put the judges of a horse show in a ridiculous light. Under an assumed name (says the *Yorkshire Post's* New York correspondent), he entered a horse in the saddle class, and at the trials his daughter rode the animal round the ring. The horse and another were finally selected as the most worthy of the class, but in the final trial the other animal was awarded the blue ribbon. When Mr. Hughes learned his horse had just missed carrying off the prize, he soberly announced that his entry was a cast-off tramcar horse. The judges are now busy explaining how they were fooled. Mr. Hughes two years ago entered a stray tom cat in the Oriental female class of the cat show, and a special prize was awarded him by the judges.

The Agricultural Journal

AND MINING RECORD.

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CONTENTS.

Horsesickness Investigations.

INTRODUCTORY.

By H. WATKINS-PITCHFORD, F.R.C.V.S.

A GOOD deal has been written of late about horsesickness, which, though essentially a South African disease, seems by its serious nature to have attracted the attention of scientists in other parts of the world than South Africa.

Some months ago a treatise from the pen of Professor M'Fadyean, of the Royal Veterinary College, was published, and following close upon that appears the report of a lecture delivered by the famous French savant, M. Nocard, dealing with the same subject.

The recent report upon the disease—or rather in the advance made in its prevention—published by the Director of the Cape Bacteriological Institute, will be fresh in the memory.

In reviewing these various reports and papers it seems a little unfortunate that it should be necessary to publish results of work done which are only able to do small service towards the real check of the disease and our knowledge of it. Such reports are necessarily inconclusive or conjectural in character, and do little good besides securing to the worker priority of suggestion or result in limited directions, while the drawback to such premature or immature work is that other workers in the same field are perforce obliged also to adopt the same attitude of importunity, or run the risk of forfeiting the claim to originality and priority, which to the scientific worker means success.

As is known, the Natal Veterinary Department has for the last few years been working towards the elucidation of this knotty problem, and while the difficulties and drawbacks have been many — to instance, rinderpest, other urgent work of a similar nature, great and constant departmental demands, and lately the state of war in which South Africa has been plunged – still the work has gone on steadily as the occasion offered, with the result that much solid and satisfactory work has been accomplished, work of elimination and negation —if the term may be allowed—rather than the positive results often obtainable in less difficult walks of scientific research.

The details of such work will appear in due time, and will show the immense amount of work and thought necessary to the carrying out of such an investigation.

Without attempting to place before the readers of the *Agricultural Journal* a tabulated report of the work done and the conclusions already arrived at—which being to a great degree technical would serve no practical purpose beyond demonstrating the methods and difficulties of such work—it seems possible that a description or detailing of the experiments now in progress, and their object, might result in some furtherance of the work if those interested in the matter would enter, to some extent, into the enquiry, and not hesitate to express their views, and particularly give any relevant experiences they may possess.

Such experiences and observations must amount to a great deal in a community of intelligent farmers, who by reason of the difficulty in obtaining professional assistance, have had for years past to make their own observations and deductions, both as to the cause of the disease and its treatment.

In laying my views, therefore, before the readers of the *Agricultural Journal*, I shall deem it a kindness if any points, either corroborating or discounting these views, are brought to my notice by those whose knowledge of the disease is of long standing, or who have suffered heavily from its ravages.

It has been with much pleasure that I have learned, within the past few days, that my impressions and theories as to the causation of the disease have been entertained also by my colleague, Dr. Theiler, of Pretoria, and I shall, therefore, propose to ask him to give his views of the cause of the disease to the readers of our Natal *Journal* in corroboration of those which are now appearing, as, while they were arrived at quite independently of the Natal work, they are reassuring, inasmuch as they record the observations and theories of a careful and experienced scientific worker in the same field. In a report recently published by a South African worker, having had many years of experience with horsesickness, the statement is made that the disease is not due to the agency of insects, such as the mosquito or other blood-sucking insects, for various reasons adduced, and the cause is declared to exist elsewhere. It is in support of the view here denounced as untenable that experiments are now, and have been since the commencement of the year, in progress in Natal, and it is in concurrence with this view that Dr. Theiler will also add his testimony in the subsequent numbers of the *Natal Agricultural Journal*.

As illustrating the devastation caused by the drought in the Hughenden District, Queensland, Mr. Crank, stock inspector, who has toured the north-west portion of the District, states that one station has only 39,000 sheep left out of 110,000. Another has 10,000 left out of 42,000, a third 1,000 out of 28,000, and a fourth 16,000 out of 42,000. He estimates that 45 per cent. of the sheep in that district at the beginning of the year are now dead from the effects of the dry weather. Useful rains have fallen in the Central District, registering from 2in. to 3in. in places.

Analysis of Limestone.

(*Published by Order*).

COMMISSIONER OF AGRICULTURE,—

I HAVE examined the sample of limestone handed in by Mr. Stanger-Higgs for report, and find it contains a very fair proportion of lime, viz :—48·973 per cent. equal to 87·451 of carbonate of lime. An analysis showed the following percentages :—

Silica	8·438
Iron and Alumina ...	2 000
Carbonate of Lime ...	87·276
Phosphate of Lime ...	·013
Sulphate of Lime ...	·255
Carbonate of Magnesia ...	1·503
Manganese	·065
Moisture, &c.	·450
	100·000

The limestone, I understand, is found in large quantities in the dongas near Washbank, antiguous to the coalfields, and seams of coal, which can be opened up on the land, where every facility is offered for turning out a moderately priced lime. Mr. Pearce, who is connected with the enterprise, informs me that he expects to be able to place the burned limestone on the Railway at Waschbank, at from 30s. to 35s. per ton, and raw ground lime at probably 10s. per ton less, prices which compare most favourably with those at present quoted on the Durban market, viz., £3 to £4 per ton.

The limestone, although not pure, contains a very large percentage of lime, and appears to me to be a very suitable one for agricultural purposes, especially when its low price is taken into consideration. There appears to be a large accumulation or segregation of the stone, as I am informed the quantity is more or less unlimited.

The owners, I believe, are prepared to offer both burned and raw ground lime as desired, and on the analysis proving satisfactory to commence operations at an early date, when I hope to receive a sample of their burned product to determine how far the process has affected its value.

The raw ground lime should be very suitable for marling and for mild applications, most suited for light soils, but the burned lime is likely to give a finer distribution, and in most cases is preferable, as its action is more energetic and applicable to medium, heavy, clay or sour soils.

From an examination of the sample, I am of opinion that the material is worth handling, and will prove a most useful article for agricultural purposes.

The deficiency of lime is very marked in most Natal soils, and there is great need for a cheap lime to remedy the defect. In almost any soil its addition is beneficial to plant life, but in soils which are so poorly supplied as ours, I am safe to say that marked results must arise from its judicious use.

ALEX. PARDY, F.C.S., ETC.
Analyst to Agricultural Department.
27th March 1901.

At a sheep-dressing exhibition held at Indianopolis, U.S, September 3rd, Charles J. Gardner, of that city, broke the world's record by killing and dressing 10 sheep in 30 minutes and 22 seconds, thus beating his own record of 10 sheep killed and dressed, in 1898, within 32min. and 9sec In his latest performance Gardner was somewhat handicapped by a severe accidental cut upon the left arm.

A correspondent of the *Country Gentleman* strongly recommends sorghum hay as a stock fodder. He states that on a small plot near his place as much as nearly eight tons of sorghum hay has been made per acre. In another instance he states that forty head of cattle were fed on the produce of a single acre for six weeks, and this was in a season of drought. He strongly recommends heavy seeding, and says that two bushels of seed per acre give a fine hay, easily handled, while one bushel of seed per acre will give a much coarser hay that is difficult to handle. The best crops are said to be grown on rather thin land fertilised with superphosphate as for wheat. When grown on strong, heavy soil the crop is very heavy, but is apt to lodge, and is often difficult to cut. Sorghum hay is seldom, if ever, seen in Australia, and as it is a heat-loving plant it might be advisable to utilise this plant to provide a stand-by for stock in times of scarcity. Cattle are said to be fond of sorghum hay, and do well on it.

District Reports.

BULWER, 4th April.—It has done nothing else but rain here for the last fortnight, but strange to say, about 15 miles from Bulwer farmers are complaining of want of rain, and declare the ground is parched and springs have dried up. Several cases of horsesickness have occurred lately. Dr. Gilman's race horse was bad last week; fortunately Mr. Verney, the District Veterinary Surgeon, succeeded in pulling him through. The horse had never been out of the stable and was only fed on oats and forage. It is difficult to say how he got the disease. Generally speaking, horsesickness seldom troubles horses in the village of Bulwer. There have been several cases of redwater and gallsickness amongst cattle the last month, and I have only heard of one beast dying from the disease. Lungsickness is still bad at the farm Coleford; 22 head of cattle have died up to date. I am glad to say the disease has not spread to other farms, which was feared, as some oxen had been taken from the infected troop just before the disease broke out to some farms adjoining Coleford for ploughing purposes. There is very little scab at present in the flocks of sheep in the Division, I am glad to say. A very severe hailstorm visited the Umkomazana locality a few days ago, completely destroying the Native crops for miles. Many Kraals will not reap either mealies or mabele this season. The farms Sarnia and Fernbank near Bulwer have changed hands lately. It was a treat to see the former well stocked a few days ago. Both farms have been unoccupied for a long time. I observe that the proposed railway have through this Division will be about eight miles away from the village of Bulwer, which, if carried out, will be very detrimental to the progress of the village.

H. W. Boast, Magistrate.

HARDING, 4th April,—We have now had a fair amount of rain, but we are still behind the average, as compared with other seasons. The crops in some parts of the District promise to be very good, in others again, especially in the thorns, they are very poor, in fact Natives are buying mealies already. I hear good reports *re* the extermination of locusts. Favoured with damp weather the fungus seems to have done its work. Stock are looking well, and horsesickness has not visited us so far this season. Hay cutting has been very much delayed owing to the continued damp weather.

P. W. Sheepstone, Magistrate.

NDWANDWE, 24th March.—For month of February the rainfall was 9·05 inches, highest temperature 93 degrees, lowest 58 degrees. Stock is healthy and in splendid condition. Crops throughout the District are looking exceedingly well, and, with the exception of parts ravaged by locusts, give promise of a very good harvest. Already quantities of this season's mealies are finding their way into the market.

A. W. Leslie, Magistrate.

NQUTU, 1st April.—The past month has witnessed a continuation of the abnormal rains which were experienced in February, but latterly the weather seems to have resumed normal conditions, and the rainfall shows signs of approaching winter. The mornings and evenings, too, savour more of winter, a distinct "bite" being perceptible in the air. A fresh outbreak of lungsickness has occurred amongst stock in the possession of the meat contractor to the troops stationed at Nqutu, otherwise the disease which has shown itself previously in a few Native herds has made no headway, and the District may be regarded as fairly free from disease amongst cattle. Horses are in very fine condition, and there has been no case of horsesickness. As a result of the continuation of the rainy season the grazing, for this period of the year, is in very good condition. Crops are fast ripening, and a good harvest is assured.

C. Hignett, Magistrate.

Good progress is being made with the arrangements for the establishment of a stemmery for tobacco-leaf at Wangaratta, and the Government expert, Mr. A. J. Bondurant, expects that he will be able to commence the work of stemming shortly after the new year. Consignments of leaf will then be forwarded to England regularly, and the stocks still held in the District will be gradually reduced. A shipment of 30 tons, prepared by growers of the Upper King District under Mr. Bondurant's supervision, was sent away last week, and there is inquiry by buyers in England for more.

The date palms in South Australia, we learn from the annual report of the Woods and Forests Department, continue to develop in a most satisfactory manner. Progress has been specially marked in the seedling plantation at Lake Harry, as well as among the Algerian palms planted there. Many of the seedlings have already flowered. The Algerian palms have made great progress, and some are now 0ft. high. Sufficient fruit was borne this year to show that a fine sample of superior quality may be expected when the trees are in full bearing. There are now 3,058 date palms of all ages growing at Hergott, Lake Harry, and Oodnadatta. These plantations are of much interest to the residents of tropical Australia, as they prove that dates of excellent quality can be grown in the hot districts of these colonies.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inanda & Ndwedwe	Lungsickness	H. Gillespie ...	Avoca.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein.
		,,	P. Boshoff ...	Smalldeel.
		,,	J. F. Maritz ...	Springbank.
		Lungsickness	J. T. Howell ..	Doornkop.
		,,	Joeisa ...	Klipfontein.
		,,	Toonyani ..	Chieveley.
J. Button ...	Estcourt, South of Bushman's River	,,	J. Mattison ...	Klipstone.
		Scab	C. P. F. Marais ...	Stockton.
		,,	H. E. Kirby ...	Klipfontein.
A. H. Ball ...	Weenen ...	,,	C. P. F. Van Rooyen	Mona.
		,,	G. R. Van Rooyen	Vitooria.
		,,	R. J. J. Van Rooyen	Bird Spruit.
		,,	,, ,,	Doornkloof.
		,,	L. J. Lotter ...	Waterfall
		Lungsickness	Jogozalah ..	Woodford.
		,,	A. B. Bell ...	,,
		,,	Kamela and Kuhlawomhlaba	Inkasene.
		,,	Secwa... ...	Baviaan's Krantz.
J J. Hodson ...	Lion's River ...	Scab	Jas. King ...	Lyndoch.
		,,	Jas. Morton ...	Tweedie Hall.
		,,	H. Steadman ...	Woodlands.
		,,	C. Strapp ...	Oatlands.
		,,	G. Woodhouse ...	Halliwell.
		,,	Jas. Ross ...	Gowrie.
		Lungsickness	A. Clark & Natives	Mount Ashley.
E. J. B. Hosking ...	Upper Umkomanzi	,,	H. Gillespie ...	Intimbankulu.
		,,	Native ...	Stirtreimfontein.
		,,	Turnbull & Co. ...	Glen Islay.
R. J. Raw ...	Impendhle ...	Scab	H. J. Martens ...	Wuthering Heights.
		,,	H. Phipson ...	Boschberg.
		,,	G. Q. Hamilton ..	Ivanhoe.
		,,	J. W. Brooke ...	Impendhle Store.
		Lungsickness	Crossley Bros. ...	Deepdale.
W. Wilson ...	Polela.	,,	H. Eaglestone ...	Coleford and The Bungalow.
C. E. Hancock ...	Ixopo ...	,,	J. H. Johnson and Natives	Dronk Vlei.
		Scab	Native Pietman ...	Wesley.
		,,	H. W. Chick ...	New Garrett.
		,,	C. Green ...	Gorton.
		,,	C. L. Hammond ...	Sunrise.
		,,	W. K. Anderson...	Maxwell.
		,,	J. Anderson ...	Lilliedale.
		,,	E. S. Clarke ...	Carr End.
		,,	Malambula ...	Location.
		,,	Budoza ...	Hlogozi.
		,,	Zinisani ...	Klipgat.
		,,	Solibamba ...	Lutafa.
A. J. Marshall .. (Acting)	Newcastle	Lungsickness	A. A. Osborn ...	The Mount.
		,,	Loxton & Rudd ...	Waterfall.
		,,	Native Shallos ...	River View, Ingogo.
		,,	H. P. Beare ...	Glen Hesit, Ingogo.
		,,	G. L. Fraser ...	Ingogo.
		,,	J. F. Grant ...	Hilldrop.
		,,	H. S. Dicks & Sons	The Retreat
		,,	Native Funwayo...	Tigerkloof.
		,,	Umbobo & Lugudu	The Gardens
		,,	Umgodini ...	J. Adendorff's farm Ingagane.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall (Acting)	Newcastle	Lungsickness	Kotshaindoda	N. Dugenaar's farm, Ingagane.
		,,	J. W. O'Reilly, Natives Jonas, and Paplana	Newcastle T'Lands.
		,,	L. H. S. Jones	,,
		,,	J. Hodgson	Belvedere.
		,,	Bob. Salugwanda	Boschhoek.
		,,	A. Nottman	,,
		,,	P. L. Uys	Jackalspan.
		,,	T. Breary	Newcastle Colliery.
			J. Davidson	Lennoxton.
		,,	A. Danks & Fox	Crown Colliery. Newcastle.
		,,	Beckeroo	Lennoxton.
		,,	J. Smith	,,
		,,	— Sheikamier	Newcastle.
		,,	J. J. Exsteen	Manning.
		,,	A. Paine	Mount Prospect
		,,	F. W. Hatley	,,
		,,	E. Parker	,,
		,,	Ramsaroop	Newcastle.
		,,	G. J. Way	Vrede.
		,,	Unjopal & Eseresing	Newcastle.
		,,	A. H. Tatham	,,
		,,	J. W. Janes	,,
		,,	G. Brown	Wykom.
		,,	Macdonald & Kemp	Lennoxton.
		,,	Natives	Whykombe.
		,,	,,	Droog Plaats.
		,,	J Pettigrew	Newcastle T'Lands.
		,,	A. Krause	Filexton.
		,,	G. W. Nourse	Ingogo.
		,,	Simeon Ndhlovu	Freda.
		,,	— Hodgson	Newcastle T'Lands
		,,	S. W. Reynolds	,,
		,,	O. Olver	,,
		,,	D. S. Redman	Snipe Marsh.
		,,	R. T. H. Harrison	Lennoxtown.
		,,	F. Ferrier	Henley Farm.
		,,	G. W. White	Ruth.
		,,	C. R. Savory	Pomeroy and Evin.
		,,	Dr. Ormond	Ingogo.
		,,	Seikomya Datuz	Newcastle T'Lands.
		,,	Loxton & Rudd	Waterfall.
		,,	L. C. Koch	Kabbaslaagte.
		,,	D. Miller	Roseless
		,,	H. Singleton	,,
		,,	E. Graham	,,
		,,	Cooper & Chandley	Newcastle T'Lands.
		,,	Blizzard & Pratt	Ingogo.
		,,	J. W. A. Welsh	Paradise.
		,,	— Hanstin	Wykom.
		,,	J. G. Kemp	Heighton.
		,,	G. Star	Lennoxton.
		,,	G. Wood	Heron's Court.
		,,	W. L. Lea	Lennoxton.
		,,	J. Mortimer	Try Again.
		,,	P. W. Dept.	Newcastle T'Lands.
		,,	S. Loxton	Lennoxton.
		Scab	C. de Wet	Schuinshoogte.
		,,	H. S. Dicks	Lennoxton.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District	Disease.	Owner	Farm.
A. J. Marshall ... (Acting)	Newcastle ...	Scab	A. J. Middleton ...	Ingogo.
		,,	W. E. Few ..	,,
		,,	F. Johnstone ...	Craig.
		,,	Umkwenesi ...	Alcock's Spruit.
		,,	J. Dicks ...	Vet Klip.
		,,	F. R. Tewson ...	Rooi Point.
		,,	W. A. Lang ...	La Belle Esperance.
		,,	J. Vanderwesthuise	Hartebeestelaagte.
		,,	W. C. F. Napier ...	Eagles Cliff.
		,,	J. A. Vanderplank	,,
		,,	A. P. de Jager ...	One Tree Hill.
		,,	G. J. Way ...	Vrede.
		,,	J. W. O Reilly ...	Gordon.
		,,	H. P. Beare ...	Ingogo.
		,,	J. Matthew ...	Shakespeare.
		,,	O Schwikkard ...	Foscabelli.
		,,	G. Star ...	Lennoxton.
		,,	R. S. Miller ...	Goloch.
		,,	W. C. F. Napier...	Newcastle T'Lands.
		,,	C. G. Palmer ...	Dry Cut.
		,,	P. L. Uys ...	Jackalspan.
A. S. Parkinson ...	New Hanover ..	Lungsickness	E. Bentley ...	York.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	T. Dawson ...	Zwartkop.
		,,	C. Oldfield ...	Wilgefontein.
		,,	J. Neden ...	,,
		,,	Tobea ...	,,
		,,	Shaik Modeen ...	,,
		,,	Cidia	,,
		,,	R. Coster ...	Slang Spruit.
		,,	W. Oldfield ...	Ambleton.
W. Wright ...	Klip River	,,	T. Ellison, G. Cowan, and G. E. Robinson	Ladysmith Town Lands.
		,,	Discharged Transport Cattle	Matowan's Kop.
		,,	W. J. Tully ...	Grobelar's Kloof.
		Scab	Loot Sheep ...	Van Reenen's Pass.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	— Spence ...	Reunion Estate.
W. Freer ...	Upper Tugela ...	,,	J. W. Coventry ..	Rangeworthy.
		,,	D. Munger ...	Bedale.
		,,	Mr. and Mrs. C. C. J. Bester	Bester's Hoek.
		,,	W. Freer ...	Acton Homes.
		,,	G. Von Beneker...	Drill.
		,,	H. H. Reed ...	Mains.
		,,	W. O. Coventry ...	Acton Homes.
		,,	H. Francis ...	Bedale.
		,,	G. Spearman ...	,,
		,,	G. H. H. Coventry and Native	Rangeworthy.
		,,	G. Spearman ...	Spion Kop.
		,,	F. Zunkel ...	Klein Waterfall.
		,,	T. H. Creevin ...	,,
		,,	Dr. Jones ...	,,
		,,	D. G. Giles ...	Upper Tugela Magistracy.
		,,	J. Reed ...	Roode Bent.
		Scab	J. Scheepers ...	Sand Drift.
		,,	C. Crawley ...	Waterloo.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
G. Gielink ...	Zululand ...	Lungsickness	M. Titlestad ...	Ntingwe.
		,,	Dinizulu ...	Hlabisa District.
		,,	Noiwana ..	Nqutu.
		,,	Natives' Cattle ...	Melmoth.
A. Klingenberg ...	Umsinga ...	,,	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
		,,	Combrink Bros. ...	Uithoek.
		,,	Mrs. H. Strydom...	,,
R. Marshall ..	Dundee ...	,,	Marshall Bros. ...	Cleveland.
		,,	— Dammann ...	Celle.
		,,	— Frockling ...	Henning.
		,,	W. Muller and C. Hellberg	Karlsburse.
		,,	— Schroeder ...	Schroeder's Hope.
		,,	do. ...	Rosenen.
		,,	— Haynes ...	Sterkstroom.
		,,	Military Authorities	Maypole.
		,,	A. F. Henderson...	Brazil.
		,,	— Stoffel ...	,,
		,,	— Ohlsen ...	Craigside.
		,,	Umquayo ...	Sweet Home.
		,,	Glutz ...	Rocky Glen.
		,,	Thorn ...	,,
		,,	D. Oppermann ...	Gedull No. 2.
		,,	— Botha ...	Jackalsfontein.
		,,	Cooper & Umbleby	Dundee.
		,,	Redman ...	,,
		,,	Natives ...	Craigieburn.
		,,	Cooper & Umbleby	Domain.
		,,	A. A Smith ...	Dundee.
		,,	Redman & Nourse	Craigside.
		Scab	— Hearn ...	Hatting Spruit.
		,,	J. W. Marshall ...	East Lynn.
		,,	— Ohlsen ...	,,
		,,	D. Meumann ...	Dundee.
		,,	A. & P. Conyers ...	Rest.
		,,	Natives Sheep' ...	Maypole.
W. A. Hutchinson	Alfred ...	,,	G. Whitelaw ...	Deemount.
		,,	W. Stafford ...	Sutherland.
		,,	Nqubu ...	Location.
		,,	Ngihla ...	St. Mary's.
		,,	Mpapu ...	Location.
		,,	Camulana ...	,,
		,,	Manxolo ...	,,
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	Faku ...	Mount Alice.
		,,	A. C. Beyers & Sons	Doveton.
		,,	A. P. Vandermerwe	Poortje.
		Scab	J. R. Vandermerwe	Noodhulp.
		,,	H. L. Francis ...	Rictfontein.
E. Varty ..	Umvoti—Western Portion	,,	T. J. & C. M. Botha	Welverdient.
		,,	L. M. J. Nel ...	Schikhoek.
		,,	Bros. P. R. & G. H. Nel	Wonderboom.
		..	W. Slatter ...	Holme Lacy.
		,,	H. Hansmeyer ...	On Rust.
B. C. Shooter ...	Alexandra ...	Lungsickness	H. Reynolds ...	Inyangweni.
		,,	Umjanie ...	Pasture.
G. N. Perfect ...	Umvoti — Eastern Portion	Scab	L. J. Nel ...	Welgegund.
		,,	J. A. Nel ...	,,

The whole of that portion of the Colony north of the Tugela River has been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
10th April, 1901.

M. J. HIME,
for P. V. Surgeon.

Coast Fruit.

AN INTERVIEW WITH A GROWER.

By "ERGATES."

FROM Pinetown to Durban the railway passenger sees on either side farm after farm of sub-tropical fruit. The farms are small, and possibly gardens might be a more appropriate word. The land is valuable, most of it within a mile of the railway stations being worth from £20 to £40 per acre. To get some information about this important district, I made enquiries as to a good authority, and by several who should be competent to judge, I was recommended to see Mr. Vincent Seymour, of Malvern. Mr. Seymour wrote, saying he would be pleased to give me all the information I might ask for.

Mr. Seymour comes from a family of gardeners, one of his forbears having devised the plan in the middle of the eighteenth century of training fruit trees on walls, and still known under the name of "Seymour's System of Wall Training": see "Louden's Encyclopaedia of Gardening." The land now occupied by Mr. Vincent Seymour was purchased by his father, the late Mr. George Seymour, in 1881. Mr. George Seymour was one of the very best gardeners who ever came to Natal, and was seventy years of age when he started at Malvern. Mr. Seymour, sen., was head gardener to the late Duke of St. Albans, on his Lincolnshire estate. Ten years before his father's death Mr. Vincent Seymour began fruit farming, under his father's tuition; prior to that he had been engaged mostly in mercantile pursuits.

A few years ago Mr. Seymour published a pamphlet, in which he showed by actual experiment that, given reasonable shipping facilities, a great trade might be done in Coast fruits with England. The facilities have not been conceded, but what is perhaps full compensation has come about. A trade of great proportions with the interior has been established.

"What are the fruits chiefly grown here?" I asked.

"Pines and bananas. The growing of these fruits is the most attractive to the Indian, and the Indian is a large cultivator in these parts. For the most part he is only a tenant; he pays £1 or so per acre per year, and tries to get the quickest return possible. It is only the white man who goes in for orchards, for the rearing of trees means capital lying dormant."

"One pound per acre rent is apparently tempting to landowners?"

"It is, but whether the policy is good I doubt. The Indian takes all he can out of the ground, growing altogether at the same times bananas, beans, groundnuts, tobacco, round potatoes, mealies, and so on. Rest is never given to the soil, and nothing in the shape of manure is ever returned to the land. Having worn out one plot of ground, he moves on to pastures new, and continues his former programme. As a reviver for exhausted soils dholl is one of the most effective things that can be grown on the Coast lands. Some Indians are beginning to buy outright. 'Bombay' merchants advance them the money. A great many of the cottages dotted about belong to mechanics, and their owners often do a little bit of fruit cultivation."

BANANAS.

"Bananas," said Mr. Seymour, "require good soil; bush land if gettable. In such soil they will last seven or eight years with help, but in grass land they will be of no use in three years. In Durban County alone enough bananas are grown to supply all South Africa, but I doubt if you wanted fifty cases delivered to-day you could get them, owing to the last three years of drought.

As with other of our fruits, it is glut or nothing. What is wanted is cool storage at the moderate charges of other Colonies. We look to getting about 12s. per case, for the fruit only; a packing case costs 3s., and a case signifies 800 of the fruit. When the Johannesburg market was closed by the 3d. per lb. prohibitive duty, I was glad to get 4s., though the price was utterly unremunerative. On good soil, such as I have, the banana requires manuring after the second or third year — stable manure, or rough weeds. The manuring may be called mulching. Mulching, of course, means spreading the manure over the roots and surface of the stool of plants, but here, with the hot absorbing sun, the overspreading of soil on whatever is applied is necessary. Shelter from wind is most necessary for bananas, and for practically all Coast fruit. There cannot be too much of it, for the wind is our worst enemy. Every fruit grower here should have high trees, say gums, growing as break-winds to the south and west of his farm. Orange trees are also good for shelter, and mealies help at a critical time. It is distressing for a grower to see all the beautiful leaves of his bananas torn into ribbons, as for the most part they are."

Mangoes.

"The most marketable mango is the 'Bombay.' It is very large, and not at all stringy. For my own eating I prefer the common kind. This country, however, is barely tropical enough for the mango. A cold, wet spring is fatal to the blossom, and such springs are not infrequent. In favourable seasons, however, crops are very heavy."

Pineapples.

"The 'Jamaica Queen' is the best pine. It does not top-sucker so much as the ordinary Natal kind. Pines, like potatoes, mealies, nuts, etc., require periodical changing. Pines should be top dressed before fruiting. They require good land, and are benefited by artificial manures—potash, preferably. Between the middle of October and the middle of December pines often fetch from 3s. to 8s. per dozen, for large, well-grown fruits, and afterwards they become a drug, and fetch barely as many pence. Jam makers rarely offer more than a halfpenny per lb. for them, and, as they need only half a pound of sugar for the pound of fruit, the returns should be good at the price jam is sold. Messrs. Barker Bros., living near here, are generally recognised as the growers of the finest pines."

Citrus Fruit.

"For the white man, the owner of land, citrus cultivation, in my opinion, is the most desirable. When once an orchard of these trees has been established — about seven years is necessary — he is in a good position. The profits are good, and the annual outlay in labour becomes comparatively small. Which of the variety is best to plant? I unhesitatingly reply the naartje — a Dutch name. It is really the mandarin orange, or perhaps more correctly the China orange, although originally it came from Assam, India. We are much in want on the Coast of a Fruit Growers' Society, to attend, among other things, to the nomenclature of our fruit. For instance, the Cayenne pineapple is popularly called the Queen, and Isabel grapes are called Catawbas, and so on. The common orange does not pay well, only 1s. 6d. to 2s. per hundred, on the average. The naartje, on the other hand, fetches 2s. to 5s. per 100.; it is less bulky, and travels well. Naartjes require plenty of attention. Half-a-dozen different blights — mussel, green and round scales, American blight, etc. — attack the trees from the earliest stage upwards, and the paraffin emulsion sprayer is in almost constant employment. Grasshopper 'soldiers,' who strip off the young bark, are also at times a great nuisance. I always plant from seed, and in tins, choosing only seed from the largest and finest quality fruits. Some prefer grafting on to lemon stocks. I think the fruit is not so good, although I know many will disagree with me on that point, and the gain in time, if the growing of the stocks is taken into consideration, is practically nothing.

Naartjes should be transplanted in the second and third year. They require good soil. Where my soil is too light, I put on ant-heap. All along the Coast we have ant-heaps ten feet high, and more in diameter. The soil of which they are composed is of the most tenacious character, and is just the thing wanted for sandy lands. Our soil is in great need of lime, and I hope when the Port Shepstone railway is opened that we shall be able to get it at a moderate price. I give my trees bone dust. In setting out naartjes I always plant just a trifle above the general surface. No earth should be thrown up against the stems, or canker will follow. In manuring it should always be borne in mind that the side roots extend for a long way from the stem, and that they are never deeper than twelve inches from the surface. Proper pruning is most essential. At eighteen or twenty inches from the ground let the tree branch out. I can show you an object lesson in this matter. One tree, which I pruned up to two feet six inches is as miserable a specimen as can well be conceived, and the next, with a short stem, where the soil and other conditions are identical, is about as fine a specimen as a grower can wish to see. The wood is hard, and the outer bark is closely attached to the wood, and will not stand the direct rays of the sun, especially when the thermometer registers — as it does some times — 90 to 95 degrees in the shade. The fruit should be all off by the middle of September. The 'Spanish Lemon' is also a good citrus for planting. The demand locally is small, but in England they would sell well. Some years ago I sent a small lot to Messrs. Wm. Draper & Sons, of Covent Garden, one of the leading fruit broking firms in London, and the lemons were valued at 12s. per 100 there in October or November.

Poultry as Weeders.

Mr. Seymour considers poultry a profitable and most useful adjunct to the business of the orchardist. He has one acre of naartje trees enclosed by an eight-feet fence of wire netting, and in the enclosure are 80 fowls, and hardly a single weed. This fence cost £15, he having found hard wood uprights. Had iron standards been used — old light tramway rails would serve excellently — the cost would have been nearly £25. Of course the enclosing of larger areas would cost much less proportionately. In protecting the naartjes from theft the benefit has been great, an ordinary fence being no protection against the astute thieves who abound in the fruit districts of the Coast. The poultry thrive splendidly, rarely dying from sickness, and, besides keeping the weeds down most effectually, they devour the insects, and particularly all that may infest fallen fruit."

General Observations

"You have said," I remarked, "that in this Coast fruit industry there is always a glut or a famine, that fruit goes at remunerative prices or at a slaughter. What is the remedy?"

"Well, first of all comes

Cold Storage.

If cool storage, at moderate rates, were only available in this, as in most other Colonies, the business aspects of the fruit industry would be all that could be desired. Growers would find that success in their enterprise would be practically assured — the gambling element would be eliminated. What we want is to extend the time for selling. Cool storage would enable the regulating of the supply; it would enable us to provide the market with fruit for several more weeks of the year. Indeed, if it would only help us over two or three days the benefit would occasionally be immense. Mangoes and pines, during a single night, in a hot place, such as our present Durban market house, often become almost unsaleable. With cool storage, of course, goes the providing of properly insulated railway vans. These vans, in the event of the shipping companies affording facilities, would take their contents to the ships lying alongside the wharves. Irrespective of shipping, however, such vans are most desirable, if not absolutely necessary, for sending fruit during the summer months

to Maritzburg, Johannesburg, Pretoria, Bloemfontein, and elsewhere. Excepting fish and meat, fruit is perhaps the most perishable of commodities ; as soon as it presents any signs of 'going off,' although practically sound, the drop is great, almost ruinous, I may say. When in good condition the beauty of fruit attracts. When not in good condition its appearance is repellant. The line between these two stages is a thin one. And while talking about vans, I may as well refer to the rough treatment our fruit consistently gets from the railway employees. The flinging, the chucking about the boxes and baskets receive is exasperating to witness. I remember one day in particular, when I had either personally packed or personally supervised the packing of some fruit intended for shipment to England, that I suddenly came upon the unloading of the van in Durban containing my consignment. The cases were pitched about as if they were so many whinstone boulders. I knew the damage that must result to my carefully picked and packed fruit. My disgust was intense, and failing to see any more rational outlet for my feelings, I let drive at the two porters nearest me. The white man in charge interposed, and then, so far as I was able, I relieved myself in words. About 45 is the degree of cooled air required for fruit, and, being so comparatively high, is in consequence cheaply produced. The cold necessary for meat and fish would immediately turn fruit black."

Shipping.

"As already shown in my pamphlet on the subject, certain coast fruits can be shipped to England even under the present conditions, with special attention. The close hold would, of course, be fatal. The small experimental lots I have sent — the fullest particulars were given in my pamphlet, now, however, out of print — were carried in deck cabins, exposed to the fullest current of air, and on most occasions placed in or near the cool chamber for a week or so while the ship was in the tropical regions —say from 30 degrees south latitude to 30 degrees north latitude. South Africa affords us an ample market for the present, if, as I have said, we were enabled by cool storage to spread our selling time over a longer stretch, but by shipping to Europe there is an opening for disposing of an enormous output. Our Coast fruits find a ready sale there, and we, being in the southern hemisphere, our fruit may be delivered when the northern supplies are at the lowest ebb."

Packing.

"Fruit for export packing should be cut a day or two beforehand, and exposed to the air, in the shade. This will remove the superfluous skin moisture, which is apt to produce a sweat if the fruit is packed immediately after the cutting. "Wood wool" is good as a packing material. Hampers are much preferable to cases, because they allow of a complete circulation of air. Fruit should be packed tightly, without, however, bruising the fruit. That fruit should be most carefully sized is a point always to be remembered by growers wishing to get the best price, and establish a good reputation for their case marks."

Concluding Remarks.

"You will have noticed that what I have said has a good deal to do with the future. As a European grower of Coast fruit I am sorry to say I can only speak at present in a depressing strain. The last three years, owing to drought, have been lean years for growers, white and black. But the black man, the Indian, has special advantages. His cheap mode of living makes it difficult for the white man to compete against him. The Indian has captured the kafir truck trade, and sooner or later will have the Coast fruit industry within his grip. The European is also handicapped in several minor but important ways. His labour requires constant and close supervision. An up-country farmer knows what to expect from his men engaged in ploughing, cultivating, etc., and a sugar grower finds task work easily practicable, but the fruit grower, whose work is of a varied and peddling nature, must always

have his men under his eyes. The Indian fruit growers, again, who employ a large number of kafirs, get them easily; they often advance kafirs a few pounds, and make the natives work the loan out at half the wages a white man is ready to pay. Why don't the whites do the same? Here is one reason: The kafir would bolt, and be lost; not so with the Indians, who have the faculty of tracing the bolter throughout the whole Colony, and beyond. If white men, however, go in for citrus trees, especially the naartje, they will have a pull over the Indian for a long spell, and although cool storage would greatly aid both, the chief benefit, for some years at any rate, would go more to the white man. To men who have what I may call gardening inclinations, fruit growing is a most attractive life, and the profits, although extremely speculative under the present conditions, are fairly substantial in good seasons."

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of March, 1901 :—

Name of Colliery.	Labour Employed. Above Ground. E.	N.	I.	Below Ground. E.	N.	I.	Coal raised. tons.	cwt.
Natal Navigation	14	80	97	10	301	89	10,073	15
Natal Marine	10	96	21	8	347	3	7,893	12
Dundee	14	33	103	12	146	299	7,574	15
Elands Laagte	11	17	107	9	140	209	7,485	13
St. George's	12	153	11	7	238	1	6,054	0
Natal Steam Coal	7	60	19	3	200	6	3,275	0
New Campbell	6	43	17	6	89	16	1,540	0
Newcastle	4	9	10	3	89	0	1,116	0
Inkunzi	2	10	0	1	40	0	603	16
East Lennoxton	1	0	10	1	2	13	380	0
West Lennoxton	6	3	0	1	7	20	288	0
Dudley			No Return.					
Crown			No Return.					
Total	87	504	395	61	1,599	656	46,284	11

Mines Office,
April 4th, 1901.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of March, 1901 :—

	tons.	cwt.
Coal Bunkered	17,986	4
Coal exported to Cape Colony	2,817	9
Beira	85	15
	2,903	4
Total bunkered and exported	20,889	8

Customs House, Port Natal,
30th March, 1901.

GEO. MAYSTON,
Collector of Customs.

The Advantages of Spaying Cull Dairy Cows, and how to do it.

THE dairy expert of the "Australasian Pastoralists' Review" writes :—On going round our dairy farms it may often be found that a lot of cows are kept, which not only do not pay for their own keep, but also eat up some of the profits which their mates give. What to do with these cows is a problem always preplexing the mind of the dairyman. When a cow comes in with only three teats, or another turns out to give only a very small quantity of milk, or to have some other fault, his first thought is to get rid of these. On further consideration he reflects that they will not be of any more use to anybody else than they are to himself, and he would not be able to sell them for anything like the amount of money they stand him in. He then thinks the best thing to do under the circumstances would be to fatten them. But then the bulls have been running with the herd, and even if they are not in calf already, they soon will be, as on very few farms is it possible to keep a few cows specially apart from all the others and the bulls. By the time they are fat the calf is pretty well matured, and they are of no use to the butcher. In very many cases the dairyman decides to sell these faulty cows as springers, puts them into auction sales, and says nothing about their faults. Sometimes even careful buyers are taken in with these cows, and when they again come into milk with their faults the same process goes on the following year.

The consequence is there are always a lot of cows which are next to useless as far as dairying is concerned, in our herds, to get clear of which there are only two ways open to the owner. He cannot milk them to advantage, nor when they are in calf can he get rid of them to the butcher. So he must either accept a price for them far below what he originally paid, or else he must take somebody else in with them. Apart from the fact that the latter alternative is un-British, and an undesirable system, the dairying community, as a whole, is in no better position. The faulty cows are still a drag on someone, and there is every probability of their continuing so under this system.

Now the natural end for a cow which does not milk up to the standard which her owner considers payable is to be killed for beef, unless, of course, she has some specially good blood in her veins, and her owner wants to rear calves from her. It is impossible to prepare her for the butcher if she is to be allowed to get in calf ; and, as the way our dairy farms are worked it is not convenient to keep a few cows separate from the bull, the only way to eliminate these cows from our herds is by spaying them. The risk from spaying is considered by experts to be very slight, and has been proved by them to entail a loss of not more than 2 per cent. Spayed cows fatten readily, and their beef is equal in quality to that of the steers. The best time to spay a cow is about six weeks after she has calved, and if she as managed to get in calf again before she is spayed it is almost a certainty, though not absolutely so, that the operation of spaying will cause her to abort. She will be quite herself again in a week or ten days after the operation, and with good feed will start to fatten right away. She is, when spayed, no more trouble than a steer, and as with steers, if her owner finds it necessary, although fat, to hold her over for a few months to await a good market, he can do so without fear of her getting in calf, and becoming unmarketable.

The universal adoption by dairymen of a system of spaying all cows which they know are not worth milking would prove a boon, not only to the individuals, by rendering their useless cows marketable, but also to the dairying community as a whole. If the so-called dairy cows, which are not really fit for the dairy, are prevented from breeding, it would seem that the only heifers reared would be those bred from the cows which

are really profitable to milk, and it is much more reasonable to suppose that heifers bred from the good milkers will turn out good milkers themselves than those bred from culls. So that any dairyman who, when he finds out a cow is a cull, spays her, gives himself a chance to get rid of her, and at the same time confers a benefit on the community by preventing her going on reproducing culls.

It is no more necessary to obtain the services of a qualified veterinary surgeon to spay a cow than it is to castrate a steer. In most dairying districts men can be found who can perform the operation in an expert manner. The cows to be operated on should be kept for twelve hours without food immediately before the time the operation is to be performed. An ordinary milking bail is quite sufficient to hold dairy cows. A sapling or piece of quartering tied to the bail, and extending along the off side of the cow can be held by a man standing some feet behind her, and will keep her quite secure. It is a mistake to tie a cow up tight with ropes, as directly she finds she is fast she will try to lie down. Perfect cleanliness should be observed during the performance of the operation. A bucket of water with some disinfectant should always be handy to keep the hands and the wound thoroughly cleansed. The incision is made in the triangular hollow between the last rib and the hip, and should be about 4 inches long and about parallel with the last rib. When the hide is cut through the muscles are nicked until the transverse muscle, which may be known from its name and the transverse way in which it runs, can be observed. Then the hand should be bored through the rest, care being taken with the inside lining known as the peritoneum, which is elastic, and may recede from the hand. It will be known when this has been bored through from the fact that the air rushes in, and causes an unmistakable sound.

The next thing is to find the ovaries, which may be done by pushing the hand back, as if between the two hips and close to the backbone. This may be followed along backwards, until the hand is in a sort of pouch, known as Douglas's pouch. Then the womb will be immediately under the hand. By bringing the hand forward the womb will be found to divide into two spiral-like structures, called coruna, or horns. These are supported by a tough membrane called the broad ligament, just at the end of which and at the end of each horn will be found the ovary, a small hard substance, varying from the size of a pea to that of a pigeon's egg. When the one ovary is found the long curved spaying knife may be inserted with the other hand, and by holding it in one hand and cutting with the other the ovary is cut short off. The same is then done with the other. Care should be taken in sewing up the incision to only take in the hide. Plenty of Stockholm tar, mixed with grease to prevent it from blistering, may be used, and the stitches will fall out in due course by themselves. A very good plan for any man intending to try spaying is to give himself a few lessons by carefully examining the anatomy of a cow which has died or been killed.

The "Pieter Faure's" Operations.

TRAWLING IMPOSSIBLE ON THE NATAL COAST.

THE Cape Government trawler "Pieter Faure," which was lent to the Natal Government for the purpose of testing the Natal Coast, has completed her work, says the "Mercury," and returns to the Cape in a few days. The vessel arrived here on December 11, and started operations a couple of days after. The work consisted of examining the ground out to the 100-fathom limit, successful trawling only being possible up to this depth. The "Pieter Faure" made

a beginning off the Bluff Lighthouse, and worked up the coast in a zig-zag fashion, coming in to the land, and then going out again to the 100-fathom depth. Soundings were taken every mile. The furthest northerly point reached was Cape Vidal, 135 miles from Durban, while on the south side the trawler worked as far as the Umtamvuna, 85 miles from the Bluff Lighthouse.

We learn from Capt. A. Turbyne, master of the "Pieter Faure," that the 100-fathom limit varies on our coast from six miles to twenty-seven miles from the shore. The former is the distance of the limit from Durban, while the latter distance divides the limit from the shore at the mouth of the Tugela. For trawling purposes a clear, smooth bottom is essential. Rocky ground tears the nets, and trawling is consequently impossible. The result of the "Pieter Faure's" operations is that the whole of the Natal coast has been found to be unsuitable for trawling. It was only at the mouth of the Tugela that a few small patches of good muddy ground were discovered. On this ground some soles were found, but, although they were in fair quantity, they were too small to be of commercial value. Three species of the same kind of fish were found just off the Umhlanga Beach, 11 miles north of Durban. The trawling ground at the Tugela was found between a point a little to the south of the river, and the Tenedos Shoal, north of the Tugela. The temperature over this area varied from 63 degrees to 73.7 degrees at the bottom. The surface temperature averaged about 82 degrees. It is difficult to say what is the reason of the absence of fish on this ground. The Natal coast, with the exception given, being of a rocky nature, is an impossible ground for trawling. Samples of the ground, and specimens of the fish found on the coast, have been sent to Capetown for examination by Dr. Gilchrist. It is disappointing to learn that our coast is unsuitable for trawling, but, even if we have only learnt this, the work of the "Pieter Faure" has not been in vain. It must not be concluded, from the result of the operations of the trawler, that there are no fish along our coast. The experience points rather to the fact that the fish are on rocky ground, and the only way to catch them is by steam hand lines, as is now being successfully done.

The "Pieter Faure" proceeds to East London, where she will trawl, for scientific purposes, at depths of 100 and 500 fathoms.

Sugar-Cane Experiments in Barbados.

THOUGH the sugar-cane has been cultivated in tropical countries for centuries it was only about ten years ago it was discovered that the plant produced seeds. Previously it had been grown only from cuttings, and it was not possible to obtain any great improvement in the varieties of canes. With the discovery of the seeds it was immediately realised how it would be possible, by selection and cross-fertlization, to vastly improve the quantity and quality of cane sugar. This has been a subject to which the Imperial Department of Agriculture has given a great deal of its attention, and during the past season important experiments have been conducted in Barbados by Professor d'Albuquerque, Honorary Consulting Chemist to the Department, and Mr. Bovell, Superintendent of the Botanic Station, to test the commercial value of various descriptions of seedling and other sugar canes, with the object of assisting the planters in selecting the canes most suitable and profitable. The extreme varieties of soil and climate, typical of comparatively large areas in Barbados are high red soils and low black ones, and between these two come every intermediate variety, so it is obvious that some canes would be more productive in one locality than in another. The cane most favoured by the planters recently is the white transparent, and this has been adopted as the standard for comparison. An arrangement was made by which the canes to be used for the investigation were

to be grown, not on experimental plots in the Botanic Gardens or in artifically prepared soil, but on seven different estates distributed over the island, "grown by the planters themselves under exactly the same conditions as other canes. There was nothing exceptional in their treatment. Hence the results may be regarded as fairly typical of the locality in which they were grown. Fifteen selected varieties of sugar cane were compared on five black soil estates, and ten varieties on two red soil estates. Each variety was alloted a plot of 100 holes, and at nearly every station there were two series of the varieties, so that there were two plots (duplicates) of each variety, serving to show at each station, on the field chosen, the variation to be expected with each variety from one part of the field to another. Finally the crops when reaped had to undergo identically the same treatment at the hands of the investigators, and the results have proved extremely interesting. Valuable tables have been prepared, showing for each variety in the black and red soils, separately, the quantity, in tons per acre, of canes and of tops; the percentage of juice produced by mill; the pounds per gallon of saccharose, of glucose, and of solids not sugar; the quotient of purity; the juice, in gallons per acre; the saccharose, in pounds per acre; and the sugar, in tons per acre. With such results as these tables show there is no hesitation in deciding which is the best all-round cane for Barbados, but the Imperial Commissioner of Agriculture, knowing from experience how reckless the planters have been in the past in going in for extensive cultivation of a particular cane because it has been profitably grown somewhere else under totally different conditions of soil and climate, advises the planters, in the first instance, to select three or four only of the most promising canes, which have now been experimented with and which may be likely to suit their district, and finally, to adopt the variety which steadily stands the test of local conditions. With 100,000 acres of land under cultivation it is obvious that, if the introduction of an improved variety of cane ensures an increased yield of even only a quarter-of-a-ton of sugar per acre, the planters and the island generally would derive immense benefit from the change.

Agriculture in Queensland.

STATE ASSISTANCE.

THE annual report of the Department of Agriculture of Queensland indicates the thoroughness of the State supervision of agricultural industries in the province. In order to pave the way for agricultural settlement, and attract farmers and their families from the old world, skilled experts have been appointed in various branches to study the conditions under which the farming interests may be carried on, and there are now the following Government officials:—Agricultural Chemist, Colonial Botanist, Entomologist, Instructor in Fruit Culture, Viticulturist, Tobacco Expert, and Instructor in Coffee Culture. There are four State farms in different parts of the Province, a Government Agricultural College, and a Sugar Experiment Station at Mackay. Government Veterinary Surgeons also are attached to all the meat export depôts to examine the stock killed.

A farmer sends the following to the *Free Lance*:—"I see that an enterprising pork butcher has made a corner in the Royal pigs by buying the whole of the Queen's fat swine from the Flemish Farm in Windsor Great Park. A good many years ago I had some business transactions with the Queen's bailiff at the Norfolk Farm, and on one occasion I remember meeting a butcher from the neighbourhood of Slough who gave such an enormous price for Her Majesty's porkers that I ventured to ask him how he could afford to give such large sums for the animals. 'You see, sir,' he answered quietly, 'the Queen's pigs have such a lot of legs!' And he softly drooped his eyelid."

Sheep Statistics.

Returns showing number of Sheep on 31st December, 1900 :—

District Vet. Surgeon.	Stock Inspector.	Division.	Owner.	Clean.		Infected. with Scab.		Total.		Total Sheep.
			European or Native.	No. of Flocks.	No. of Sheep.	No. of Flocks.	No. of Sheep.	Flocks.	Sheep.	
Hutchinson, F.	Marshall, A. J., act.	Newcastle	E.	25	19,670	12	23,310	37	42,980	43,600
			N.	2	60	1	560	3	620	
"	Marshall, R.	Dundee	E.	12	9,258	27	17,850	39	27,108	27,185
			N.	6	77	...	...	6	77	
"	Wright, W.	Klip River	E.	15	8,157	11	16,404	26	24,561	24,901
			N.	3	251	1	89	4	340	
"	Klingenberg, A.	Umsinga	E.	13	3,810	...	...	13	3,810	7,561
			N.	292	3,751	...	...	292	3,751	
"	Freer W.	Upper Tugela, portion N. of the Tugela R	E.	11	4,159	...	...	11	4,159	4,353
			N.	10	194	...	...	10	194	
Webb, J. L.	Gray, W.	Upper Tugela, S. Tug. R., and Estcourt, North of Bushman's R.	E.	29	10,897	...	...	29	10,897	11,012
			N.	3	115	..	...	3	115	
"	Wilkes, B.	Estcourt, bet. B. R. & Lr. Tugela R.	E.	37	26,730	2	748	39	27,478	28,376
			N.	30	898	...	...	30	898	
"	Button, J.	Estcourt, S. of Bushman's R.	E.	127	88,886	3	2,252	130	91,138	91,211
			N.	2	73	...	...	2	73	
"	Ball, A. H.	Weener	E.	19	7,198	2	500	21	7,698	7,698
			N.	...	...	...	...	...	...	
Cordy, C. H.	Varty, E.	Umvoti, W. portion	E.	60	33,504	3	2,025	63	35,529	35,529
			N.	...	...	...	...	...	...	
"	Perfect, G. N.	Umvoti, E. portion	E.	34	20,108	1	963	35	21,071	21,165
			N.	2	94	..	...	2	94	
"	Parkinson, A. S.	New Hanover	E.	12	3,590	...	..	12	3,590	3,958
			N.	12	368	...	...	12	368	
"	Van Rooyen, F. E	Krantz Kop	E.	26	8,090	...	...	26	8,090	8,090
			N.	...	...	...	...	...	...	
Byrne, J. P.	Hosking, E. J. B.	U. Umkomanzi	E.	24	13,744	2	950	26	14,694	14,961
			N.	6	267		...	6	267	
"	Hair, A.	P.M.Burg and Umgeni	E.	9	2,636	...	...	9	2,636	4,107
			N.	55	1,471	...	...	55	1,471	
"	Hodson, J. J.	Lion's R.	E.	119	61,652	3	1,810	122	63,462	63,462
			N.	...	...	...	...	...	...	
	Robbins, W. C.	Lower Tugela and Mapumulo	E.	...	...	...	...	...	...	Nil.
			N.	...	...	...	...	...	...	
	Swales, J.	Indwedwe and Inanda	E.	...	...	...	...	...	..	74
			N.	2	74	...	...	2	74	
Verney, F. A.	Wilson, W.	Polela	E.	92	59,984	...	...	92	59,984	62,022
			N.	47	2,038	...	...	47	2,038	
"	Foster, W.	Ixopo	E.	43	38,811	1	1,070	44	39,881	40,785
			N.	12	733	1	171	13	904	
"	Raw, R. J.	Impendhle	E.	50	47,173	3	2,700	53	49,873	50,594
			N.	17	721	...	...	17	721	
"	Hutchinson, W. A.	Alfred	E.	25	15,679	...	...	25	15,679	18,336
			N.	84	2,422	3	235	87	2,657	
Amos, S. T.	Morrison, J. A.	Durban and Umlazi	E.	...	...	...	...	...	...	Nil.
			N.	...	...	...	...	...	...	
"	Shooter B. C.	Alexandra	E.	8	430	...	...	8	430	430
			N.	...	...	...	...	...	...	
"	Klüsener, B.	Lr. Umzimkulu	E.	1	65	...	...	1	65	100
			N.	2	35	...	...	2	35	
"	Gielink, G.	Prov. of Zululand	E.	6	2,257	...	...	6	2,257	2,257
	"	"	N.	...	...	...	...	...	...	
			Totals	1384	500,130	76	71,637	1460	Total	571,767

NOTES ON SHEEP STATISTICS.

Total number of clean sheep as shown by returns ...	1,384 Flocks	500,130 Sheep.
Total number of sheep infected with scab ...	76 „	71,637 „
Total number of sheep in the Colony ...	1,460 „	571,767 „

Since issue of last Returns, Stock Inspectors Marshall, A. J., Marshall, R., Wright, and Klingenberg have returned to their Districts.

They have a total of Sheep as under :—

Clean Sheep	368 Flocks	45,034 Sheep
Sheep infected with Scab... ...	52 „	58,213 „
Total	420 „	103,247 „

This leaves a total in the same Districts as shown on 30th June, 1900, as under :—

Clean Sheep	1,016 Flocks	455,096 Sheep
Infected Sheep	24 „	13,424 „
Total	1,040 „	468,520 „

This shows an increase of 83 Flocks—14,930 Sheep.

Increase in the number of clean Sheep 59 Flocks—25,099 Sheep.

Decrease in Sheep infected with Scab 14 Flocks—10,169 Sheep.

The prevalence of Scab in the Divisions of Newcastle, Dundee, and Klip River is due to the number of diseased loot Sheep brought into the Colony.

M. J. HIME.
for Principal Veterinary Surgeon.

Principal Veterinary Surgeon's Office,
2nd April, 1901.

SHEEP ENTERED AT DIPPING STATIONS.

Return of the number of Sheep that have entered the Colony at the undermentioned Dipping Stations during the six months ended 31st December, 1900 :—

Dipping Station.	Number of Sheep.
Coldstream	Not known
Indawana Drift	*684
Hancock's Drift, Umzimkulu	3,606
Van Reenen's Pass	2,412
Total	6,702

*515 of these Sheep were imported for slaughter.
169 „ „ „ „ farming in Ipolela Division.
684

M. J. HIME,
for Principal Veterinary Surgeon.

Principal Veterinary Surgeon's Office,
2nd April, 1901.

Veterinary Departmental Report for February, 1901.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

NOTHING of a very noteworthy nature has transpired departmentally during the month. District Veterinary Surgeon Hutchinson's report from Newcastle is again worthy of notice, as instancing the difficulty of suppression of contagious disease under the disturbed conditions now existing in the northern part of the Colony. You will notice that, in addition to the herds now under licence, as many as ten fresh outbreaks have taken place within the month. Mr. Webb's is an interesting and educational report which I should like to see published *in extenso* if space permits.

During the month of February an analytical report upon the water supply of Harrismith has been furnished to the military authorities.

From the Laboratory quarter-evil vaccine, to the number of 670 doses, has been issued; locust fungus, 144 tubes (of this preparation the Inspector reports "splendid results are developing from immersing"); mallein, 1,022 doses; anti-streptoccic serum, 6 doses; snake-bite serum, 2 doses.—I have, etc.,

H. WATKINS-PITCHFORD,
P.V. Surgeon.

MOOI RIVER—D.V.S. WEBB.

Biliary Fever.—Three imported Shires developed this disease a few days after their arrival. The extreme change from an English winter to the height of a Natal summer, the heat at the time being particularly excessive, probably acted as a predisposing cause to the disease, and rendered the horses' systems specially susceptible for its development.

The horse whose temperature reached 107·6° F. developed enteric complications, to which he succumbed. One of the others developed a cough, together with a purulent mucous, sanguinous, and slightly fœtid discharge from the nostrils. These symptoms were treated with medicated steam inhalations and pot. iodide internally. This animal, together with the other, after a protracted illness, eventually recovered, and they are now quickly recovering their condition.

The symptoms were high temp. reaching 107·6 degs. F. in one, 107 degs. F. in another, and 106·6 degs. F. in the third, quickened respirations, rapid pulse, visible mucous membranes, varying from an orange to a yellowish-white colour, and no appetite.

The treatment I used was to place the horses in as cool a situation as possible, namely, under shady trees, tempting them to eat any suitable food, and giving oatmeal gruel, thinned down with water, to drink in lieu of plain water. Medicinal treatment consisted in administration of febrifuges and stimulants, followed by tonics and potassium iodide.

Actinomycosis in a Colonial Ox.—The disease had affected one side of the jaw, on which were three growths, consisting of granulation tissue, the largest being about the size of one's fist. On excising these growths, I found each connected with a sinus containing pus, and running into the bone, which was implicated to a considerable extent. After excision I freely used the actual cautery and biniodide of mercury ointment, and pot. iodide internally. This course has, I believe, proved successful.

Lead and Zinc Poisoning.—Six head of cattle have, to my knowledge, died through eating these metals during the month. A description of symptoms and antidotes I described in the *Agricultural Journal.*

Choking in a Heifer.—The cause of the obstruction I was unable to discover, as it was in the thoracic portion of the œsophagus, and as I could not return it through the mouth I pushed it on into the rumen. The heifer recovered.

Vegetable poisoning in two eight months' old calves. The actual poison I was unable to determine, but from the symptoms shewn, it was evident the animals had ingested some irritant poison, probably obtained from the veldt. They were treated with anodynes, but whether successfully or not I have not heard.

Pleurisy and Hydrothorax. — The racing pony "Patchwork" succumbed to these diseases after an illness extending over five weeks.

Balanitis or Inflammation of the Prepuce in a Colonial bull terminated favourably after a course of antiseptic injections and lead lotion.

Post-Parturient Paralysis in a Heifer. —Recovered after irrigating the utreus several times daily with antiseptics, and the internal administration of nux vomica.

Pyarmic Arthritis or Joint Evil in Calves.—This disease made its first appearance last season on a farm near Estcourt, and cases have again occurred this summer. The disease attacks calves when they are about a month old. The calf is first noticed lame, and on closer examination one of the joints is seen to be swollen, hot and painful. There is also an amount of systemic disturbance. After a time supperation takes place within the joints and abscesses form. Usually the animal succumbs to the disease, but in few cases they live, the joint becoming anchylosed.

The treatment which I have advised is to blister the diseased joints with biniodide of mercury ointment, and the internal administration of Donovan's solution. Whether any good results have been obtained after the application of this treatment or not I have not heard. As a predisposition to this disease is probably hereditary, I recommend a change of bull.

Scirrhous Cord, probably caused by discomyces, in an ox. The scrotum was greatly enlarged and shewed several supperating points, also a mass of granulation tissue attached to its apex. The disease was so far advanced that an effectual operation would have been attended with tremendous loss of blood, so I recommended the removal of the granulation tissue by ligation, and that a solution of iodine should be injected into the scrotum through the supperating points, and pot. iodine given internally. Up to the present I have not heard what effect the treatment has had.

Lymphangitis in a Cart Mare.—This disease, locally known as farcy, weed, shot o' grease, and Monday morning disease, the latter name from its often developing during Sunday night through the horse having been tied up and so getting no exercise from the time he finished work on the Saturday until required again on Monday morning. In consequence of one attack predisposing to another, and want of exercise being an inducing factor, horses subject to this disease should always be placed where they can exercise themselves when not at work. If this precaution, together with a few others, such as not to place susceptible animals on a too sudden change of diet, and an occasional dose of physic were taken, the disease would be kept in check. Each attack of lymphangitis leaves an amount of plasma in the lymphatic spaces, this coagulates and fibrin is formed, leaving the leg or legs more enlarged each time, until a condition known as elephantiasis (resembling an elephant's leg) is produced. Lymphangitis is generally ushered in with a shivering fit, which subsides when the swelling of one or more of the legs commences, usually a hind leg. Acute pain is evinced when pressure is applied to the inner aspect of the thigh. Swelling gradually involves the whole leg, the temperature rises a few degrees, and the pulse becomes quick and full. This disease, although of a somewhat alarming appearance, practically always subsides if the patient is placed on a simple diet and allowed no corn; the leg should be fomented with hot water and an anodyne liniment afterwards applied, an alœtic ball should be given, followed by diuretics as nitrate of potassium and deobstruents as potassium iodide. When the pain has subsided gentle exercise is beneficial.

Rheumatic Arthritis in a Bull, affecting the fetlocks and knee joints. This animal quickly recovered after a course of sod. salicylate ½ oz. twice daily in gruel.

Horsesickness.—An aged gelding, after being ridden from Estcourt to Mooi River, developed this disease and died in a few hours after the first symptoms were noticed.

Dik-kop in a Carriage Horse.—The day before I was called in the horse had been driven about twelve miles. In the evening he was noticed sick, and on the following morning appeared worse. I attended the horse on the evening of the second day, but I did not attempt any treatment, as the disease was too far developed. He died that night.

Diseased Sacrum in a Cow.—The cow was noticed to have a staggering gait and could not stand for long at a time. A hard swelling with a sinus wound and a foetid discharge appeared over the region of the sacral vertebrae. This I opened up and removed several pieces of dead bone, afterwards having it syringed out daily with antiseptics and applying iodoform. The case did well.

Inflammation of the Prepuce and Penis in a bull. This animal's penis for at least a foot was in a most fearful condition ; it was swollen, and large portions of necrosed tissue could be detached. The prepuce was also inflamed, and a foetid discharge issued from the opening. Treatment consisted in removing all necrosed portions and applying a strong solution of silver nitrate to the unhealthy looking tissues, together with frequent antiseptic irrigations.

Lungsickness.—One outbreak at a Kafir Kraal. The Stock Inspector not being satisfied as to the nature of the disease, asked me to inspect the cattle in order that a definite conclusion could be arrived at. The disease proved to be lungsickness.

Old Wound on a Coronet.—In this case a condition arose due to insufficient care having been taken when the wound occurred. As is often the case the granulation tissue which fills up a wound grows quicker than the new skin, and as a result often rises above the level of the surrounding skin, constituting what is generally known as proud flesh. If this condition is allowed to take place, what was primarily a simple wound, becomes an unhealthy looking mass of granulation tissue. To prevent this state of affairs it is necessary to keep the granulations below the level of the skin by means of caustics, and so give the new skin a chance to gradually cover the wound. When the condition already referred to has occurred, it becomes necessary to again place the wound in its primary state, and the best means to do this is to burn away all the granulation tissue, taking care not to touch the skin, then after the sloath, produced by the burning, has been removed, to treat the wound as before advised, namely, keep the granulations down with caustics, and so give the new skin a chance.

Other cases treated during the month:—

In Horses.—Irregular teeth, curbs, catarrh, injured cornea and stomach staggers.

In Cattle.—Redwater in Colonial heifer and an imported Devon bull. Both died.

In Sheep.—Worms.

HOWICK—D.V.S. BYRNE.

Umgeni Division.

In the Umgeni Division, I regret to have to inform you that lungsickness broke out in a herd of eighteen, the property of M. T. Dawson. These cattle have been quarantined in a portion of Mr. Sutton's farm, Zwaartkop, but where they have come from I do not know up to the present ; Stock Inspector Hair is making enquiries. With the exception of the above outbreak, this Division is at present clean.

Lion's River Division.

I have two outbreaks of scab to report this month. The first is in a flock of 482, the property of Mr. J. Morton, Tweedie Hall, and the second in a flock of 320, the property of Mr. Jas. King, Lyndoch. Twenty-two head of cattle, the property of Mr. E. Harris, of the farm Mount Merbie, were released from quarantine on February 5th, 1901, in the Upper Umkomanzi Division. I have had a rather large number of horse-sickness cases in my District during the month.

IXOPO—D.V.S. VERNEY.

Sheep Scab.—There is less of the disease than there has been for a considerable time.

Contagious Pleuro-pneumonia.—Two outbreaks of this disease have occurred during the month. One at Mr. Eglestone, Coleford, on the Griqualand-Polela road, the other at Mr. Crossley's, Deepdale, on the Bulwer-Maritzburg road. The cattle belonging to Mr. Eglestone are badly infected, and I am afraid he will be a heavy loser. Mr. Johnson is the only stock-owner under license for this disease in the Ixopo Division.

NEWCASTLE—D.V.S. HUTCHINSON.

Lungsickness.—This disease still continues very prevalent, especially in the

Newcastle and Upper Tugela Divisions, due in a great measure to the large herds of cattle which are being continually introduced into Natal from the new Colonies for the purpose of being traded in exchange for horses. The result is that the majority of the animals break out with the disease shortly after their owners get them to their farms. The names of people to whom cattle are being issued by the military are now being taken, and the destination of the animals ascertained.

There are ten fresh outbreaks reported in Newcastle, four in Dundee, three in Umsinga, and nine in the Upper Tugela Divisions.

Scab.—Owing to the existence of scab amongst them, the whole of the sheep sold at the military sale held at Newcastle on February 22nd have been placed under license, and will not be allowed to leave the District until declared clean by the Stock Inspector.

Eleven flocks have been placed under license in the Newcastle, two in Dundee, and one in Umsinga Division during the month.

Redwater.—A great many cases of this disease among captured cattle brought into the Colony from the high veld have come under my notice.

Horsesickness.—Isolated cases of the disease continue to be reported from all parts of my District. Out of fifty animals left behind in Dundee by the Composite Regiment, three deaths have, so far, occurred from the disease.

Although numerous requests have been made for my services during the month by private owners of stock, I am sorry to say that I have been unable to give them attention.

DURBAN—D.V.S. AMOS.

Glanders has been especially reported upon as far as the outbreak in Mr. Douglas' stable is concerned. One other isolated case has been destroyed and confirmed by *post-mortem* examination.

Tuberculosis.—Nine cows have been tested, and no reaction given.

Horsesickness.—No cases have come under my personal notice, but the Corporation tram stables report four cases.

GREYTOWN—D.V.S. CORDY.

Scab.—A fresh outbreak has occurred in the flock of Messrs. T. J. and C. M. Botha, of Welverdient. This was not reported by the owners, which is to be regretted, as it was thought that this county was free from scab at the end of last month.

Lungsickness. — No fresh outbreaks have occurred during the month, but the herd of Mr. E. Bentley, of York, and that of Native Lugi, of Blinkwater, are still in quarantine. In Mr. Bentley's troop three cows are still suffering from the disease, and four other head of cattle, which have made a so-called recovery, are looking somewhat suspicious still. Had the diseased animals been destroyed in the first instance, I think it more than probable that the farm would have been out of quarantine now.

Gallsickness has been prevalent among cattle in the Eastern Umvoti District, and blue tongue has caused many deaths among sheep in the Western Umvoti District.

The work of the month included the treatment of the following cases in the horse, viz. :—Bilious fever, pneumonia and pleurisy, laminitis, two cases of sore throat with fever, ophthalmia, chronic indigestion, and various other ordinary cases such as occur in every day practice.

A report from Vienna is to the effect that one of the scientists there has discovered that the bacteria in milk may be easily killed by means of electricity, and a very moderate current at that. It is declared that the treatment is simple. This is of immense value to the human race, if true. It means that milk can be sterilised without the application of heat. It would not only place in the hands of dairymen the means of making better butter, but it would make the pasteurisation of the private milk supply popular, thereby decreasing all the diseases whose germs are carried in the milk.

The sale of a horse by means of photography is reported from Ireland, the Macalister Stud in Missouri having bought the young stallion Laurium, by Rightaway, without having seen him, except in the guise of a photograph, which was shown to Mr. McAlister's agent by Mr. Joseph Osborne, the veteran author of the "Horse Breeder's Handbook." Mr. McAlister was so struck by the photograph, that, upon hearing the horse was a fair performer on the turf, he at once secured him and had him shipped to New York for his stud in Missouri, which comprises thirty mares, a third of which are by the best English sires.

Agricultural Instruction in Germany.

THE Director of the Superior School of Agriculture at Berlin, Herr Delbruck, recently spoke before the Emperor upon the subject of agricultural instruction. He first pointed out that the institution under his control was divided into three great sections—(1) agriculture; (2) a department which includes drainage and irrigation, plane drawing, and agricultural engineering; and (3) technology which deals more immedialy with certain industries allied to agriculture, such as the distillery, sugar production, malting, and bread-making. Agriculture itself is divided into nine sections, the chief of which are physics and meteorology, chemistry, geology and mineralogy, botany, zoology, and cultivation. There are well-equipped laboratories, a remarkable library, a suberbly complete museum, and a well-arranged experimental field, in part covered by glass. Herr Delbruck expressed his hope that the section of technology would be assisted by the generosity of leading men engaged in the various industries to which the work related to the extent of a million marks. Now it is worthy of notice that no fewer than 1,400 persons annually pass through the amphitheatre of the Superior School of Agriculture, and that as between the staff and various societies of agriculture more than 13,000 persons engaged in practical work have been authorised to make researches at the School. It was pointed out by the speaker that the population of Germany had trebled during the past century, and that is promises to double during the century which had just commenced. During the last hundred years agricultural production has quadrupled, and it is therefore essential that during the coming century it should double itself in order to respond to the requirement of a constantly increasing population; and, just as the production of food on the farm must augment, so, he pointed out, must there be an increase on the part of those industries which are allied to agriculture, such as the sugar factory and the distillery. One or two further remarks may be referred to as showing the views which are held by many leading scientific men. "Model farms," said Herr Delbruck, "have had their day; at this moment it is the experimental work on the land which is necessary." The art of instituting research work is well understood, but it has become essential to attack important questions on a commensurate scale. Agricultural bacteriology will in the future play a preponderating *rôle* in the process of cultivation, and how can the results obtained in the laboratory be better applied in experimental practice than by striving for the solution of great questions upon an experimental farm? In one sense, it was pointed out, the investigator should be the professor; but, added Herr Delbruck, there are limits beyond which the scientist, who is isolated, finds himself paralysed, as much on account of that which concerns his strength as his knowledge. Indeed there are some forms of work which can only be executed in collaboration with other men of science who are devoted to other branches of their work. The individual charged with the conduct of an experimental farm must necessarily subordinate himself to those who, combined perhaps under one head, alone know precisely what they want to obtain. In this sense the experiment farm must become an object of study for numerous investigators simultaneously working from divers points of view but with one common object. Professors of agriculture and zootechny must not fear to descend from their chairs in order to put their theories into practice; they will in this way gain confidence in themselves and at the same time they will inspire confidence among practical men. But it is also essential to consider that a professor of agriculture, divested of all personal responsibility in regard to practical farming, will remain, and must necessarily remain, a simple theorist in the eyes of farmers.

During the last ten days of June, 1891, the heat in Calcutta was unusually great, and no fewer than a hundred horses belonging to the tramway company were struck down by the sun, a large proportion of them dying from the effects, this in spite of the fact that the horses wore, as is usual during the hot weather, pith hats, that protect the poll and the upper part of the neck from the sun,

Dairying in Australia.

THE HON. F. R. MOOR'S IMPRESSIONS.

IN reply to a request for some information about dairying in Australia, Mr. Moor said :—

"While in Australia I gave as much attention as my time permitted to the subject of dairying and all connected with it. I made numbers of notes as the results of my observations and enquiries, but on looking through this pamphlet of Messrs. Wilson and Crowe, the Dairy Experts of the Agricultural Department of Victoria, and kindly given me by the Chief of that Department, I find that it presents all I can say more fully and effectively. It is the outcome of the experience of two thoroughly competent men. The vitality and the progress of the Victoria dairy trade are eloquently shown in the official figures. In 1889-1890 the butter exported amounted to 399 tons, valued at £51,300 ; in 1899-1900 the butter exported amounted to 17,607 tons, valued at £1,604,600. The cattle of Victoria are finely bred, the Shorthorn strain predominating. The Jersey and Ayrshire breeds are also popular. Making allowance for the difference of local conditions, which presumably the readers of the *Agricultural Journal* are capable of doing, the most of the pamphlet, if republished in the *Journal*, will be found to afford much matter of interest and instruction."

Practically the whole of the pamphlet will be published in instalments.

The following is the first instalment :—

Rules for butter-making could easily be drawn up if the conditions under which each butter-maker laboured were alike. If the milk were in the same order, the climatic conditions identical, and like appliances used, it could readily be disposed of. The conditions in different localities and places vary. The circumstances are constantly changing in each place. It would be of little advantage, therefore, to frame rules without pointing out a method of applying them. More good will be derived from a general discussion of the subject. The subject will be shown from different stand-points, and it is hoped that in such form it will prove of the best service.

The quality of butter largely depends on the treatment of the milk before it reaches the factory or creamery, and the condition of the milk when it reaches the butter-maker's hands.

The Care of Milk.

Milk should be drawn from the cows in as cleanly a manner as possible. The surroundings should also receive due attention.

It is a pleasure to notice the recent rapid increase of modern well-drained and paved milking-yards ; together with well-arrrnged and ventilated milking-sheds.

Examples can be met with in every district that serve as models for the neighbours to copy. When yards are convenient in their arrangement and paved it is easy and pleasant to work in and keep them clean.

Milk is a great absorbent of bad odours, and a good medium for the development of bacteria. If the surroundings be evil-smelling the milk will soon become tainted. The value of butter, therefore, becomes lessened as the contamination is permitted to increase in the milk.

If a cow's udder is dirty it should be carefully washed, and if clean it should at least be wiped. Such simple precautions prevent filth and dust from falling into the bucket when milking. Milking with dry hands is preferable, and is fast coming into favour. It is a much cleaner and better plan than the old way.

Milk should be kept in a clean place shaded from the rays of the sun, and away from dust and smells.

The milk vessels and everything that the milk comes in contact with should be absolutely clean. The temperature of the milk should be reduced as rapidly as possible after it comes from the cow.

When the milk is strong in odour and flavour from such food as fresh green rape, lucerne, trefoil, turnips, &c., aeration greatly improves it.

The aeration of milk has long been advocated ; but because it was imperfectly understood, or entailed a certain amount of trouble, but few dairymen practise it.

Milk that is quite nauseous to the taste, and gives off a strong undesirable odour from the above causes, can be made quite agreeable and palatable by aerating. The fact that the odour rises from the milk is proof that the element causing it is volatile. If pure air is passed through the milk, or if milk is spread out thinly and exposed to such air, the undesirable element evaporates and is carried away. A simple experiment may be more convincing than any lengthy explanation. When the milk is affected take a cupful and pour it a few times from one cup into another. In doing so let the milk fall some distance through the air. After this is done a great improvement will be noticed. The same thing may be done by means of dippers or buckets; but when large quantities are handled special appliances have been designed—and are in the market—for effecting the object. The process is greatly assisted if carried out when the milk is at a high temperature immediately after coming from the cow.

Recent experiments have been made to find out if it were possible to eliminate this injurious element at the creamery instead of the farm. Considerable success was met with, and the matter is dealt with elsewhere under the head of "Pasteurizing."

Farmers reason in the following manner:—"My milk is considered good enough to be taken at the creamery without my going to any bother with it, and anything that is considered good enough to receive there is quite good enough to send."

Again:—"If I put my milk in the best condition, and make it most suitable for manufacturing a tip-top quality of butter, and my neighbour does not, my good work is negatived by his carelessness as soon as our milk is mixed at the creamery. He gets as much for his product as I do who supply a superior article."

This contention applies to all milk inferior in condition, as well as from the neglect of proper aeration when necessary. This is really the weakest point in our otherwise excellent co-operative system of dairying.

It has often been suggested that the remedy rests with the companies; that they should extend the system of payment by results, and pay for the milk according to the condition as well as according to the butter contained.

Many difficulties present themselves in the carrying out of such a proposal. The chief obstacle is the want of a definite measure of the suitability of milk for butter-making at the time of its delivery at the factory. The determinaion of respective values would have to be placed entirely in the hands of the manager, and applied at his discretion.

As his employers are generally suppliers and are often offenders, undesirable friction would sometimes be caused if the manager did his duty. Of course the same argument was put forward when the system of payment according to butter contents was initiated, but the cases differ considerably. In the one instance there is great definiteness in the result, which can be checked if a doubt arises. In the other no such precision exists. It was at one time suggested as practicable, in cases of dispute, to have the question settled by a board of reference from the suppliers present at the moment. Such a course would in many cases—if not all—take the responsibility off the manager's shoulders, but could not give ultimate satisfaction. The sole power of exercising judgment should be vested in the manager's hands.

Authority is given at present in nearly all places for the manager to refuse to take delivery of milk unfit for the making of good butter, but the line in 90 per cent. of our factories is drawn too low.

If milk will pass through the separator it is generally considered good enough to take, and sourness, or the degree of sourness, is the only point taken into account in some places in determining the suitability of the milk.

Very often milk which is too sour for separating is better suited for making a good butter than another class of milk which has been tainted through having been kept in unclean surroundings, or in dirty vessels. This is the class of milk that causes most damage in the factory. It often arrives sweet to the taste, but having a bad odour.

Such milk is responsible for far more trouble and deterioration in the finished product than milk that has naturally soured through being kept at too high a temperature. It is that class of milk that presents the greatest difficulties in determining its value.

There is another phase of the subject, and one that presents as practical a solution of the difficulty as is likely to be found. In our best managed factories the milk is generally all good. The reason is that the manager exercises a wise influence over the producers.

If milk is brought that is not up to the mark, the fault is pointed out, and advice given how to remedy it. Should the cause be of such a nature as to render it easily overcome, no excuse is taken after the first warning, and the delivery of such milk is promptly refused. If the remedy is difficult to apply, more latitude is given, advice and help are tendered, and the same firmness is displayed in dealing with the supplier. It is in such firm supervision of the milk supply where most of our factories score and succeed. It is in the want of such safeguard, and, necessarily, sure foundation, that so many fail to make good butter. A good builder makes a secure foundation before he erects a structure that he wishes to last long and reflect credit on him. So a good manager or butter-maker has to take similar precautions. Managers should have full control in all matters pertaining to the quality of the butter. The exercise of such authority always demands the greatest tact. It would be an easy matter to make one's methods of dealing objectionable, and drive the suppliers away. Great changes for the better should be brought about gradually in a factory.

Suppliers should recognise that their factory manager has to daily act as an arbitrator in matters relating to their welfare. First of all there is the relationship between the shareholders of the company and the milk suppliers to be borne in mind. Then there is fair play to be meted out between one supplier and another. And the manager has to protect his reputation by turning out a good article. It is a delicate position to fill well. In a few instances where full control is given the necessary backbone is wanting, proper authority is not exercised, and the energies of the manager are sometimes misdirected, undue attention being paid to certain branches of his work.

The manager, in some cases, is always to be found behind the butter-worker, concentrating his main efforts to the make, the build, the texture, and finish of his butter. Such points are all necessary, and should receive their due share of attention. But what is the good of a butter perfectly made and got up if it is wanting in bouquet and flavour?

Flavour is the great essential in good butter. All the other points - texture, salting, packing, colour, &c.—embrace the condition of the butter, and can be easily controlled and regulated. The great desideratum is flavour. It is the fineness of flavour that makes butter sell at a shilling a pound, and it is the want of it that causes an equally good butter in other respects to bring only eightpence in the same market. Any manager, therefore, who does not make the flavour his chief study and object is not working in the best direction.

The greatest success attends those who make the condition in which the raw material, the milk or cream, reaches their hands their first care. It does not follow that they must always be present when the milk is being received. Instructions to those who take the milk should be definite and pointed, and in large places an occasional visit to see that it is done properly is generally sufficient. Suppliers should not think that any hardships are proposed to be laid upon them. The proportion of careless suppliers that really require looking after is small, and it is not fair that for the faults of those few the quality of the produce belonging to the great majority should be lowered.

We have attained uniformity in individual factories, but in many the standard is too low, owing principally to want of strictness in looking after the milk supply. Without a standard of excellence in his mind the butter-maker cannot tell what he is aiming for. Each has an idea of what a perfect butter should be, the same as everyone has a different standard for cleanliness. What one considers perfect another often thinks far from perfect.

A butter-maker who aims at making the kind of butter that the customers like the best, and are prepared to pay most money for, cannot go far wrong. Never mind catering for individual fancy, not even your own. If your butter is to be consumed in Melbourne, make it to suit Melbourne customers. If for West Australia or Cape Colony, make and pre-

pare it in the manner and shape preferred there; and if for London, try and study the best means of manufacture that will cause it to give best satisfaction there. The hard matter in connection with this is to secure reliable reports as to how the butter suits the consumers.

The account sales serve as the best indicator; but very often a 112s. report accompanies a 105s. price. It is considered business to take steps to secure the continuance of butter through one's hands, no matter what the quality of it is. The opinion of the consumer, if not flattering, must therefore be withheld, or trimmed into such shape so as not to run the risk of losing that brand another season. Producers are often naturally suspicious that a report drawing attention to faults is framed to justify low prices.

This is a delicate and important point, that may eventually call for a more satisfactory method of dealing with that would be more agreeable and satisfactory to all parties.

Too many of our butter-makers miss this great point altogether. They strive to make an article that pleases themselves —an article which, at the time of manufacture, is good and nice.

They do not follow it up, and try to find out how it stood the journey to the consumer, and what effect the variations in temperature had on it. Rarely do they closely inquire as to how it stood the tests of the buyers, and suited the consumers.

From this it will be seen what an important part the care of the milk takes in making good butter. It is little use to expect to make choicest butter from milk any proportion of which is not good. However the question has to be faced as it is, not as it ought to be. In many localities it is more than a man's position is worth to refuse milk and cream not first class.

The following extract from a factory manager's letter will serve to illustrate how matters stand :—

"I am not at all surprised to hear you complain about our output being bad in flavour. I am far from satisfied with the general quality of our export make ; but I can assure you that I have done my level best with the material I am obliged to handle.

"Eighty per cent. of our business is hand or turbine separator trade, and during the summer months I find it is impossible to make anything like a first-class article.

"Some of the suppliers are far from being clean, whilst others keep the cream too long on hand, and give it no attention. A few of my suppliers are very careful people, whose cream always reaches me in the best of condition, but the majority are hard to do business with.

"The small separators are rapidly increasing, and are accountable for so much bad cream. They have come to stay in some districts, so I think it is time something was done to protect the export trade. I cannot remedy the evil at the factory, neither do I think any man can do so. The cream is gone too far for that ere it reaches us. I have been amongst my suppliers, giving them any useful hints I knew of

"The results were an improvement for a few days, but they soon fell back to their old groove again. If I reject their cream someone else will take it, so I have to try and hold all kinds, good, bad, and indifferent. I think the Government should take some steps, and enforce stringent measures to rectify the matter.

"I regret to say that most of the suppliers are indifferent, and do not care what harm they do, so long as they get rid of the cream

"Eventually (if not protected) I am afraid the whole industry will suffer through this means. It is no use in waiting for anyone else to make a move, and I do not think any other person's protest will carry so much weight as yours. I stand on delicate ground, and dare not take up the cudgels against my own suppliers, and so I am in hopes you will take some measures to cope with this evil before our next export season commences."

We are sorry to say that the above letter presents an exact statement of the position of affairs in a few cases. It is not general as yet, but is growing, and has a strong tendency to spread. To put it plainly, much harm has already been done to our export trade through the breaking down of the original co-operative system in some localities. A little further on and it will mean the forfeiture

of our position in the world's markets, and not unlikely the wrecking of our export trade. To those not in the business a short explanation may not be out of place. The original splendid co-operative system was started on the following sound lines :—Factories and creameries were established where the milk was delivered by the farmers The lots of cream were large enough then to warrant proper attention and prompt delivery to the factory, and the making of a uniform quality of butter of a high standard.

With our high-class butter of uniform quality we got a footing on the London market, and year by year gradually improved our position. Of recent years there has been a growing disposition on the part of dairymen to purchase small plants and separate their own milk ; the individual supply of cream is, consequently, so small that it is not worth special attention, and as the cream is only sent to the factory when convenient—three times a week, and often only once a week—it can be imagined that in our hot climate it frequently reaches the factory in an unsatisfactory condition. The foundation of our past success—uniformity is thus being destroyed. The average quality is lowered in standard, and the cost of production and marketing increased. It is difficult to understand why dairymen are doing this with their eyes open. The danger is pointed out to them on every possible occasion. Of course there is no alternative open to those who are not within reach of a creamery or factory, and they cannot be blamed. If the factory were to send round collectors daily it would add to the cost of production considerably, and it would also be undesirable to have inspectors who would insist upon all cream being properly handled and cared for. Neither would it do, when butter from such cream is not best quality, to refuse its shipment, so the simplest way out of the difficulty would be to discard the system and dispose of the small machines to our opponents in other countries.

It is to be hoped that sufficient has been said to impress upon dairy farmers and dairy students the important part that the dairyman takes in the production of good butter. Having recognised that point we can now proceed to discuss the part allotted to the butter-maker.

Skimming.

A temperature of 80 deg. Fahr. is laid down as the most suitable temperature for skimming. At that temperature the cream is taken off cleaner and more readily than at a lower one. Good work can be done at a much lower temperature than 80 deg., but to do so the milk must be passed through the machine more slowly. There is a danger of the cream clogging when skimming at a low temperature. It is often necessary to skim at as low as 65 deg. in the summer months where there is insufficient refrigerating power available. It has been maintained that, if the temperature of the cream is over 80 deg. when skimming, the butter would be greasy. The texture of the butter is not, however, affected if the skimming be done at 160 deg. The higher the temperature of the milk the more perfect the skimming, and the greater the quantity that may be passed through the separator with as good results.

The same thing holds good in regard to the speed of separators. The higher the rate of speed the better the separation, and more can be passed through with good results. The lower the speed the more imperfect the skimming, or to a certain point as good, but less work can be done. Separators should on no account be run much beyond their stated speed.

The essential points in good skimming are even temperature, even speed, and even feed.

Separators should be checked daily in their work. If samples be taken in a factory where a number of machines are working—all of the same make and estimated capacity, all being fed through the one pipe with milk of the same temperature, all driven by the same shaft, and going at the same rate of speed—and tested, it will be found that the results vary. In the skim-milk from No. 1 we will probably find 0·2 per cent. of butter fat ; in that from No. 2, 0·025 ; from No. 3, 0·1 ; No. 4, 0·14 ; No. 5, 0·05, and so on.

This will not be found in a factory where the result is constantly tested and the machines properly adjusted. Machines are liable to go out of best form from time to time. In early separating days an average loss of under 0.15 per cent. of fat in the skimming was considered good,

whilst at the present time any average loss of over 0.05 is considered bad skimming. Thus 0·1 per cent. of loss in a company's average turnover of 2,000 gallons a day means in twelve months about 8,322 lbs. of butter not recovered. It will thus be seen that it pays to keep a sharp watch over the separators.

Treatment of Cream.

After the cream comes from the separator it should be cooled. The exact degree of cooling depends on the ripeness of the milk when skimming, the state of the weather, and when it is intended to be churned. When the milk has been separated in good condition, 65 deg. would be cool enough temperature for the cream, as the cream will ripen more rapidly than at a lower temperature. If the milk was ripe at the time of separating, the cream should be cooled to 60 deg , or according to the degree of ripeness. Should the weather be warm and close the lower the cream will have to be reduced in temperature to retard ripening, and if the day is cold the higher the cream may be left in temperature to hasten the ripening. When the churning is to be done on the day following separating, the more rapid must the ripening be made, and slower when the cream is left till two days old. The cream can be hastened in ripening by the addition of a starter, such as good buttermilk, or a culture prepared in skim or new milk. (Cultures are dealt with elsewhere under the head of "Pasteurising.") Churning has to be done as soon as practicable after separating, but not before a certain degree of lactic acidity has been developed.

In many factories it is practicable to churn on the day following separating, whilst in many others it is not convenient to do so till two days afterwards. In all well regulated places there is a time-table arranged and followed as closely as possible.

The cream is prepared so as to be right for churning when churning hour arrives. Authorities differ widely as to how cream should be treated from the time of separating till the time of churning. Managers have been met with who, after separating, cooled the cream down to 64 deg., and gradually to 58 deg., and churned it on the following morning. By this treatment butter was made that brought highest prices for each consignment right through the season in England. Again, another factory manager cooled the cream to 67 deg. or 68 deg., left it at that temperature for 24 hours, then cooling to 54 deg., and after another 24 hours, churning and making a butter that brought equally high prices. Both systems had been adopted as the result of many years' close practical study of the business. The goal is secured in different places by sometimes widely differing routes, and it would be invidious to say that either way was wrong.

At many places sufficient refrigerating power is not available to enable the manager to control the temperature as he would wish. It is when placed in such a position that the resourceful man comes out on top. A great deal can be done in some places without a refrigerator.

If plenty of cold water is at hand the cans of cream may be put into the water. After a time the water becomes warm with the heat abstracted from the cream and should then be replaced. Mistakes are often made by leaving the cans in the water when the atmosphere is colder.

Placing wet bags round the cans when neither cold air or water is procurable is a good plan.

At any place where much butter is made the aid of a refrigerator is imperative in the summer months. A man's surroundings or environments will always suggest methods of treatment for the cream.

(To be continued.)

The western ranchmen (writes the *Farmers Review*, Chicago), have found a new outlet for otherwise worthless horse-flesh. The ranges of western Montana have for a long time supported large droves of wild horses of no particular breeding, and worthless for commercial purposes. Their hides could be sold for about 2 dols., and the ranchmen sometimes bought the animals from the Indians at a nominal price. Recently a ranchman that was feeding a large number of hogs concluded to try horse-flesh. So he started in buying at 1 dol. 75 cents all that the Indians would bring him. He sold the hides for 2 dols. each, and fed the horse-flesh to his swine. At last reports he had disposed of about 500 horses in this way. As the horse-flesh costs him practically nothing, it should be a paying business.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 15th May next :—

Howick.—Dark-coloured donkey (old), supposed to have been left behind from a troop going down country.

Dundee.—Black-and-white-cow, slit in left ear, branded indistinct, looks like G. Red cow, branded right ride A.L. Red-and-white bull calf. Bay mare, two white hind feet, white spot on nose, no brands. Small bay mare, two white hind feet, white spot on forehead, and white stripe on nose ; hog mane and cut tail. The above cows and calf have passed through lungsickness.

Nqutu.—Chestnut mare, star on forehead, long switch tail, no brand, age three years, height 14.1.

Mossdale.—Eight Angora goats, in good condition, different ear marks.

Mooi River.—On the farm "Craignenar," of Mr. Geo. Gibson · Light bay colt, long tail, white spots on hind quarters, about two years old, no brands or marks visible.

Acton Homes.—On the farm "Droog Kop," Mrs. J. Bester : Black ox, short tail, little white under belly, branded on the left leg H.W., on right shoulder half moon.

Weenen.—Grey kafir goat (ram), no marks. Black-and-tan kafir goat (capater), slit in left ear. Black-and-tan kafir goat (ewe), slit in right ear.

Ndwedwe.—Light brown mare mule, sore withers, branded on near fore hoof 48097, and on off fore hoof broad arrow.

Boston.—Black bull, both ears marked, no visible brand.

Sugar Cane Disease.

A RECENT number of the *Bulletin* (No. 7) of the Land Records and Agricultural Department of India contains an account of the sugar-cane disease, variously known in India as *rind fungus*, *red patch*, and *red smut*. Of the varieties of sugar-cane grown in the North-West Province the one known as *Katara* cane is the only kind which has so far been affected. This cane is a valuable variety, possessing much juice, and having a soft pith and broad leaves. It is more commonly cultivated for chewing than for producing sugar.

The fungus, which is known botanically as *Tricosphæria sacchari*, appears to be a somewhat recent importation, since no mention of it in the districts affected can be found of earlier date than 1875. In 1877 the fungus caused much loss in the district of Meerut, and in the same year it appeared for the first time in the Pilibhit district, and since then it has occurred yearly in a more or less severe form.

During the last ten or twelve years the havoc wrought by it in Meerut, Rohilkhand, and Gorakhpur has been so great that the cultivation of *Karata* cane has been gradually abandoned in favour of less valuable, but also less susceptible, varieties.

The disease generally makes its appearance towards the end of the rainy season in September, and always *before* the adult stage of the canes has been reached ; thus, if a crop escapes until January it may be regarded as safe. The first noticeable symptom of the attack is a change of colour in the leaves, from dark to light green. The stem next acquires a dingy yellow colour, and finally the pith begins to show

red dots, gradually increasing in size. At the same time the juice acquires a disagreeable taste and unpleasant odour, and, finally disappears altogether, the pith, at this stage, also breaking up into a black powder.

The whole cane is rarely destroyed in this manner, the disease merely affecting a few of the internodes. The propagation of the disease seems to be favoured by dryness of the soil, and poorness of the crops.

No method of preventing the spread of the fungus has yet been found, and the native cultivator, as a rule, simply begins cultivating a fresh variety of cane when his crops have been attacked by it. As a rule, also, he does not destroy an affected crop, but leaves it to rot in the ground, and this practice is doubtless the reason of the long continuance of disease in the district. Specimens of affected cane from Pipra, a village in Gorakhpur, have been sent by Mr. Hadi, Assistant Director of the Department of Land Records and Agriculture in the North-Western Provinces, to the Director of the Botanical Department of Northern India for identification of the fungus, and for suggestions as to best method of stamping it out. The fungus has been identified by the Botanical Department as *Tricosphœria sacchari*, but the only remedy suggested is that every affected crop should be burnt, so that the spores of the fungus may not be disseminated among the healthy canes.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write :—It is a long time since the Colony has experienced such a remarkable rainfall for March and April ; and as a result produce of every description is plentiful, and in many lines cheap. Mealies still show an inclination to fall in price ; and from nearly all parts of the Colony there comes the pleasing information that there will be a good crop.

Mealies.—The highest price on the market has been 10s. per muid, including sack ; but some samples were down to 8s. and 8s. 6d. per muid.

Forage.—Small lots coming forward, and prices have fluctuated between 11s. and 12s. 6d. per 100lbs.

Hay.—Some first-class samples are being offered daily, at prices varying between 1s. 2d. and 3s. per 100lbs ; and bedding has realised from 5s. 6d. to 20s. per load.

Potatoes. Larger quantities are now coming forward. Early Rose, 7s. 3d. to 16s. per 100lbs. ; Up-to-Date, 10s. 9d. to 13s. 6d. per 100lbs. ; Rough Reds from 8s. to 10s. 9d. per 100lbs ; Beauty of Hebron, from 8s. 9d. to 13s. 6d. per 100lbs ; and Sweet Potatoes from 1s. 9d to 6s. 9d. per sack.

Mabele.—From 8s. 6d. to 12s. 9d. per 100lbs.

Buckwheat.—From 13s. 9d. to 14s. per 100lbs.

Onions.—This vegetable, although more plentiful, still commands high prices, and while some samples have been as low as 8s. 6d. and 11s. per 100lbs, others have been up to 26s., 29s. 3d., 31s., 34s. per 100lbs.

Pumpkins.—From 3s. to 13s. 3d. per dozen.

Tobacco.—Several lots have been disposed of at prices from 7d. to 1s. 1d. per lb.

Butter.—Several samples have been down to 10d. and 1s. per lb , others have been disposed of at 2s. 1d., 2s. 3d., and 2s. 6d. per lb.

Eggs.—From 1s. 10d. to 4s. 3d , 4s. 10d., and 5s. 7d. per dozen.

Poultry.—Fowls, from 2s. to 7s. 6d. each ; ducks, from 5s. 3d. to 9s. 6d. per pair ; turkeys (hens), 6s. 3d. each.

Sundries.—Bacon, from 2d. to 8½d. per lb. ; ham, from 5d. to 11½d. per lb. ; beef, from 4d. to 7d. per lb. ; mutton, from 3d. to 9½d. per lb. ; pork, from 4d. to 9d. per lb. ; tea, 1s. per lb. ; and several lots of fish have also been sold.

Fruit.—Apples, bananas, grenadillas, lemons, mangoes, pears, oranges, and pineapples constitute the varieties sold.

Vegetables —Beans, beetroot, bringals, cauliflowers, cabbage, carrots, cucumbers, green mealies, onions, potatoes, rhubarb, tomatoes, and turnips have been sold every day.

Wood.—Market has been well supplied during the last fortnight, and prices have varied between 4½d. and 10d. per 100 lbs.

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AND MINING RECORD.

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CONTENTS.

Horse-sickness Investigations.

BY H. WATKINS-PITCHFORD, F.R.C.V.S.

(*Continued.*)

A BRIEF review of the theories and ideas as to the aœtiology, or cause, of South African horse-sickness will appropriately accompany a description of the lines of investigation suggested by such review.

The possible modes of infection are three in number which may be termed :—

(*a*) *Subcutaneous*, or Traumatic (*i.e.*, through abrasions of surface). This heading includes the agency of insects who puncture the skin for the purpose of abstracting blood, or otherwise.

(*b*) *Respiratory*, infecting through the air passages, when in a normal or possibly an abnormal condition.

(*c*) *Ingestive*, where infection takes, place through normal or abnormal condition of mucous-membrane or digestive apparatus, and under this head would naturally fall the agency of intestinal parasites. I have included also under this heading (*c*) the possibility of infection through the lachrymal mucous-membrane of the eye

The above possible modes of infection will, I think, be found to cover all the methods by which the organism can gain access to the system of a horse, and we must endeavour to ascertain by which of these channels a horse becomes naturally infected.

We cannot, however, take it for granted that one and one only of the above modes of infection are concerned in the spread of the disease.

These theories as to the production of the disease are, of course, based upon the assumption that South African horse-

sickness is microbic in nature, or due to the agency of a micro-organism which has hitherto eluded discovery. This conclusion seems warranted when we consider the well defined period of incubation, sudden accession of urgent symptoms, and the certainty of infection by means of the injection of a minute dose of virulent matter.

The fact that we are not able to demonstrate the organism does not negative the possibility of the agency of such in the production of the disease for we have several parallels in bacteriology such as rabies, small-pox, etc., etc., in which we are equally unsuccessful in our search for a causal microbe. Possibly improved optical apparatus may bring these minute bacteria within our sense of sight, but it is more probable, seeing the great efficiency to which lenses are brought in modern years, that we shall have to fall back upon corrobatory evidence by the existence of a specific organism such as may be furnished in the investigation of this disease.

(*a*) *Subcutaneous or traumatic theory.*—The arguments in favour of this mode of infection are numerous and weighty, pointing to the agency of insects rather than to simple traumatisms or wounds being the points of ingress of the disease. These later must be very varying both as to place and manner, and the fact exists that no connection has been traced between cases of severe traumatism or wound and instances of the disease (such as obtains in the disease Tetanus).

The only argument tending to confirm the simple traumatic theory seems to be the prevalence of cases as reported by some observers immediately after the early frosts and before the weather has become so cold at night as to be inhibitive to bacterial life. In this case it has been suggested that the act of feeding on frosted pasture being followed by an increase in the number of cases might indicate that the cause usually lay in some laceration of the tongue or lips and the introduction of the disease consequently through these channels of the mouth and tongue, and the incidence of cases about this time might be held to be related to such a cause, and indicate a possible clue to the manner of general infection.

The fact that animals receiving cut and carefully gathered food, in whom no such lesions presumably exist, suffer from the disease, and also that the disease attains its maximum violence at periods free from frost, would tend to discount such a theory. Such a cause in any case could only be operable in a very small percentage of cases of the disease, and its significance is accordingly not great.

The Insect Theory.—If the agency of insects as disease-carriers is admitted, no fact which has occurred to me in considering horse-sickness exists to exclude the possibility of the principle being applied in this disease. Presumptive evidence—where all theories are at present presumptive or tentative—points to the possibility of such an agency in the case of the malady in question.

The points tending to confirm such an hypothesis are many, and parallels are not wanting in the case of such diseases as the malarial fevers of man, filiariasis of the blood of man, both due to the well proved agency of the mosquito. Yellow fever, proved recently to be due to infection by the mosquito, elephantiasis, malaria of sparrows, bats, etc. (furnishing an instance of the infection of the lower animals by the mosquito) the pyrosomal disease (red-water) due to the tick, and Ngana or Tsetse-fly disease, and the various instances brought forward from time to time of the spread of disorders by the puncture of fleas, bugs, all instancing the power of insects to produce disease in and transfer the disease from man to man, some probably only mechanically as intermediary bearers without alteration of life cycle, and others as definitive hosts in which the specific organism undergoes a phase of development in the body of the insect before it is capable of becoming infectious to man.

In consideration of this heading the weight of evidence in the production of horse-sickness seems to be in favour of inoculation by the puncture of some insect whose habits closely conform to those of the culicidœ or mosquito family. Arguments in favour of this theory are reconcilable with the existing ideas, experiences, and folklore of those having a practical experience of the disease for many years.

The *Dew* has long been considered to possess some influence in the causation of this disease. Exposure of animals during the hours of dew precipitation is generally looked upon as a dangerous proceeding during the sickly season. We are told to avoid exposure of the animal "while the dew is on the ground." The exclusion of dew by closing all doors and nailing sacking over the windows has often been adopted with success. Troughs and drinking vessels have been covered with a similar object. The above precautions are held by many to be unnecessary during rainy weather, when, of course, no dew is precipitated. Heavy falls of dew are particularly to be avoided. A hazy misty morning of early autumn at the close of the rainy season with low-lying mists or fogs is reputed as dangerous until such appearances have been dissipated by the sun.

Such popular ideas as above, connected with the dew and the dew fall, have a significance when it is remembered that the period of greatest activity of the mosquito family is about an hour before sundown, and two hours after and two hours before daybreak, and an hour after sunrise. These periods, therefore, are closely corresponding with the hours of dew precipitation. This idea is somewhat strengthened when one finds some meteorological authorities asserting the existence of two chief precipitations of dew during the twenty-four hours (termed by the French meteorologists the *rosein* and the *serrein*) these two precipitations taking place about sunrise and sunset, and, therefore, corresponding closely with the ascertained periods of greatest activity of the mosquito.

Remembering this fact it was with interest that I heard the testimony of an old Natal Colonist, who narrated to me an experience he had met with when travelling in the Transvaal many years ago. Happening about sundown to find himself belated, he turned aside for the night to a Dutch homestead, but, it being the height of the sickly season, he was somewhat concerned at the prospect of leaving his horse, a valuable one, in strange quarters. On expressing this fear to his host he was told that he need have no fear if he tied his horse up in a shed for an hour or two after sundown, and then knee-haltered it and allow it to graze, being careful to tie it up again well before the sun rose, and so to keep it tied up, if necessary, until the sun was fairly up. This plan, the narrator was told, had been followed for years with unvarying success by his host, who had thus enjoyed an immunity in which his neighbours had not participated.

While there may be considerable truth in the experience, it would occur to people that mosquitos are often troublesome throughout the whole night, but it must be remembered that different species conform to different habits of life and hours of activity, and that as many species of mosquitos undoubtedly exist in South Africa we are not justified in discounting entirely such evidences, neither can we be dogmatic upon a subject about which our knowledge is at present to a great degree mere speculation and conjecture.

Such experiences, if those possessing them will take the trouble to record them, may become of considerable value in the difficult work of the investigation of this disease, and I again cordially invite the ideas and theories of those readers of the *Agricultural Journal* whose experience leads them to the formation of an opinion in any direction.

The closing of stable doors and windows would be as effective in excluding winged insects as dew. The covering of water-troughs would possibly prevent the vicinity being infested greatly by mosquitos. That these insects do not fly during rain and are numerous towards the autumn after the rains, is a matter of everyday observation, while dampness of grass and humidity of atmosphere seem conditions directly favouring mosquito activity. Thus it is seen that the dew against which we have so sedulously guarded may possibly yet prove the truth of its harmless and poetic character, and be blameable only in so far as it permits nocturnal insects to be its constant companions and close associates.

(*To be continued*).

The enormous yields of milk from certain breeds of cows in the showyards are often quoted, but usually nothing is said as to the quantity and quality of the food consumed. A dairy cow is practically a machine for converting the food she consumes into milk. The *American Agriculturist* states that the Holstein cow, Rosa Bonheur 5th, which held the world's record, having produced 106.75lbs. of milk in one day and 726.25lbs. in a week, ate daily 114lbs. silage, 12lbs. cornmeal, 9lbs. oatmeal, 3lbs. bran, 9lbs. oilmeal, and 27lbs. of roots.

Xanthium Strumarium, Linn.

By J. Medley Wood, A.L.S.

IN the year 1883 I brought to the notice of the Government the fact that this imported weed was on the increase in the Colony, both on the coast and in the midlands, and suggested that measures should be taken for its extermination, as from information which I had received from Australia and which I forwarded to Government, the plant was said to be injurious to cattle, and I also suggested that it should be included in the same Law as *Xanth um spinosum*, *Linn* In consequence of this, notices were issued to the country Magistrates and road overseers, with photographs of the plant, and instructions for its destruction by roadsides and other places, but it was not included in the Law. Some persons reported that it was not an imported plant, but a native of the Colony, that they had known it for many years, and that it was not injurious to cattle, and one person stated that his neighbour had fed his pigs on it, that they did not care much for it but did eat it, and it apparently did them no harm ; also, that cattle will not eat it at any time. I believe, and I said at the time, that this arose from the fact that a species of *Triumfetta*, which was plentiful in the neighbourhood, had been mistaken for the *Xanthium*. Some little attempt was made to get rid of the plant, but these attempts soon ceased, and I notice now that in many places it is rampant. As to its poisonous properties, which have been disputed, I notice in a late number of the "Pharmaceutical Journal" that a paper was read, from which I give a few extracts. This paper is by Mr. J. S. Ward.

"I propose to bring under your notice, first a substitution, afterwards an adulteration, of stramonium. The substitute was offered from two different sources, with samples, as cultivated stramonium ; they proved identical in every respect. To anyone conversant with stramonium the substitution was obvious. At that time very little stramonium was obtainable, consequently high prices ruled. The collection of medicinal plants in localities where they grow wild is carried on as a rule by persons who are devoid of botanical knowledge. When the plant they search for is scarce, that which has some common characteristic is chosen. This is a case in point. The leaves might not agree in shape and in structure, yet the fruit has something to an uneducated eye in common. Hence probably the cause of this substitution. . . . . The adulterated stramonium was sent to this country to an importer last year. Luckily the admixture was immediately noticed, and the whole parcel returned to the sender."

The chief adulterant in this case appeared to be *Carthamus helenoides*, but leaves were also found of *Xanthium strumarium*, and of this plant the writer says :—

"In America and Australia this plant has been observed to prove fatal to cattle and pigs which have been pastured upon it. It is used in some parts of Germany, and has a popular reputation as a remedy for ague. In Russia it is considered to be a prophylactic in hydrophobia. In the Punjaub and Scinde it is given in smallpox, and in many Asiatic countries it is regarded as being efficacious in various diseases, especially in malarial fever. M. V. Cheatham (Amer. Jour. Pharm., 1884) made some experiments with the fruits with the object of isolating the active principle. He does not appear to have isolated it, but after treating a resinous extract with acidulated water, the residue produced no effect on a small dog, given in 4 gramme doses."

In the discussion which ensued after the reading of the paper, Mr. E. M. Holmes, F.L.S., secretary of the Pharmaceutical Society, and a well-known botanist said :-

"Some years ago a paper was published by the late Dr. Bancroft, of Brisbane, on the poisonous properties of *Xanthium strumarium*. If my memory rightly serves me, the poisonous character of the plant was determined by experiments made with an extract, and the poisonous action on live stock could therefore not

have been wholly due to the prickly character of the fruits."

In my Annual Report for 1886, I referred to this plant and suggested that it be included in the *Xanthium spinosum* Law, and I am now pleased to see that it is proposed to do so. It should be stated that its burrs are almost if not quite as injurious to wool as those of *X. spinosum*.

The March Rains.

THE meteorological returns show that during March there was an almost general heavy fall of rain.

Gorton, Ixopo, continues to suffer from prolonged drought. Mr. Charles Green writes :—"There is rain all round, but none in the thorns. Mealies will be scarce therein—none in fact; the inhabitants will have to purchase. The Ixopo has not been so low for the last fifty years. Some sluits about here have ceased running. Natives have to drive cattle a long way in many cases for water, and the inhabitants have to fetch their domestic supply from a distance."

It will be noticed that while there are returns showing over ten inches for the month, at Gorton only 1·55 in. fell.

Accompanying his rainfall return, Mr. A. Wilkinson, Ottawa, sends the following notes :—"This month is remarkable for number of days' rain from the N.E., which is unusual. A very good month's rain, not too much rain at a time to run to waste in the rivers. We may expect rain until the middle of the month, two days before the change of the moon. As a general thing on the Coast the mercury falls about two days before full and change of moon, and the wind changes to S.W., the rainy wind, but does not always bring rain. Mr. Glaisher, the celebrated meteorologist, says the moon has no effect on the weather, but I have found it not to be the case in Natal, as any old sailor can tell you. A. W., one of them."

Clairmont. Mr. J. R. Blamey writes:—"We have not had a month's rainfall like this since March, 1897, when we had 12·47. On the 16th there was a downpour of 4·10 in."

Nottingham Road, Lynedoch. Mr. Charles King writes :—"The rainfall for March, 1900, was 4·46 in." On five days over one inch fell.

Ematoma. The following remarks accompany this report :—"The rain throughout this month has been very good for root crops, such as turnips, etc., but would like to see a little more sunshine to ripen up cereal crops. Sheep have not done so well this month, blue tongue being very prevalent amongst them."

Grass Seeds for Distribution.

THE Hon. F. R. Moor has presented to the Agricultural Department for distribution 14 lbs. of Medicago obicularis, commonly known as burrless medick grass, and one bushel of prairie grass (Bromus uniloides).

The first—Medicago obicularis—is of Mediterranean origin, and has been widely distributed through Australia by Baron von Mueller. The stems are diffuse and the plant is many seeded. When pasturage fails sheep lick up the seeds. One plant bears as many as 1,400 seeds. It is much esteemed as a pasturage plant in Australia.

The second — Prairie grass — is also much esteemed in Australia. Messrs. Anderson & Co., seedsmen, Sydney, N.S.W., describe this grass thus :—"A very early spring grass, growing very rapidly at this season, and continues to yield a fair amount of herbage through the summer and autumn in favourable seasons. It seeds very freely, and soon

spreads by self sowing. A nutritious fodder and pasture grass; one of the most valuable we possess. In rich land it will produce very heavy crops of the richest character, and will afford five or six cuttings in the year. As a pasture grass it is first-class, being even richer in nutritious properties that the much-valued perennial rye grass. It will give the best results on rich, moist land, but will do fairly on any soil, and should form part of all pasture mixtures. Two to three bushels will sow an acre." Further reference to this grass will be found under the heading of correspondence."

Applications for seed should be directed to the Commissioner of Agriculture.

Paspalum Dilatatum.

THE following, extracted from a personal letter to the Editor by Mr. Medley Wood, A.L.S., will be read with interest:—"I have just returned from a visit to Newcastle, and have brought with me a good lot of roots of 'Paspalum Dilatatum,' which have been planted and will be well looked after. I find that this grass in that place is not uncommon, but is always found in watercourses or on the edge of them. This may be due to the fact that the seeds, after heavy rains, are washed down by the rush of water, or that—if, as it is said, the seed is somewhat difficult of germination—the damp soil by the edges of the little streams is more favourable for this purpose than the dried ground away from the watercourses. I have also a little seed which I shall try in the spring when the rains come. I find also that this grass is more plentiful about the village than I had thought."

District Reports.

NKANDHLA District, 11th April.—The fall of rain during March was very heavy, with incessant thick mists almost daily, which has been very bad for the health in the District. Bad colds and bronchitis have been prevalent, as well as three cases of enteric fever amongst the Europeans. The crops are beginning to ripen, and there promises to be a good harvest. No locusts have been reported in the District. One horse, the property of Mr. Hyslop, died on the 8th instant from bots, otherwise all stock is looking well, and no diseases have been reported.

C. C. Foxon, Magistrate.

STANGER, 16th April.—The weather has been exceptionally mild and pleasant lately, copious showers of rain having fallen at intervals. The mealie and mabele crop promises to be a record one. Planters are now busy reaping, and in one case, that of Messrs. E——— & Son, the yield of mabele, off a field of 120 acres, is expected to exceed 19 muids to the acre. This crop, I am informed, has been snatched up by a Port Elizabeth firm at 20s. per muid, delivered at the nearest railway station. Although this is an exceptionally heavy return, still it may be taken as an indication of the condition of the crops generally in this Division. Sugarcane has now entirely recovered from the drought in the early part of the season, and it is anticipated that the crop will be a full one. If the natives on the North Coast were more industrious, there is no reason why they should not be an independent and wealthy community. But it is almost impossible to buy a bag of mabele from a native, as they seem to have gauged to a nicety the minimum of cultivation necessary to carry them through the year. Locusts do not touch mabele, and therefore there is no excuse for not putting in more. There is no restriction as to acreage in the majority of cases, yet only sufficient for bare necessities is planted. Instead of cultivating sufficient to be able to meet their rents out of the return, native tenants are content to go on in the same old style, and when their rents fall due, it means a Court case, in many instances doubling the original amount in actual fees, before a final settlement is made. In many cases the unfortunate landlord loses out of pocket expenses as well as the rent, as the tenant has nothing, will not cultivate, nor work. The end is ejectment, and the defendant moves on to another farm, where the same process is gone through.

A. J. S. Maritz,
Acting Magistrate.

PORT SHEPSTONE, 20th April. — Since writing my last report we have had two cases of

either horsesickness, blue-tongue, or dikkop. I mention the three diseases because one person calls it the ordinary horsesickness, another blue-tongue, and a third dikkop I think it would be as well if the Principal Veterinary Surgeon could give us the different symptoms of these three diseases, because it appears to me that there are some who are in a complete fog in the matter. While on this subject I would like to mention that some experienced farmers up-country informed me that when blue-tongue made its appearance amongst the sheep it was a sure sign that horsesickness had commenced too. It would be interesting to know, therefore, if there is any connection between the two diseases, and if they have a common origin or are due to the same cause. A native came in yesterday to report that nine head of cattle had died at the Ntimbankulu of a disease unknown to him. Some of his neighbours were of opinion that it resembled rinderpest. Two other head are still sick. I at once wired to the Principal Veterinary Surgeon to send one of his assistants, so that in a few days we shall know what it really is. Let us hope it is not rinderpest. The rainfall, for the month, to date, has been 1·92 inches, and the highest maximum temperature 80 degrees, on the 2nd inst.

P. Hugo, Magistrate.

Trout Fishing in Natal.

By SYDNEY W. GILBERT.

IT will doubtless come as a pleasant surprise to a number of anglers in this country that trout fishing is now an accomplished fact, and that under favourable conditions good baskets of this game and succulent fish can be obtained on the upper waters of the Umgeni and Bushman's Rivers. This happy result is due to the practical and energetic efforts of Messrs. Cecil Yonge, Hutchinson, and John C. Parker, etc. To Mr. Parker a special meed of praise is due. From the inception of the idea to introduce and propagate trout in the rivers of Natal down to the present date - covering a period of some seven or eight years—he has spent time and money and brought practical experience to bear in the furtherance of this laudable object, and I have not the slightest hesitation in saying that the final success of the undertaking is mainly due to him.

For some time it has been known to a few enthusiastic anglers that the upper waters of the Umgeni offered good prospects of sport, and a fishing trip organised by Messrs. George, Fynney, Watson, Shepstone, and Gilbert in the early part of this year was so successful in face of unfavourable conditions, both as regards weather and low state of water, that a suggestion for another and longer trip at Easter met with an enthusiastic response, and in connection with this it has occurred to me that it might interest your readers and sportsmen generally to have a few particulars of the sport enjoyed and experience gained.

Arriving on the camping ground after several vicissitudes, including the upsetting of the wagon, it was not long till camp was pitched. Rods were put together, and each man left for some favourite pool on the river. From the very beginning it was evident that the sport would be excellent. As the speckled beauties were grassed one after the other, everyone was glad to observe the greatly improved condition of the fish, and the water was also in excellent trim, thanks to the copious rainfall of the previous few weeks. On one or two afternoons in particular grand sport was obtained, and a basket of fish brought to camp by Mr. Oswald Fynney on one of these favourable occasions would have delighted the heart of even the most surfeited angler in the Old Country ; the catch totalled seventeen fish, weighing 15 lbs., all in splendid condition. This proved the largest individual take of the trip. The final bag of 160 for five rods, over a period of five days, was exceedingly gratifying to those who had the good fortune to participate in the sport.

The Umgeni is a typical trout river, and the fish take the fly as freely and give as good sport as they do at Home ; altered conditions as to climate, etc., do not appear to have changed them in any way, except in the matter of spawning. They do not yet appear to be quite settled as to the proper season to increase and multiply, as fish have been found in spawn all the year round. In this as in

other respects much has yet to be learned as to their habits, but doubtless much light will be thrown on the subject and experience gained through the efforts of the angling association which it is suggested should be formed—an idea which I am glad to observe has already received the enthusiastic support of some of the most influential and best known sportsmen in Natal.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 5th June next :—

Richmond.— Yearling white ox with brown spots on head and neck and brown legs, no brand.

Reported by Mr. C. P. Lewis running on his farm at Arnold's Hill.—Brown he goat, no marks and no brands.

Springfield.—Red mare, branded TO, with foal at foot, long tail. This mare has since died of horsesickness. Red mare, branded CD, long tail, dark red, untrained. Dark bay filly, aged two years, long tail, unbranded. White pig, (boar), tall, long snout. Black pig (sow) short, long snout.

Ladysmith.—Black ox, branded JG, tip of left ear cut off. Black and white ox, branded JG, right ear slit twice, tip cut off left ear. Black ox, branded JG, tip cut off left ear. Black ox, right ear swallow tail, end cut off left ear, no brands. Black ox, a little white on both thighs, cut in both ears, no brands visible Ox, right ear swallow tail, white brush on tail ; the latter two oxen are old. 4 bastard sheep, branded R or B on near side.

Nqutu.—10 Kafir goats, no brands.

Woodstock.—Bay mare, star on forehead, legs black up to knees, right hind foot white, hog mane.

English Poultry.

ACCORDING to the *Profitable Farm and Garden*, at Heathfield, in Sussex, the great centre of the poultry rearing and fattening industry, the turn-out of dead poultry is estimated at nearly the value of £150,000 sterling per annum. One of the largest fattening establishments at Heathfield is stated to turn out about 100 dozen chickens per week. Rearing and fattening are, however, both distinct businesses, and whilst the latter may be carried on independently as a profitable business, the former is always combined with something else to make it pay. Generally speaking, land is laid down for grass, and dairying is combined with poultry in order to make the calling profitable. It is stated at Heathfield that three acres and a cow, with poultry, provide a decent living.

In this respect, though the area of ground required be larger, South Africa will beat Sussex any day. We can give a case in point from Wynberg, where a gentleman who arrived with the proverbial half-crown in his pocket managed to amass within seven years a fortune of £30,000. Unhappily this overwhelming success proved too much for him, with the result that he went in for Rand shares and committed suicide within ten years. —*Wynberg Times.*

Farmers' Accounts.

By Arthur Barnett.

(*Continued from page* 46, *No.* 2.)

COST BOOK.

BEFORE passing on to the concluding portion of my remarks, which will be addressed more particularly to the small farmer who from choice or necessity elects to keep his own accounts, I would say to all farmers who can spare the time, or can command the necessary assistance, keep a cost book (a small ledger costing, say 2s. 6d. will do, or a blank book ruled as per Form No. 1). If properly filled in this book will show at a glance the profit or loss on any crop, and should well repay the little trouble involved in the few entries necessary. It can also be adapted for sheep dipping, so as to show cost per score of sheep dipped, results, &c., as well as for tree planting, poultry, and dairying.

STOCK BOOK.

The illustration (No. 2) speaks for itself, but as a book ruled exactly in the manner shewn is not stocked by the stationers, and too much time would be needed in the ruling of a blank book containing the requisite number of pages, a small day-book could be bought for about 3s. which would answer the purpose with the addition of another column for "Numbers" or "Quantity." In this case the money columns would be ignored as such and used simply as single columns.

A Simple System for Small Farmers.

The cost book and stock book as mentioned above are equally useful on large or small holdings. Assuming, however, that the ordinary farmer's time is too fully occupied during the day to allow of his devoting any portion of it to his accounts, and that half-an-hour to an hour in the evening is all that he can spare for this object, I shall only advocate the following simple method as being the "irreducible minimum" of book-keeping for the average farmer, anything short of which leaves him open to a charge of grave carelessness, not to call it by a worse name, should misfortune at any time overtake him. The supplies required to start with are as under :—

1. One or two books of "Bought of" forms for making out bills of produce, &c., sold, with carbon leaves for keeping duplicates; also a book of "Receipt Forms."
2. A scrap book, large size, such as is used by children for pasting in pictures.
3. A diary, with, say, three days on a page.
4. A cash book, specially ruled, as per Form No. 3.
5. A journal, thinnest obtainable, ruled as per Form No. 4 (the cash book and journal can be in one book if twenty pages or so of the latter ruling be printed and bound to follow, say, 180 pages of the former).
6. A rubber stamp, "Paid," with date, or a blue pencil, and a bottle of gum or paste.
7. Ink, pens, ruler, blotting-paper, &c.

Cash Book.

The cash book, item No. 4, would have to be specially ruled to order, as nothing of the sort is stocked by the local stationers. One or two Maritzburg firms have expressed their willingness to print and keep same in stock should the demand justify this step; the book would then come much cheaper. Including the cost of printing and binding this book, the total bill for stationery should not amount to £2, and this cannot be considered excessive.

The multiplicity of columns necessitates rather a wide cash book, but in practice it will be found that the larger the number of columns in use the clearer the resulting information will be, and that the filling in of the figures under their separate head-

ings entails practically no additional trouble so long as it is done at the time when the transaction takes place. The headings of the columns can, of course, be varied to suit individual cases, as those which would be suitable for the stock-breeder might be quite wide of the mark for a poultry farmer, agriculturalist, or dairyman. These columns when totalled up will show what the farmer has received and expended under the various heads during the month, quarter, or year, as the case may be.

If anything be sold for cash on the spot, the money received should be at once entered on the left hand side of the cash book under the one or more headings concerned, as well as in the "Total" column, and a receipt should be given, care being taken to fill in the rough details of the sale on the counterfoil of the receipt book for further reference if needed.

Cash received should always be paid into the bank if a bank account be operated on at all, and payments of every kind should be made by cheque only ; thus the bank balance as reflected in the cash book should at all times agree with the balance shewn in the bank pass book, if to the latter be added the amounts of any outstanding cheques. Should a discrepancy appear it will be found that the bank have debited the farmer's account with a "ledger fee" or an item for "exchange," or possibly "interest on overdraft" if the farmer fails to keep a vigilant watch on his balance. Should this be the case, a cheque should be written to cover these charges, and handed to the bank, so that a corresponding entry could then be made in the farmer's cash book. Thus a constant check is kept on the bank account, and if the pass book be sent frequently to the bank to be written up, and be examined carefully on its return, any mistake or dishonest act is quickly discovered.

A farmer may say, however : "Yes, that is all very well, but I frequently require money to pay out for small matters on the farm where a cheque would not be convenient, also for household and personal expenses, where loose cash is essential." To this I reply always, as far as possible, anticipate your requirements by writing and cashing beforehand a cheque sufficient to cover your needs ; but if you have failed to do this and wish to use the money you may have in hand awaiting your next trip to the bank, take the money, but *write a cheque for the amount*, payable to "wages," or "house expenses" or whatever heading it is you want the cash for, and pay in this cheque as part of your next deposit, so as to keep your cash book and pass book in harmony.

The amateur bookkeeper who attempts to keep accounts where payments are received and made, sometimes in cash and at other times through his bankers, is certain to meet trouble and annoyance, as oftentimes small sums in cash are disbursed and no record is kept at the moment and no receipt taken ; afterwards the memory is ransacked in vain for an explanation of the shortage, whereas if the payment had been made by cheque, the counterfoil would be there to prove it. Similarily, if all monies received be paid into the bank, the duplicate slips in the deposit book will always show when any cash has come in, and has not been duly entered in the cash book. It will be found most satisfactory to enter up all cash receipts and payments on the evening of the day on which they took place, if this cannot be done at the moment.

INVOICE.

When anything is sold on credit, an invoice should be made out in pencil on one of the "bought of" forms, setting forth number or quantity, price and amount of each item, and a carbon sheet should be inserted between that form and the next below it, by which means an exact copy is kept. The invoice should be sent with the stuff sold or by the first post : the duplicate is to be pasted into the scrap book.

SCRAP BOOK.

This has a double purpose to serve. The first half is for the accommodation of the duplicate invoices mentioned above ; these should be securely pasted into the scrap book well up to the left hand edge of the page, always leaving a space on the right hand side, in which remarks can be written if desired. To economise space, one invoice can be pasted over another, so long as none of the figures are covered up. The latter half of the book is to be devoted to

merchants' and other accounts for goods supplied to the farmer on credit. The prompt forwarding of accounts for everything he buys should be insisted on by the farmer, and these should be treated in the same way as the invoices. When a payment is made either to or by him, the farmer should erase the amount from the scrap book, either by using the rubber stamp, if he have one, or by writing "paid, such a date," legibly, in blue pencil, across the bill concerned. If the payment be merely "on account," he will write the words "paid £— on account, such a date." By this means, the risk of ever paying an account twice over is avoided. Under no circumstances should a document be removed from the scrap book. If a receipt is to be given let it be written out on another form. A prudent farmer will not allow his accounts with the merchants to run on too long without settlement, and he will do his best to get in any outstanding debts within a reasonable time, but should an account at either end of the scrap book remain uncancelled, it is as well, at the end of every three months or so, to cancel all such by the words "carried forward" in blue pencil, and to commence the following month by entering the names and amounts of these at the top of the page, before pasting in any more bills. This saves the trouble of having to wade through a number of pages in search of unpaid accounts, and brings them afresh to the memory.

STATEMENT.

The Statement as per form No. 4, may be prepared annually, half-yearly, or at any time after a stocktaking, but possibly the best time for a farmer to summarise his position would be during the winter (say 30th June, for Natal), so that as far as possible his last season's crops will by that time have been turned into cash, and the expenditure on account of the following season will not be large. The profit shown in the specimen statement here given represents the nett improvement in the farmer's position for the year ending 30th June, 1900, after paying all household expenses and outlay of every kind, and after writing off £157 10s. for depreciation of buildings, furniture, and implements. This specimen statement alludes to a previous one: in making out the first statement, however, there need only be one entry on the left hand side, viz., "sundry creditors," and the balance, instead of showing the nett improvement for the year, will represent the farmers' position at that date; subsequent statements would be prepared as per specimen. If a ledger were kept, this statement, which is merely an arbitrary summary, would be superseded by a proper balance sheet and profit and loss account, made out from the ledger itself, but where the farmer has practically or entirely to dispense with outside assistance, I think that a statement of this kind, based upon a periodical stocktaking (which can be effected with very little trouble) will, in conjunction with the cash book and scrap book already alluded to, fully meet his requirements. Care should be taken to include everything in the statement. Such things as wool or produce in the broker's hands, a wagon or cattle on loan to a neighbour, creamery or coal shares, etc., might easily be overlooked. It is always well to write a liberal amount off furniture, implements vehicles, &c.; in fact, to look at the value of all such assets from the point of view of a possible auction sale, rather than to take their cost too much into consideration. This remark applies with even greater force to buildings, fences, &c., when same are erected on hired land where no agreement exists as to taking over of same by the landowner on expiration of lease or otherwise, as the heavy expenses connected with their taking down and removal seriously detracts from their value as assets. Live stock, generally speaking, should be valued at slightly under the current market rates for the district, without regard to what they stood at the year before. Wool, mining poles, forage, etc., should not be valued at the full price which they would realise if sold in a distant market, as they are naturally not worth as much while still on the farm: a liberal percentage should always be allowed to cover cost of conveyance, agency charges and such like.

Should there be anything in the foregoing remarks which is not sufficiently explicit, I shall be pleased to give further advice in the matter of accounts specially suited to his case, to any farmer addressing me through the Editor of the *Journal*.

COST BOOK.

.....ACRES.....ROODS.

MEALIES.—No. 3.....1900.

Date.	Charged With.	Price.	Amount. £	s.	d.	Date.	Yielded.	Price.	Amount. £	s.	d.
1900. Oct.	Ploughing— Boys, Days					1901. May.	Muids				
Nov.	Sowing and Harrowing— Boys, Days						Muids to Acre		„	,	„
	Seed, Bags										
	Manure, Tons						Profit per Acre, £.....		„	„	„
Dec.	Weeding— Boys, Days						Balance, being Loss on Crop				
	Cultivating— Boys, Days										
1901. May.	Reaping— Boys, Days										
	Carting— Boys, Days										
	Superintendence										
	Balance, being Profit on Crop										

.....ACRES.....ROODS.

POTATOES.—No. 1.....1900.

Date.	Charged With.	Price.	Amount. £	s.	d.	Date.	Yielded.	Price.	Amount. £	s.	d.
1900. Dec.	Ploughing— Boys, Days					1901. Apl.	Bags at				
	Manure, Tons										
	Planting— Boys, Days						Bags to Acre		„	„	„
	Seed, Bags										
1901. Jan.	Weeding— Boys, Days										
	Earthing up— Boys, Days						Profit per Acre £.....		„	„	„
Feb	Spraying— Boys, Days						Balance being Loss on Crop				
Apl.	Gathering— Boys, Days										
	Superintendence										
	Balance, being Profit on Crop										

CR.

...ay ...her ...ge.	Travelling and General Expenses.	Household and Personal Expenses	Wages.	Total.	Drawn from Bank.	Date.
d.	£ s d	£ s. d	£ s. d.	£ s. d.	£ s. d.	1901.
0	4 2 6	37 10 0	35 0 0	117 7 6	117 7 6	
	...	...	...	92 10 0	92 10 0	March 27
	...	...	...	25 10 0	25 10 0	„ 30
	...	...	4 10 0	4 10 0		
	0 15 0	...	6 0 0	6 15 0		
6	2 0 0	5 15 0	...	8 7 6	19 12 6	April 3

CASH BOOK.

Dr. RECEIPTS. Cr. EXPENDITURE.

Date.	Per.	Live Stock.	Wool.	Grain.	Forage.	Hay.	Potatoes.	Timber.	Firewood.	Dairy Produce	Eggs and Poultry.	Fruit and Vegetables	Sundries.	Total.	Deposited in Bank.
1901.		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
	Brought forward	20 0 0	35 10 0	27 0 0	8 15 0	3 0 0	7 5 0	...	7 0 0	13 2 6	4 15 0	3 2 0	6 5 0	135 14 6	135 14 6
March 29	W. Jones	36 0 0	.	...	...		...	...	...	...	...	..	3 0 0	39 0 0	39 0 0
April 2	Smith & Sons	.	57 10 0	...	12 10 0		20 0 0	..	...	...	...	...	...	90 0 0	
„ 2	Model Dairy	.	...	...	...		...	...	...	7 5 0	1 10 0	...	...	8 15 0	98 15 0
May 4	Market	...	...	...	...		...	6 0 0	3 15 0	...	...	1 6 9	1 5 0	12 6 9	
5	T. Robinson	..	...	37 5 0	...		15 15 0	...	..	...	...	...	...	53 0 0	65 6 9

Date.	Per.	Live Stock.	Imple-ments.	Building Material.	Fencing Material.	Seeds.	Manures	Sheep Dip.	Other Supplies.	Railway and other Carriage.	Travelling and General Expenses.	Household and Personal Expenses	Wages.	Total.	Drawn from Bank.	Date.
1901.		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d	£ s. d.	£ s. d.	£ s. d.	1901.
	Brought forward	...	4 10 0	5 0 0		13 5 0	9 0 0	...	6 15 0	2 5 0	4 2 6	37 10 0	35 0 0	117 7 6	117 7 6	
March 27	J. Raw & Co. . .	78 0 0	...	...	...	4 0 0	...	3 0 0	7 10 0	...	...	...	...	92 10 0	92 10 0	March 27
„ 30	Steel, Murray & Co. .	...	7 15 0	9 10 0	3 10 0	...	4 15 0	...	...	...	..	...	...	25 10 0	25 10 0	„ 30
April 3	Kafirs	...	...	...	...	...	...	...	...	...	...	...	4 10 0	4 10 0		
„ 3	W. Thomas	..	...	..	..	...	...	..	...	...	0 15 0	...	6 0 0	6 15 0		
„ 4	Self	.	...		...	...	...	...	...	0 12 6	2 0 0	5 15 0	...	8 7 6	19 12 6	April 3

STOCK BOOK.

BASIC SLAG.

RECEIVED.					ISSUED.				
Date.	From.	No. or Quantity.	Description.	Remarks.	Date.	To.	No. or Quantity.	Description.	Remarks.
1901. Jan. 1	On hand ...	2 Tons	English	Cost £4 15s. per ton in Maritzburg.	1901. Jan. 12	No. 3 Mealie Patch ...	1½ Tons	English ...	Per Native, Jim.
Feb. 10	Steel, Murray and Co. ...	3 „	English	Cost £4 12s. 6d. per ton in Maritzburg.	„ 15	D. Brown ...	½ „	„ ...	On loan.
„ 12	D. Brown ...	½ „	German	Loan returned.					

CATTLE.

Date.	From.	No.	Description.	Remarks.	Date.	To.	No.	Description.	Remarks.
1901. Jan. 1	On hand ...	107	2 Bulls, 17 Dairy Cows, 78 Mixed Cattle, 10 Calves	Including 30 Mixed Cattle on halves with J. C. B.	1901. Jan. 7	Died	2	Oxen ...	Lungsickness.
					„ 13	Died to date	3	„ ...	„
„ 31	Increase ...	4	...	Calves born.	Feb. 3	Missing ...	1	Dairy Cow	Strayed.
Feb. 5	Walton and Tatham ...	23	Mixed Cattle ...	Bought on Ladysmith Sale at £14 per Head.					
„ 8	Recovered ...	1	Dairy Cow ...	Missing on February 3.					

ANNUAL STATEMENT.

DR.

1899.		£ s. d.	£ s. d.	£ s. d.
July 1—To	Assets as per last Annual Statement:			
,, ,,	Cash in Hand and Bank	377 10 0		
,, ,,	Less Sundry Creditors	60 0 0		
			317 10 0	
,, ,,	Fixed Property ...		2,300 0 0	
,, ,,	Live Stock ...		3 350 0 0	
,, ,,	Other Assets ...		452 10 0	
1900.				
June 30—To	Sundry Creditors :—			
,, ,,	(Accounts owing by me)		49 7 6	
				6,469 7 6
,, ,,	Balance, being nett improvement in my position for the year ending June 30th, 1901			335 19 0
				£6,805 6 6

CR.

1900.		£ s. d.	£ s. d.	£ s. d.	£ s. d.
June 30—By	Cash Assets :—				
,, ,,	Cash in hand ...	32 6 6			
,, ,,	Cash in Bank ...	272 10 0			
				304 16 6	
,, ,,	Sundry Debtors :—				
,, ,,	(Accounts owing to me)	85 0 0			
,, ,,	Less Doubtful Debts ...	8 5 0			
				76 15 0	
,, ,,	Fixed Property :—				
,, ,,	(Land, Buildings, Fences, &c.), valued last year at	2,300 0 0			
,, ,,	Less Depreciation on Buildings, &c. ...	100 0 0			
		2,200 0 0			
,, ,,	Plus Additions during year	185 0 0			
				2 385 0 0	
,, ,,	Live Stock :—				
,, ,,	47 Horses, value ...	578 0 0			
,, ,,	123 Cattle, ,, ...	1,300 0 0			
,, ,,	1,105 Sheep, ,, ...	823 0 0			
,, ,,	597 Goats, ,, ...	447 15 0			
,, ,,	35 Pigs, ,, ...	38 10 0			
				3,187 5 0	
,, ,,	Furniture :—				
,, ,,	Valued last year at ...	300 0 0			
,, ,,	Less 12½ per cent. for Depreciation ...	37 10 0			
		262 10 0			
,, ,,	Plus Additions during year	61 10 0			
				324 0 0	
,, ,,	Implements and Tools	100 0 0			
,, ,,	Less 20 per cent. for Depreciation ...	20 0 0			
		80 0 0			
,, ,,	Plus Additions during year	28 0 0			
				108 0 0	
,, ,,	Mining Poles, value			130 0 0	
,, ,,	Wattle Bark, ,,			50 0 0	
,, ,,	Grain, ,,			70 0 0	
,, ,,	Fertilisers, ,,			23 0 0	
,, ,,	Forage and Hay, ,,			35 0 0	
,, ,,	Crops not Reaped, ,,			37 10 0	
,, ,,	Sundries, Stores, &c., value ...			74 0 0	
					6,805 6 6
					£6,805 6 6

Dairying in Australia.

THE HON. F. R. MOOR'S IMPRESSIONS.

(*Continued.*)

THE following is a further instalment of the pamphlet :—

Testing Acidity of Cream.

During the last two seasons many systems have been adopted at our factories for recording the acidity of cream before churning. It is unfortunate that one standard system was not carried out. At many places alkaline tablets are used. Some use acidimetric tablets. Others use phenolphthalein as an indicator, and an alkali—either lime water, caustic soda, or potash solution—to determine the percentage of lactic acid. Again, a difference is found in the method of applying the various tests. One adds the solution of pure cream, another to a 50 per cent. cream solution, and the next to a $33\frac{1}{3}$ per cent. solution.

The data recorded is of the greatest value to the buttermakers themselves, but difficulties are met with when an attempt is made to compare experiences. Working from so many standpoints is prejudicial to mutual improvements—the policy of the Australasian Butter and Cheese Factories Managers' Association. It would assist the progress of the industry if that body were to discuss this matter and agree to the adoption of a uniform system as a standard. Doubtless a comparison could be made by finding the percentage of lactic acid per the respective systems. Hitherto this was impracticable, as the rules available failed to give corresponding results, either the tablets or the tables being incorrect. About 0.6 per cent. of lactic acid is the quantity required to be developed in cream before churning. The percentage should range from 0·55 to 0·65 per cent. of acid.

The system that gives best satisfaction is known as the Titration method. This test is based on the fact that if an alkaline solution is added to an acid solution a point is reached where the mixture is neither acid nor alkaline. Then, if an alkali of known strength is used, all that remains necessary is an indicator by which to tell when the point of neutrality is reached.

The apparatus required for the test is a 20 c.c. burette for measuring the cream, a 50 c.c. glass-stoppered burette for lime water, a cup, a glass stirring rod, and a medicine dropper, a bottle of full-strength lime water, and a bottle of phenolphthalein. The method of operating is to measure with the burette 20 c.c. of the cream to be tested into the cup, then rinse the burette with an equal quantity of rain water into the cup. Into this mixture put four drops of phenolphthalein indicator with the medicine dropper. Fill the 50 c.c. burette up to the top of the graduations with lime water. Let the lime water go into the cup slowly until the pink colour no longer disappears on stirring. The quantity of lime water taken to produce this permanent pink colour determines the amount of lactic acid present.

Temperature for Churning.

Generally 60 deg. may be quoted as the churning temperature.

If the temperature be too high an undue loss takes place in the buttermilk; the butter will be soft, and cannot be readily handled, and the quality may be injured. If the temperature be too low, time is wasted in churning. It is always better to be a little low than high in temperature for churning. When fresh or sweet cream is churned the temperature needs to be lower in order to recover as much of the butter as possible. Equally good results are obtained at one place at 60 deg. as in another at 54 deg. at the same time of year. The proper temperature also varies slightly in the same places at different seasons—the range being about from 54 to 62 deg. Owing to the rise that takes place in temperature when churning, the cream needs to be lower in the summer as compared with the winter time. This variation is accounted for by the relationship or proportion that the liquid and solid fats in the butter bear to one another. The melting point of butter varies according to the pasture, the period of lactation of the cows, and the season of the year.

The buttermilk should be daily tested in all factories. In some apparently well-conducted places at the present day the loss sometimes amounts to 0.5, and even one per cent. of butter fat. Through carelessness, want of refrigerating power, or lack of opportunity to attend to this branch of the business, buttermilk is at times run away from the churns as rich in butter fat as new milk. On one occasion the buttermilk was kept from one churning of 1,200lbs. of cream. The cream was unripe, and at too high a temperature. This buttermllk was properly ripened and cooled, then put back in the churn and churned again, when it yielded 108lbs. of first-class butter; and as there were four churnings a day at the factory the annual loss at this rate would be serious.

Once in a life-time is sufficient to meet with such an experience, and be impressed with the importance of keeping a check or the results of the churn.

Assurance has been given by factory managers on more than one occasion that if the value of the waste in skim-milk and butter-milk could be estimated since their companies started business, it would amount to more than was invested in buildings and plant; in many cases to some thousands of pounds.

This state of affairs is almost at an end now, and directors of companies are every day recognising what their managers mean when they agitate for more refrigerating power. They are also becoming better acquainted with what constitutes the proper qualifications and duties of a manager. Unfortunately, there are still a few who think that a manager is engaged and paid more for his manual labour than for his brains and experience.

If a man works hard with his hands from daylight till dark, it is most unreasonable to expect him to study and look after those vital points upon which so much of their success depends.

Churning.

The churning should begin slowly, and if the churn has a tight lid the gas should be allowed to escape till its generation stops. Care should be taken that the speed of the churn is not so great as to carry round the cream without causing concussion. With ordinary box-churns 40 revolutions per minute are deemed fast enough. The churn should never be filled too full with cream; two-thirds full is sufficient.

If the speed is too slow the process is needlessly prolonged. Practice will soon determine the proper speed to drive the churn at. Should the butter not come in half-an-hour, or thereabouts, the cream is not ripe enough, or it is too low in temperature, or there is too much of it in the churn, or the speed of the churn is too slow. When the cream is breaking cold water should be added, and all the corners rinsed down. The churning has to be continued till the butter is about between the size of sago and rice. As soon as the churn is stopped the buttermilk should be run off. If unnecessary delay takes place the milk coagulates and becomes difficult to get rid of.

When the buttermilk is run off more cold water should be added, and a few turns given to the churn, and then run off. Another rinsing ought to be sufficient. The main point to be studied in washing, or rather rinsing the butter in the churn, is to get the buttermilk away thoroughly and readily with the least possible quantity of water. The butter is then taken to be worked.

Working the Butter.

A certain quantity — not more than the capacity of the machine—should be weighed and placed on the worker. After working the moisture out, ½ ounce to the lb., or 3 per cent. of best dairy salt should be added. Many prefer to add 4 per cent. of salt. If the butter is intended to be kept for a considerable time a preservative may be added with the salt, but never more than one-half per cent. or ½ lb. in 100 lbs. of butter.

Recent decisions in England indicate that it is injudicious on our part to have anything to do with preservatives, and where they are required the above proportion should not be exceeded. Some of our most successful factories have never used more than that quantity. The quantity of salt is arrived at by the taste of the consumers. If the market demands more or less salt, by all means supply that demand as long as the quality and prices are not jeopardized. The percentage of

salt should always be arrived at by weighing both butter and salt so as to secure uniformity.

The working of the butter should distribute the salt evenly, and bring it in contact with all the particles in the first operation. That point is best determined by the number of revolutions of the worker, or by time. To arrive at the proper time, a number of samples may be taken off at intervals, then placed aside for twenty-four hours and examined. The samples showing streaks or unevenness in colour indicate that they have not been worked long enough.

The one that does not show unevenness in colour, and that has been on the worker for the shortest time, points out the time necessary. This time varies according to the style and speed of the worker in use, and slightly on the consistency of the butter. It must always be remembered that the salting should be thoroughly done in the first working, and the less working that will bring that about the better for the butter.

The butter should then be placed in a cool room till the next morning, and then put through the worker for the second time to remove surplus moisture before packing. Between the two workings it is not desirable to set the butter hard, as it then receives a grinding on the worker that injures the texture. In packing, the tare of each box should always be taken —for local trade 56½ lbs. should be placed in the box, and 57 lbs. for export trade. The extra weight is to provide for a loss that takes place, and it ensures the turning out of 56 lbs. when it reaches the retailer.

The butter should be firmly packed so that no air-holes are left in the butter, nor spaces in the corners or up the sides of the box. A good plan is to strip and examine a box of butter occasionally.

It is false economy to use inferior parchment paper for lining the butter-boxes. The boxes should be placed in the cool room, and the temperature reduced before sending away to market.

It is a comparatively easy matter to make a fair quality of butter under favourable conditions. It is a science to be able to make a choice butter possessing good keeping qualities under varying circumstances. The art of butter-making is yet in its progressive state. Our best specialists in the business are still learning something, and they all recognise that much remains to be learned, and as a strictly definite rule cannot be followed in butter-making, each must adapt himself so as to secure best results under existing local conditions.

(*To be continued.*)

Peas.

"ARATOR" in the *Advertiser* gives an interesting account of his observations on various peas cultivated by Mr. A. Wilkinson, Ottawa. The following is extracted :—

We were first shown near the house some few plants of a bean which is called the Bourbon, and which is a good climber, and was covering some trees to the height of 20 feet or more. This Bourbon bean is almost black in colour, and gives the most luxuriant growth of vines and leaves.

The Florida Velvet Bean is well known and is a mottled bean covering the ground well.

An Indian bean called Machikotti is also largely grown. This bean is a luxuriant climber, and has been growing in Natal for many years, and was probably introduced by the Indians.

Mr. Wilkinson had at one time a native pea (Imbumba), but this has been lost, and is not so good as other kinds.

The Louisiana cow pea is a multi-coloured pea about the size of the ordinary field pea.

We rode through a field of Florida velvet bean, and it was one mass of vines and leaves to 2½ to 3 feet in height. The horses floundered through, catching their legs in great ropes of vines twisted together. Getting through this, we came to a field of Bourbon pea, and the riding was rather worse, but Mr. Wilkinson comforted us by the assurance that we should reach a road soon ; this we soon did, or were told so, we had to take Mr. Wilkin-

son's word for it, so thickly was it covered with a luxuriant growth of peas. These fields are a sight, and we know as certainly as we can know anything, that the nitrogen which will be assimilated from the atmosphere by such a growth of a leguminous plant, must immensely enrich the soil; besides, the return of the mass of vegetable growth to the land will supply that humus in which all our lands have, through successive croppings, become so deficient. It is a great object lesson to see such a large acreage carrying such a wonderful growth of such a dark green colour. Other fields we saw, where the various varieties of cow-peas were growing on land in which mealies had been previously planted, and, as the mealie stalks gave the peas something to climb on, instead of their having to run backwards and forwards on themselves, the effect was even more striking. In places not a sign of mealies could be seen, the peas have grown right over the tops of them, and a level mass of luxuriant foliage nearly six feet high was the result. The peas cover the mealies after the cobs are formed, and to some extent dried, and the pea foliage will wither off so that there will be no difficulty in getting at the mealies. The Louisiana cow-pea is not such a climber as the other varieties, but grows more on the ground, and is, therefore, suitable for growing between canes, or in orchards. In Louisiana these peas are planted between the rows in ratoon canes, and have an almost immediate effect on the crop, and Mr. Polkinghorne tells me that he has grown them between his plant canes this last season, and is so satisfied with the experiment that he intends treating a larger acreage in this manner during the coming season.

This is the fourth year that Mr. Wilkinson has grown cow-peas, but he has not yet taken off any canes from cow-pea lands; there is, therefore, only the luxuriance of appearance to judge by, and, on this test, Mr. Wilkinson places the Bourbon first, then the Louisiana cow-pea, then the Indian, and the Florida velvet bean next, but, of course, as nitrogen gatherers, and consequently as fertilizers, this order may be changed upon actual test. In planting cow-peas and mealies, the mealies are planted about a month before the cow-peas, and cow-peas can be planted in normal seasons up to the end of January. Any land prepared early, that is land which may be ploughed and be perfectly clean in March or April, Mr. Wilkinson plants with a field-pea, the same that the Indians grow, to sell as green peas. This keeps the ground clean, and enriches it, and the crop will go a good way towards paying expenses, and these peas can be planted up to the middle of May.

Mustard and Rape for Sheep.

"FARMER," in the *Times* writes :—I had an opportunity recently of inspecting a forty-acre field of mustard and rape grown by Capt. Mackay's manager, Mr. R. Sykes, at Dalton, Weenen County. Mr. Sykes, who had valuable experience of English farming before emigrating to Natal, is greatly impressed with the value of mustard and rape to the sheep-farmer, and for two seasons now he has demonstrated to my satisfaction that this crop can be grown to perfection here, and at a very trifling cost, compared with turnips, winter oats, and other feeds usually grown for sheep.

No manure was given directly to the mustard and rape, but one portion of the field was manured last season for mealies, and the other portion had a similar dressing two seasons ago. Yet both plots are exceedingly good, and contain an enormous quantity of feed of the very best description for fattening sheep upon. I estimate that the yield will be quite equal to a good crop of swedes, without counting the second growth, which will doubtless be heavy if the season continues favourable. The crop is in two stages for convenience in feeding. One portion was sown about the middle of February, and the other almost a month later. The earlier sown plot will, of course, be fed off first, and by the time that the second plot is fed down, the first should be

grown up again sufficiently to afford a further good supply of feed. This second growth should come in towards the spring, when it will prove a very welcome addition to the turnips and other feed.

The fact that impressed me most forcibly with regard to this crop was its cheapness, and the ease with which it was grown. Not only was there no direct outlay for manure, but there was no hoeing to be done, and the seed only cost ninepence per acre. The land, I need hardly state, had been well ploughed a couple of times this season, but beyond this, and the necessary harrowing and rolling, there had been no expenditure upon the production of the crop. The crop has cost less to grow than a similar acreage of winter, or other oats, in the days before the rust put a stop to the growing of this cereal, for the seed cost only ninepence per acre instead of about fifteen shillings, and the quantity of feed grown is far in excess of what used to be obtained from winter oats.

The mustard and rape was sown broadcast at the rate of 3lbs. of seed per acre. the seed being mixed in the proportionof three of rape to one of mustard. Mr. Sykes has also a large field of swedes which he has grown for both the cattle and the sheep, for he has not altogether discarded roots for sheep in favour of mustard and rape, although their principal food during the coming winter will consist of the latter crop.

Return of Fruits, Plants, and Vegetables, &c.,

Examined under Proc : 37, 1900. For the month of March, 1901.

Date.	Description.	Quantity.	Imported from.	Ship.	Remarks.
1901.					
March 7	Ornamental Shrubs & Bulbs	1 Case	Southampton	Galician	Free of Pest.
„ 10	Seed Pototaes	67 Baskets	„	Greek	„ „
„ „	Fodder Potatoes for Seed ...	1 Crate	„	„	„ „
„ „	Peaches, Apples, &c... ...	161 Cases	Capetown	Scot	„ „
„ „	Seed Potatoes	389 „	Melbourne	Ras Dura	„ „
„ „	Peaches	1 Case	Capetown	Scot	„ „
„ „	Grapes	135 Baskets	„	„	„ „
„ „	Apples	76 Boxes	„	„	„ „
„ „	Grapes	366 „	„	„	„ „
„ „	Apples	10 „	„	„	„ „
„ „	Apples & Peaches	171 „	„	„	„ „
„ „	Potatoes, Seed	25 Bags	„	„	„ „
„ 17	Apples, Peaches, Plums, &c.	308 Cases	„	„	„ „
„ 21	Seed Potatoes	247 „	Melbourne	Beira	„ „
„ „	Eating Potatoes	53 „	„	„	„ „
„ 27	Eating Potatoes	10 „	„	„	„ „
„ 15	Live Trees	20 „	New York	Isel Holme	Admitted by Papers A & M 335/1901, without examination.

C. B. JONES,

Examining Officer, Durban.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of March, 1901.

STATIONS	TEMPERATURE (In Fahr. Degrees).				RAINFALL (in inches).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1900.	Total for same per'd from July 1st, 1899.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	80·8	66·9	87·3	59·6	9·04	25	1·98	19th	34·18	22·93
Stanger...	82·0	64·1	94·0	60·0	4·92	26	1·53	18th	31·23	20·53
Verulam	84·2	70·9	95·0	65·0	6·08	17	1·65	15th	32·44	21·03
Greytown	80·0	62·2	88·0	52·0	5·76	21	1·98	29th	26·96	22·35
Newcastle	...	59·1	...	55·0	7·27	17	1·96	1st	34·68	...
Estcourt	76·7	56·1	87·0	52·0	4·86	20	1·40	2nd	28·04	24·05
Port Shepstone ...	75·1	...	83·0	...	7·71	24	1·85	7th	35·27	33·34
Umzinto	...	60·9	..	52·0	6.25	10	2·08	7th	27·84	26·23
Richmond	74·8	58·2	88·0	51·0	4·01	14	0·67	1st	28·37	30·73
Maritzburg	78·8	56·3	92·0	51·0	9·04	22	1·77	29th	29·52	27·31
Weenen	84·1	59·3	95·0	54·0	2·96	16	0·50	29th	26·22	19·91
Impendhle	79·1	53·8	86·0	50·0	6·96	14	1·48	30th	29·00	28·32
Hillcrest	72·1	60·9	84·0	52·0	8·66	23	3·62	16th	32·51	...
Mapumulo	80·0	61·4	95·0	55·0	8·59	22	3·85	2nd	31·55	28·19
Nongoma	74·6	60·1	85·0	55·0	5.90	12	1·08	30th	38·36	26·06
Umlalazi	76·5	61·5	90·0	47·0	5·28	10	1·88	19th	...	...
Melmoth	77·2	60·5	92·0	53·0	4·91	21	0·87	9th	29·55	17·02
Ubombo	76·0	61.6	84·0	58·0	3·80	15	0·50	17th	29·23	23·47
Eshowe...	76·8	62·8	89·0	57·0	7·38	19	1·76	19th	43·95	...
Point	...	..	...	...	7·35	16	1·72	18th	25·35	22·35
South Coast Junction	...	...	. .	...	10·83	23	3·24	16th	...	...

OTHER STATIONS.

Estcourt	...	...	85	51	4·78	20	1·00	2nd	29·23	25·22
Adamshurst	...	...	82	52	6·83	25	1·69	16th	24·37	26·44
Hilton		...	86	49	7·03	23	1·19	24th	28·87	34·88
P.M.B. Tn.Bush Valley	...	...	...	...	10·31	21	1·86	1st	36·16	51·06
Ixopo, Gorton... ...	...	...	80	56	1·55	17	0·38	29th	12·36	17·24
Ennersdale	..	..	...	...	6·26	17	1·25	13th	...	...
Mid Illovo	...	...	79	53	5·80	17	2·01	2nd	33·22	23·60
Ematoma	...	...	...	...	7·34	19	1·03	5th	...	...
Ottawa	...		..	...	6·78	18	1·80	16th	32·59	22·78
Mount Edgecombe ...	...	...	88	62	7·71	17	2·08	19th	36·48	17·69
Cornubia	...	...	...	...	8·03	...	...	...	40·57	23·31
Milkwood Kraal ...	...	...	...	...	6·35	...	..	...	26·96	18·38
Blackburn	...	...	...	.	7·39	...	...	...	30·78	21·99
Saccharine	...	...	...	...	7·41	...	...	...	37·06	27·60
Prospect Hall... ...	..	...	..	...	10·03	...	...	...	38·06	...
Clairmont	...	...	..	...	12·59	12	4·10	16th	36·07	24·25
Equeefa	...	...	85	61	4·74	17	1·56	2nd	28·73	24·03
Umzinto, Beneva .	..	...	...	...	4·28	14	1·04	1st	27·31	26·69

History of Introduction of Trout into Natal.

By JOHN C. PARKER.

MR. JOHN C. PARKER, Tetworth, Curry's Post, in his letter to the Minister of Agriculture, requesting the transmission to Dr. Gilchrist, the Cape Biologist, of the following report on the introduction of trout into Natal, remarks :

"When Dr. Gilchrist was in Natal recently he asked me to put in writing for him what I know of the introduction of trout into this Colony.

"The records of the committee for introduction of trout and salmon were burnt in the Town Hall when it was destroyed by fire ; and the information enclosed herewith is taken from the note books I kept at the time for my own use. The record is incomplete as the note book for 1892 cannot be found."

In 1882 having seen most of the rivers flowing through the Midlands of Natal and from the Drakensberg Range, and thinking from their appearance that they would be suitable for trout, I wrote to the Editor of the *Field* asking him how I should proceed in endeavouring to introduce trout in the Colony.

My letter was handed to the late Mr. Buckland, who sent it on to Sir James Maitland, owner of the Howictown fishery.

Sir James Maitland wrote, making me an offer of ten thonsand trout ova. The Castle Line of steamers brought them to Natal gratis, and the Natal Government Railways carried them to Pietermaritzburg free of charge. Every facility was given me to enable me to reach my destination 13 miles north of Howick. The railway at that time terminated at Pietermaritzburg, and the late Mr. Wm. Doig, of the Crown Hotel, lent me his omnibus to bring the eggs up to Tetworth.

The voyage between England and Durban in 1882 was longer than it is now, and with a land journey of 30 miles at the end of it from Maritzburg the chances of success were small.

The result was that out of 10,000 ova only 18 eggs hatched out ; these alevins were so weak that they only lived a few days.

On Sir James Maitland learning all the facts of the case he advised me to try again, and once more, in 1883, sent me another lot of 10,000 ova ; but these fared no better than their predecessors.

In 1889, Mr. Cecil Yonge, member for Pietermaritzburg County applied for and obtained a grant of £500 for the introduction of trout and salmon. A committee of three (C. A. S. Yonge, Esq., M.L.C., Lt.-Col. Henry Vaughan, R.A., and J. C. Parker) was appointed to carry out the work.

The site selected was on the farm Boschfontein, belonging to M. Hutchinson, Esq., five minutes' walk from the railway, between Balgowan and Lidgetton Stations on the N.G.R. The stream used for the hatching boxes takes its rise in the bush, is fairly clean, and has a temperature varying from 56 degrees to 64 degrees.

The hatching boxes and filters were copied from the designs given in Sir James Maitland's "History of Howictown"

David Hunter, Esq., General Manager, Natal Government Railways ordered a short platform to be erected at Hutchinson's Crossing, at which any trains might be stopped in the service of the hatcheries —the mail train excepted.

Ova imported. (Supplied by Mr. Armistead, Dumfries) :—

	S. Fario.	Fontinalis.	L. Leven.	S. Salar.
1890	20,000	...	10,000	...
1891	35,000	*10,000	40,000	25,000
1892	50,000	25,000	75,000	25,000

Expenditure in connection with the introduction of trout and salmon into Natal :—

	£	s.	d.
February, 1890, to 30th June, 1890	438	8	5
1st July, 1890, to 30th June, 1891	498	10	1
1st July, 1891, to 30th June, 1892	340	7	8
1st July, 1892, to 30th June, 1893	57	3	6
	£1,334	9	8

*A present from Mr. Armistead.

The first ova arrived at the hatcheries on March 8th, 1890. They began hatch-

ing on March 10th. Hatching finished March 13th. Fry began feeding March 24th.

1890.

Summary of results :—

Alevins dead ...	... 1,591	
Fry ,, ...	... 917	
Fry turned out in Umgeni ...	... 550	May 10th.
Fry turned out in Bushman's River ...	500	May 7th.
Fry turned out in Mooi River ...	... 330	May 2nd.
Fry turned out in Bot. Gardens, P.M.Burg	50	
Fry turned out in Boschfontein Stream ...	12	
(Hatcheries)	3,950	

Of the 10,000 Fontinalis, only 29 fry lived to be turned out. They were put into the Yarrow, a tributary of Karkloof, and have never been seen since.

1891.

Ova imported :—S. Fario, 35,000; L. Leven, 40,000; S. Salar, 25,000; and a present from Mr. Armistead, 10,000 Fontinalis.

The following rivers were stocked :—

Umvoti ...	500
Tugela ...	500
Tetworth ...	129
Klip River ...	410
Little Tugela	500
Umkomaas ...	249
Umlazi ...	230
Myamvubu ... (Reit Vlei)	103
Little Mooi R.	214
Mooi River ...	248
Umgeni (10 miles below Howick) ...	100
Umsindusi ...	150

Only 29 Fontinalis lived to be turned out. They were placed in the Yarrow (Karkloof), and have never been seen since.

TROUT.

Of the Salmon ova, 3,642 hatched. Alevins died, 2,711. Fry died, 137. Fry turned out, 794. These were put in the Umcobene, a tributary of the Umkomaas, on the road to Ixopo.

1893.

This year the public were invited to subscribe to the funds set apart for the introduction of trout. Ova imported in fairly good condition, L. Levens, 50,000. The remainder died on voyage.

Fry distributed :—

Shaw & Trotter, The Yarrow (Karkloof)...	119
S. T. Burger, Lion's River ...	20
J. C. Parker, Tetworth	129
W. Trafford, Middle Mooi River..	64
F. Culverwell, Little Mooi River ...	22
Major Giles, Illovo	251
Green & Cole, Ixopo	151
J. Lindsay	44
— Woodgate	36
Col. Vaughan	110
A. E. Lawrence, Grantly Spruit ...	106
De Jager	25
Stainbank Bros., Isipingo (Umbilo)	90
D. McKenzie, Lion's River ...	40
E. Way, Lion's River	40
— Rennie, Dronk Vlei	167
	1,414

1899.

The Government of Natal received from the Government of Cape Colony a present of 10,000 ova, bred in Cape Colony. These were hatched out at Tetworth.

Fry distributed :—

Lower Umgeni ...	500	
Little Bushman's River	500	
Mooi River ...	400	
Lion's River, Lidgetton	500	one of these was caught in Jan., 1901
Karkloof	580	
C. B. Lloyd ...	100	
	2,580	

For Ipolela, 290 died on journey.

1900.

5,000 ova consigned to Mr. J. J. Morton, hatched at Tetworth.

Fry distributed :—

Karkloof and tributaries ...	1,955
Tributary Impolweni	200
Middle Mooi River	200
Kept to breed from	100
	2,455

1892.

Ova imported.—S. Fario, 50,000; Fontinalis, 25,000; L. Leven, 75,000; S. Salar, 25,000; and, in addition, a present of Salmon Ova from His Grace the Duke of Roxburghe. All records of the work done at the hatchery this year are lost. The ova came out in two shipments. One steamer broke part of her machinery, and was detained four days in Lisbon for repairs. The ova on board, including all the Salmon, died before reaching Durban. Ova, if carefully packed, arrive in Durban very near the time of hatching, and any delay on the journey is fatal.

I believe that this year the rivers Ingagane, Ingogo, and Lotene were stocked.

Copy of letter from Dr. H. Beckford, Grahamstown, Cape Colony, December, 1900.

"About 1894, Dr. Walt. Atherstone caught, at the Kowie West Pier, a fish, which, on examination, proved to be a Salmon (Salmo Salar).

(Sgd.) H. BECKFORD, M.D."

Farmers' Conference.

ELEVENTH ANNUAL GENERAL MEETING.

THE eleventh annual general meeting of the Natal Farmers' Conference met in the Y.M.C.A. Hall on the 16th inst., Mr. T. Hyslop in the chair. The proceedings were fully reported in the daily Press of the Colony. There were also present: Mr. W. J. Mirrlees (vice-president), and the following delegates:—

Maritzburg: P. D. Simmons, J. H. Potterill; Durban: F. F. Churchill, Geo. Armstrong; Umvoti: V. Verton and W. Slatter; Weenen: H. Blaker; Richmond: A. Cooper, J. Marwick; Ixopo: A. Stone; Lion's Rivor; B. Hutchinson, W. Adams; New Hanover: E. Peckham, J. A. Westbrook; Inanda: J. Polkinghorne, L. Acutt; Noodsberg Road: H. Rosenbrook, F. Reiche; Howick: J. Hyslop, J. Parker; Nottingham Road: B. Greene, W. Henwood; Richmond Road and Camperdown: J. D. Alexander, D. Malcolm; Richmond: Peter Flett, W. Comrie; Mooi River: G. R. Richards, G. L. Sinclair; Klip River: R. Horsley, F. R. Bloy; Ixopo: C. E. Hancock; Underberg: F. A. Hathorn: Dundee: W. Craig, F. Turton; Farmers' Club: Capt. Montgomery, B. B. Evans; Lower Tugela: Col. Addison, T. T. Colenbrander; Little Tugela: F. King, J. G. Hattingh; Gourton: W. C. Stockill; Upper Tugela: G. L. Coventry, J. W. Starton; Upper Biggarsberg: A. S. Carbarns, A. R. Brown; Malton: W. Baynes, W. R. Comins; and M. S. West (secretary).

EXPERIMENTAL FARMING.

Under the auspices of the Farmers' Conference, Mr. W. J. Mirrlees, of Tongaat, on the evening of the 16th inst., delivered an interesting lecture in the Y.M.C.A. on "Experimental Farming." Mr. Hyslop presided. At the close of the lecture questions were put and answered, and the thanks of the audience were conveyed to Mr. Mirrlees by the chairman, who expressed the hope that similar lectures would be a feature of future meetings of the Conference.

Central Sugar Mills in Queensland.

THE following is taken from an article on central sugar mills in *The Queenslander*:—Apart from the private capital invested in connection with these central mills, the State has already advanced £496,045 — roundly speaking, half-a-million of money—to assist the cane-growers in their endeavours to minimise the employment of coloured labour. The whole of the ramifications of the industry, both in private and public enterprize, show the necessity for a proportion of coloured labour, but a small amount when compared with the enormous benefit the industry is to the white population. Of the money expended £349,582 has been distributed within and £146,463 outside the State. The figures carry their own lesson. Of the half-million, £386,696 has been spent on mill machinery, buildings, tramways, and rolling-stock, and £109,075 in wages to Europeans, the erection of mill machinery and buildings and rations. Of the total expended, not one penny has gone to pay for coloured labour. It will be well if that point is fully studied.

Now, it is very important for those

who regard the central mills as having solved and settled the labour question to remember that much of the field work is done by Polynesians. They are employed in clearing land, in planting cane, in trashing cane, and in other work for which white labour is not available. It must also be remembered that any attempt to interfere with this labour will bring about a good deal of the disturbance in the industry which was experienced between 1885 and 1892. Then there is the point that the State has endorsed the industy with the money of the taxpayers generally under the conditions for recruiting Polynesian labour which are at present in existence.

It will be seen that in many cases the central mills are struggling along under conditions of finance which privately-conducted enterprises could not stand. Attention might be especially directed to the statements as to the cost of sugar manufactured and the price realised; also, to the amounts owing to the Government for interest and redemption money. The central mill system is not in such a a flourishing state that it can afford to submit to any disturbance in labour conditions.

Correspondence.

To the Editor of the Agricultural Journal.

PRAIRIE GRASS.

DEAR SIR,—I enclose you the heads or ears of a grass said to be an English grass, and which I have noticed growing in orchards under the trees and about homesteads in the upper part of East Griqualand. I would be much obliged if you could give me a name for it. It keeps nice and green all the winter, appears to stand drought well, and stock are said to be very fond of it.—Yours, etc.,

GEO. C. STAFFORD.

The Prairie,
Scotston Post, Polela.

Mr. J. Medley Wood, A.L.S., of the Botanic Gardens, Durban, kindly replies to the Editor's request for determination as follows:—

"The grass of which you send a specimen is Bromus uniloides (H.B.K.) (often called prairie grass). It is supposed to be a native of South America, but has been introduced into most tropical and subtropical countries. I have collected it several times in the upper districts, but have never seen it on the coast. Baron Mueller says of it:—

'From Central America to the subalpine zone of Northern Argentina. In Australia called the prairie grass. It has spread over many parts of the globe as naturalised. The writer saw it disseminated on the mountains of St. Vincent's Gulf as early as 1847. It is one of the richest of grasses, grows continuously, and spreads rapidly from seeds, particularly on fertile and somewhat humid soil, and has proved, as a lasting and nutritious fodder-grass or pasture-grass, one of our best acquisitions. Very early out in the season for fodder. Kept alive in the hottest and driest parts of Central Australia, where it was first introduced by the writer of this work. In Norway it comes to perfection up to lat. 67.55. Chemical analysis in early spring gave:—Albumen, 2.80; gluten, 3.80; starch, 3.30; gum, 1.70; sugar, 2.30 per cent.'

Whether this has been confirmed by experience I am not in a position to state, but I think that I have heard that our farmers have not a very high opinion of it."

[Mr. Lloyd, Commissioner of Agriculture, on being shown the sample of grass, recognised it as a grass which he has had growing on his farm Hidcote for a long time. He, in common with many others, has a high opinion of it. The grass requires good land, and, possibly from partiality to shade, Mr. Lloyd finds that it thrives best in his orchard. Five-and-twenty years ago a few acres of this grass were annually cultivated at Brynbella by Mr. Lloyd's father, the late General Lloyd.]

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inanda & Ndwedwe	Lungsickness	H. Gillespie ...	Avoca.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein.
		,,	W. Ralfe ...	Ennersdale.
		Lungsickness	J. T. Howell ...	Doornkop.
		,,	Joeisa ...	Klipfontein.
		,,	Toonyani ...	Chieveley.
J. Button ...	Estcourt, South of Bushman's River	,,	J. Mattison ...	Klipstone.
		Scab	C. P. F. Marais ...	Stockton.
		,,	H. E. Kirby ...	Klipfontein.
		,,	A. Lawrance ...	Grantly.
		,,	W. S. Crart ...	Springvale.
		,,	W. E. Oates ...	Oatsdale.
		,,	W. Gillot ...	Gladstone.
		,,	T. Robinson ...	Mount Pleasant.
		,,	H. W. Smith ...	Molbetstone.
		,,	S Shoemann ...	Twyfelfontein.
A. H. Ball ...	Weenen ...	,,	H J. Hurd ...	Weston T'Lands
		,,	C. P. F. Van Rooyen	Mona.
		,,	G. R. Van Rooyen	Vitooria.
		,,	R. J. J. Van Rooyen	Bird spruit.
		,,	,, ,,	Doornkloof.
		,,	L. J. Lotter ...	Waterfall.
		Lungsickness	Jogozalah ...	Woodford.
		,,	A. B. Bell ...	,,
		,,	Kamela and Kuhlawomhlaba	Inkasene.
		,,	Secwa... ...	Baviaan's Krantz.
J. J. Hodson ...	Lion's River ...	Scab	Jas. King ...	Lyndoch.
		,,	Jas. Morton ...	Tweedie Hall.
		,,	H. Steadman ...	Woodlands.
		,,	C. Strapp ...	Oatlands.
		,,	G. Woodhouse ...	Haliwell.
		,,	Jas. Ross ...	Gowrie.
		,,	A S. Parkinson ...	Shafton Grange.
		Lungsickness	A. Clark & Natives	Mount Ashley.
E. J. B. Hosking ...	Upper Umkomanzi	,,	H. Gillespie ...	Intimbankulu.
		,,	Native ...	Stirtreimfontein.
		,,	Turnbull & Co. ...	Glen Islay.
R. J. Raw ...	Impendhle ...	Scab	H. J. Martens ...	Wuthering Heights
		,,	H. Phipson ...	Boschberg.
		,,	G. Q. Hamilton ...	Ivanhoe.
		,,	J. W. Brooke ...	Impendhle Store.
		Lungsickness	Crossley Bros. ...	Deepdale.
W. Wilson ...	Polela.	,,	H. Eaglestone ...	Coleford and The Bungalow.
C. E. Hancock ...	Ixopo ...	,,	J. H. Johnson and Natives	Dronk Vlei.
		Scab	Native Pietman ...	Wesley.
		,,	H. W. Chick ...	New Garrett.
		,,	C. Green ...	Gorton.
		,,	C. L. Hammond ...	Sunrise.
		,,	W. K. Anderson...	Maxwell.
		,,	J. Anderson ...	Lilliedale.
		,,	E. S. Clarke ...	Carr End.
		,,	Malambula ...	Location.
		,,	Budoza ...	Hlogozi.
		,,	Qinisani ...	Klipgat.
		,,	Solibamba ...	Lutafa.
		,,	R. Kennedy ...	Cornhill.
A. J. Marshall (Acting) ..	Newcastle	Lungsickness	A. A. Osborn ...	The Mount.
		,,	Native Shallos ...	River View, Ingogo.
		,,	H. P. Beare ...	Glen Hesit, Ingogo.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall (Acting)	Newcastle	Lungsickness	G. L. Fraser	Ingogo.
		,,	J. F. Grant	Hilldrop.
		,,	H. S. Dicks & Sons	The Retreat
		,,	Native Funwayo	Tigerkloof.
		,,	Umbobo & Lugudu	The Gardens.
		,,	Umgodini	J. Adendorff's farm Ingagane.
		,,	Kotshaindoda	N. Dugenaar's farm, Ingagane.
		,,	J. W. O'Reilly, Natives Jonas, and Paplana	Newcastle T'Lands.
		,,	L. H. S. Jones	,,
		,,	J. Hodgson	Belvedere.
		,,	Bob. Salugwanda	Boschhoek.
		,,	A. Nottman	,,
		,,	P. L. Uys	Jackalspan.
		,,	T. Breary	Newcastle Colliery.
		,,	J. Davidson	Lennoxton.
		,,	A. Danks & Fox	Crown Colliery. Newcastle.
		,,	Beckeroo	Lennoxton.
		,,	J. Smith	,,
		,,	— Sheikamier	Newcastle.
		,,	J. J. Exsteen	Manning.
		,,	A. Paine	Mount Prospect
		,,	F. W. Hatley	,,
		,,	E. Parker	,,
		,,	Ramsaroop	Newcastle.
		,,	G. J. Way	Vrede.
		,,	Unjopal & Eseresing	Newcastle.
		,,	A. H. Tatham	,,
		,,	J. W. James	,,
		,,	G. Brown	Wykom.
		,,	Macdonald & Kemp	Lennoxton.
		,,	Natives	Whykombe.
		,,	,,	Droog Plaats.
		,,	J. Pettigrew	Newcastle T'Lands.
		,,	A. Krause	Filexton.
		,,	G. W. Nourse	Rutti & Highton.
		,,	Simeon Ndhlovu	Freda.
		,,	— Hodgson	Newcastle T'Lands
		,,	S. W. Reynolds	,,
		,,	O. Olver	,,
		,,	D. S. Redman	Snipe Marsh.
		,,	R. T. H. Harrison	Lennoxtown.
		,,	F. Ferrier	Henley Farm.
		,,	G. W. White	Ruth.
		,,	C. R. Savory	Pomeroy and Evin.
		,,	Dr. Ormond	Ingogo.
		,,	Seikomya Datuz	Newcastle T'Lands.
		,,	Loxton & Rudd	Waterfall.
		,,	L. C. Koch	Kabbaslaagte.
		,,	D. Miller	Roseless
		,,	H. Singleton	,,
		,,	E. Graham	,,
		,,	Cooper & Chandley	Newcastle T'Lands.
		,,	Blizzard & Pratt	Ingogo.
		,,	J. W A. Welsh	Paradise.
		,,	— Hanstin	Wykom.
		,,	J. G. Kemp	Heighton.
		,,	G. Star	Lennoxton.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner	Farm.
A. J. Marshall ... (Acting)	Newcastle ...	Lungsickness	G. Wood ...	Heron's Court.
		,,	W. L. Lea ...	Lennoxton.
		,,	J. Mortimer ...	Try Again.
		,,	P. W. Dept. ...	Newcastle T'Lands.
		,,	S. Loxton ...	Lennoxton.
		,,	D. Dewar ...	Newcastle T'Lands.
		,,	W. A. Ross ...	,,
		,,	Nehorasing ...	,,
		,,	— Roberts ...	,,
		,,	C. Watson ...	River Bend.
		,,	H. James ...	Kalbasla agte.
		,,	J. R. Watt	Horn River.
		,,	G. Matthews ...	Shakespeare.
		,,	H. Loxton ...	Lennoxton
		,,	A. & S. J. James...	Paradise.
		,,	Natives ...	Hope Farm.
		Scab	C. de Wet ...	Schuinshoogte.
		,,	H. S. Dicks ...	Lennoxton.
		,,	A. J. Middleton ...	Ingogo.
		,,	W. E. Few ...	,,
		,,	F. Johnstone ...	Craig.
		,,	Umkwenesi ...	Alcock's Spruit.
		,,	J. Dicks ...	Vet Klip.
		,,	F. R. Tewson ...	Rooi Point.
		,,	W. A. Lang ...	La Belle Esperance.
		,,	J. Vanderwesthuise	Hartebeestelaagte.
		,,	W. C. F. Napier ...	Eagles Cliff.
		,,	J. A. Vanderplank	,,
		,,	A. P. de Jager ...	One Tree Hill.
		,,	G. J. Way ...	Vrede.
		,,	J. W. O Reilly ...	Gordon.
		,,	H. P. Beare ...	Ingogo.
		,,	J. Matthews ...	Shakespeare.
		,,	O Schwikkard ...	Boscabelli.
		,,	G. Star ...	Lennoxton.
		,,	R. S. Miller ...	Goloch.
		,,	W. C. F. Napier...	Newcastle T'Lands.
		,,	C. G. Palmer ...	Dry Cut.
		,,	P. L. Uys ...	Jackalspan.
		,,	W. Dicks ...	Hope Vale.
		,,	S. J. James ...	Stafford.
		,,	J. W. Shuttleworth	Duck Ponds.
		,,	S. W. Reynolds ...	Newcastle T'Lands.
A. S. Parkinson ...	New Hanover ...	Lungsickness	E. Bentley ...	York.
A. Hair	Umgeni and Borough of Pietermaritzburg	,,	T. Dawson ...	Zwartkop.
		,,	C. Oldfield ...	Wilgefontein.
		,,	J. Neden ...	,,
		,,	Tobea ...	,,
		,,	Shaik Modeen ...	,,
		,,	Cidia	,,
		,,	R. Coster ...	Slang Spruit.
		,,	W. Oldfield ...	Ambleton.
J. Chaplin ...	Klip River	,,	T. Ellison, G. Cowan, and G. E. Robinson	Ladysmith Town Lands.
		,,	Discharged Transport Cattle	Matowan's Kop.
		,,	W. J. Tully ...	Grobelar's Kloof.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Scab	Loot Sheep ...	Van Reenen's Pass.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	— Spence ...	Reunion Estate.
W. Freer ...	Upper Tugela ...	"	J. W. Coventry ..	Rangeworthy.
		"	D. Munger ...	Bedale.
		"	Mr. and Mrs. C. C. J. Bester	Bester's Hoek.
			W. Freer ...	Acton Homes.
		"	G. Von Beneker ...	Drill.
		"	H. H. Reed ..	Mains.
		"	W. O. Coventry ...	Acton Homes.
		"	H. Francis ...	Bedale.
		"	G. Spearman ...	"
		"	G H. H. Coventry and Native	Rangeworthy.
			G Spearman ...	Spion Kop.
		"	F. Zunkel ...	Klein Waterfall.
		"	T. H. Creevin ...	"
		"	Dr. Jones ...	"
		"	D. G. Giles ...	Upper Tugela Magistracy.
		"	J. Reed ...	Roode Bent.
		Scab	J. Scheepers ...	Sand Drift.
		"	C. Crawley ...	Waterloo.
G. Gielink ...	Zululand ...	Lungsickness	M. Titlestad ...	Ntingwe.
		"	Dinizulu ...	Hlabisa District.
		"	Noiwana ..	Nqutu.
		"	Natives' Cattle ...	Melmoth.
		"	Sebambindoda ...	Kwamagwaza.
		"	G. Havemann ...	Insuzi.
		"	Military Loot Cattle	Warbeck, Elizabeth, and Barneveld Melmoth.
				Stone Hill.
A. Klingenberg ...	Umsinga ...	"	Umbambo ...	Buffalo River Location.
		"	Ulunglala ...	Uithoek.
		"	Combrink Bros. ...	"
		"	Mrs. H. Strydom ...	Vermaak's Kraal.
		"	Ngobazane ...	Cleveland.
R. Marshall ..	Dundee ...	"	Marshall Bros. ...	Celle.
		"	— Dammann ...	Henning.
		"	— Frockling ...	Karlsburse.
		"	W. Muller and C. Hellberg	Schroeder's Hope.
		"	—Schroeder ...	Rosenen.
		"	do. ...	Sterkstroom.
		"	— Haynes ...	Maypole.
		"	Military Authorities	Brazil.
		"	A. F. Henderson ...	"
		"	— Stoffel ...	Craigside.
		"	— Ohlsen ...	Sweet Home.
		"	Umquayo ...	Rocky Glen.
		"	Glutz ...	"
		"	Thorn ...	Gedull No. 2.
		"	D. Oppermann ...	Jackalsfontein.
		"	— Botha ..	Dundee.
		"	Cooper & Umbleby	"
		"	Redman ...	Craigieburn.
		"	Natives ...	Domain.
		"	Cooper & Umbleby	Dundee.
		"	A. A. Smith ...	Craigside.
		"	Redman & Nourse	Boschfontein.
		"	J. Landman ...	Hatting Spruit.
		"	— Hearn ...	East Lynn.
		Scab	J. W. Marshall ...	
		"		

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
R. Marshall ...	Dundee ...	Scab	— Ohlsen ...	East Lynn.
		,,	D. Meumann ...	Dundee.
		,,	A. & P. Conyers ...	Rest.
		,,	Natives Sheep' ...	Maypole.
W. A. Hutchinson	Alfred ...	,,	G. Whitelaw ...	Dalemount.
		,,	W. Stafford ...	Sutherland.
		,,	Nqubu ...	Location.
		,,	Ngihla ...	St. Mary's.
		,,	Mpapu ...	Location.
		,,	Camulana ...	,,
		,,	Manxolo ...	,,
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	Faku ...	Mount Alice.
		,,	A. C. Beyers & Sons	Doveton.
		,,	A. P. Vandermerwe	Poortje.
		Scab	J. R. Vandermerwe	Noodhulp.
E. Varty ...	Umvoti—Western Portion	,,	H. L. Francis ...	Rietfontein.
		,,	T. J. & C. M. Botha	Welverdient.
		,,	L. M. J. Nel ...	Schikhoek.
		,,	Bros. P. R. & G. H. Nel	Wonderboom.
		,,	W. Slatter ...	Holme Lacy.
		,,	H. Hansmeyer ...	On Rust.
B. C. Shooter ...	Alexandra ...	Lungsickness	H. Reynolds ...	Inyangweni.
		,,	Umjanise ...	Pasture.
G. N. Perfect ...	Umvoti—Eastern Portion	Scab	L. J. Nel ...	Welgegund.
		,,	J. A. Nel ...	,,

The whole of that portion of the Colony north of the Tugela River has been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
24th April, 1901.

M. J. HIME,
for P. V. Surgeon.

White Legs, Feet, and Blaze in Horses.

"C. L. S." writes to the *Stock Journal*: As the season is approaching for the holding of the horse shows at the Agricultural Hall, I am desirous of drawing the attention of breeders to the fact—and I am astonished to find that it is not more generally known — that where stallions are concerned the foreigner will have none of them with these markings.

The increase of white markings in our horses has become much more pronounced as compared with former years, but their presence does not seem to enter into the calculations of our breeders in the very slightest degree.

White legs mean white feet, and white feet mean brittle feet, and this fact has long been recognised by the breeders of all countries, save dear old haphazard, "muddling through" England.

I happen to have spent from time to time a good portion of my life among stock-breeders in France, Spain, Italy, the Mediterranean, and the United States, and I have from time to time endeavoured to induce the Continental breeders, especially of heavy draught horses, to come over to our shows here and buy some of our breeding stock, with a view to help along horse breeding generally in this country. In, I think, 1897 and 1898, the Government Professor of Agriculture for the West District of France attended officially, and on my recommendation, the Shire horse shows in London, with a view to buying some stallions; but when he saw the amazing amount of white in in them he absolutely and entirely declined to have anything to do with them, and on his second visit hinted to me that

I had brought him over on false pretences!

When I suggest to Italian and Spanish breeders to come to this country for their horse-breeding stock, and I have to own to the presence of white legs, feet, and blaze, they shake their heads and at once decline. In this way the chance of a foreign market for some of our surplus stock is reduced, and this is a fact that should be regarded seriously by our breeders.

These markings are known to be detrimental to the lasting powers of a horse, and yet no attempt is made to limit them or breed them out. They are wonderfully on the increase in many strains of the Shire horse, and, as far as legs are concerned, they now sometimes reach the stifle and beyond.

White, when it once appears, is difficult to confine within given limits. I speak from experience as a breeder in former years, and winner at Smithfield of "improved" (?) Berkshire pigs, a large proportion of which would always appear with white spots on the body and white ears.

I know I shall be told that a chesnut horse, which is a fine goer, and is disfigured with the hideous accompaniments of white legs, feet, and blaze, brings more money in Paris than anywhere else. This is true enough, as Mr. Bartlett will tell you; but Monsieur de Paris is not a breeder, and fortunately for France, her breeders are more long-sighted. The Government *haras* on the Continent are mainly established for the production of hardy, wearing horses for the various armies.

Let us, before it is too late, wake up from our wonderfully self-satisfied position and take a lesson from the foreigner. We can learn much from him, and more still from the United States of America.

African Horses.

"A FRANK CRITIC" has been sounding the praises of the African-bred horse in the *Daily Telegraph*. He says that the management of remount depôts is no such very difficult business if run, as it should be, in the African way. Half-a-dozen Basutos, with a white man over them, will look after a hundred horses. "Your African horse does not require regular exercise. Turn him out to graze, and give him plenty of grub when he comes in at night, and he will get himself much fitter than if you pursue the stereotyped army rule, and tie him up to the lines day and night. . . . . I think there is little doubt that the campaign has proved the African horse to be vastly superior to any other for the particular work required of Mounted Infantry. He will find a living where others will starve, and when dead-beat will come up again fresh and well after a day's rest, whereas the foreigner takes weeks to pull round—weeks he cannot get—with the consequence that he dies. He is small, but will carry surprising weights. The most convincing proof of his abilities in this respect is the way he carries the Boer, for the average Boer must be at least a stone heavier than the average English soldier. A further most important point in the African pony is that he is so quiet that there is much less risk of his stampeding when under fire than there is with the English or foreign horse." In comparing the weights of Briton and Boer the writer seems to overlook the quantity of things the former has to carry on his saddle, whereby the average weight the British horses carry is probably two or three stone more than that carried by the Boer pony. The "Frank Critic" puts in a good word again for the Basuto pony, which, he says, is much the best breed in South Africa. "Efforts should be made to buy every horse that is rideable in Basutoland. Some battalions of Imperial Yeomanry have been mounted on these from the first, a year ago now, and are devoted to their ponies, most of which, in spite of the enormous amount of work done, still survive. If it should be decided to mount the men now going out on African horses, it should not be forgotten that they are small and require a small saddle. The enormous saddles brought out by the first lot of Yeomanry smothered these small ponies, and added unnecessarily to the burden they had to carry."

Preserving Fruit.

IN answer to a question in a recent issue about preserving superfluous fruit, I must mention that bottling is the easiest and most excellent method. To do this you must have air-tight bottles. These have a rather wide mouth, a flat rubber ring, which is placed under the stopper, and a thin zinc rim, which is screwed over all. These bottles I have bought for 4d. apiece retail, but I should think they might be had for half that price if got in any quantity. Boil the fruit until done, with as little sugar as you like; have bottles, stopper and rim hot, and pour the boiling fruit into the bottles to overflowing. Fasten up at once, screwing tight; let cool where you have boiled the fruit. When cold you can give the rim another screw.

Any fruit can be done in this way, and will keep in a cool place for a year or so. Another way of using up fruit is drying on trays with wire netting bottoms; place in sun, in coal oven, or over stoves; when pretty dry they can be put into thin cotton bags in a warm room to finish, giving them a shake now and then. Apples may be peeled, quartered, and cored, and threaded on cheap twine, hung outside in the sun, then after a few days brought into a warm kitchen to finish. Quantities of apples are used up in this way in Canada, and make a very good article for winter use, stewed more slowly than you would the fresh apple.

Another way of preserving all kinds of fruit is what is greatly practised in France and Germany. Take out the kernel of plums, core apples; have a large boiler, put a little water at the bottom and put in some of your fruit; when it boils add more fruit, stirring all the time, putting the fruit in by degrees after each lot boils, until your boiler is quite full, then keep on boiling and stirring for twenty-four hours, never letting it stop or stick at the bottom. It becomes quite sweet enough without any sugar, and is a most wholesome article of diet; some let it boil even thirty-six hours—it becomes a dark brown. Put into any kind of crock. Fruit to be preserved in any of these ways should be pretty ripe.—L.A. in *Agricultural Gazette*, London.

Mottled Butter.

A NUMBER of experiments have been carried out at the Maryland Agricultural Station, in order to ascertain the cause of mottled butter, by Mr C. F. Doane, dairy bacteriologist, who gives his conclusions as follows:—

1. The uneven distribution of salt is the cause of unevenly-coloured butter, spoken of as mottled butter.

2. Washing the butter with water below 40 degrees does not cause mottles. It does, however, make a little more working necessary to thoroughly distribute the salt.

3. The light-coloured streaks or portions of mottled butter are not caused by an excess of casein; but mottles are evidently caused by some physical action of salt on the butter-fat, which causes it to admit more light.

4. Mottles can be prevented by working the butter sufficiently to thoroughly distribute the salt.

5. Butter washed with water at 40 degrees and under, and worked immediately, shows a better grain when sufficiently worked to ensure its being evenly coloured than with any other treatment.

6. Washing butter with water at 40 degrees and under does not injure its firmness when subjected to higher temperature.

In California the fumigation of fruit trees is undertaken by some of the county boards of horticulture. During 1900 the Los Angeles board had nearly 1,500,000 trees treated, being more than double last year's number. Nearly 1,000 tents were in operation, and for the coming season at least 1,500 will be used. Many growers are so satisfied with the results that they are purchasing fumigating outfits. The cost of fumigating has averaged about 40 cents. say 1s 8d.) per tree; but the grower is more than repaid for this outlay, which is less than the cost of spraying the trees affected by scales.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co., write :—During the past fortnight there has been an abundance of all farm and garden produce, and taken all round, good prices have been realised.

Mealies.—Some samples have been as low as 4s. 11d. per 100lbs., including sack, others have been up to 5s. 4d. and 5s. 6d. per 100lbs., including sack. A few new mealies are coming forward.

Forage.—From 4s. 9d. to 12s. 1d., and 13s. 3d. per 100lbs.

Hay.—Large quantities disposed of almost every day; and prices have been everything between 1s. and 3s. 4d. per 100lbs. Bedding from 6s. to 26s. per load.

Potatoes. Market is now being better supplied. Early Rose, from 7s. to 15s. 3d. per 100lbs.; Beauty of Hebron, from 8s. 3d. to 14s. 5d. per 100lbs.; Red Roughs, from 7s. to 12s. per 100lbs.; Up-to-dates, from 9s. 9d. to 14s. 3d. per 100lbs.; Sweet Potatoes, from 1s. 6d. to 5s. 6d. per sack; Magnum Bonum, from 6s. to 10s. 6d. per 100lbs.

Mabele.—There have been some samples of inferior quality, and also some of first rate quality disposed of, and this explains the reason of the great difference in price; while some samples have been as low as 5s. 3d. per 100lbs., others have reached 10s. 6d. and 11s. per 100lbs.

Buckwheat.—Very scarce, and prices have ranged between 13s. 3d. and 13s 6d. per 100lbs.

Onions.—From 20s. to 38s. per 100lbs.

Tobacco.—From 1s. 5d. to 1s 6d. per lb.

Lucerne.—From 7d to 1s. 2d. per lot.

Pumpkins.—From 1s. to 11s. per dozen.

Butter.—Every morning market has been well supplied, and prices have fluctuated between 9d. and 2s. 2d. per lb.

Eggs.—Prices are almost now prohibitory. Several mornings some samples were down to 1s. 6d. and 1s 9d. per dozen; but when housewives have been compelled to pay as much as 4s., 4s. 5d., and 5s. 9d. per dozen, one is almost forced to the conclusion that poultry rearing must be a paying speculation.

Poultry.—Fowls, are now realising from 2s. 6d. to 3s. 9d. each; ducks, from 5s to 10s. 3d. per pair; turkeys (cocks), from 8s. 6d. to 14s. 6d. each, hens, 6s. to 6s. 3d. each.

Fruit.—Apples, bananas, guavas, naartjes, lemons, limes, oranges, papaws, pears, and pine-apples offered daily.

Vegetables.—Beans, beetroot, cabbages, carrots, chillies, lettuce, marrows, onions, pumpkins, rhubarb, tomatoes, and turnips offered daily.

Sundries.—Beef, from 3½. to 6½d.; pork, 2½d. to 9d.; mutton, 3d. to 8d.; bacon, 4d. to 6d. per lb.; bam, 6d to 11d. per lb.

Wood.—From 5d. to 11d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes :—

General.—Complaints are general as to the slackness of trade, and wholesale parcels are very difficult to move.

Mealies.—Things could hardly be much worse than they are in this staple. Reserves of old crop appear to be far heavier than anyone ever anticipated, and in view of the export last season of fully a hundred thousand bags to Cape ports, it would seem that the total yield of the old crop was quite sufficient to supply all demands without the necessity of importation. As it is there are now many thousands of bags still in the hands of farmers and speculators which are badly weevily, and hardly worth 10s. bag, whereas 17s. could easily have been obtained some months back. Something like 150,000 bags of imported mealies have recently been landed at this port, and, meantime, the new Coast crop is pouring in. The yield over the Colony is believed to have surpassed all records so that the moral for farmers would seem to be "sell at fair market rates," thus ensuring a paying price in a good season like this, and so prevent all possibility of importation.

Potatoes.—The new autumn crop is now coming in freely, and quotations are fast declining from the very high figures lately obtainable. During the first fortnight of April, 20s. a bag was an average price, but a big drop occurred recently, and on Saturday last, 12s. 6d. was touched on our market. The crop is a splendid one, and in any event will pay the grower well.

Mabele.—Good samples bring 16s. per bag of 203lbs, but as the crop is larger than for many years past, a considerable decline on this figure must be anticipated.

Other lines are normal and calling for no special comment.

Mr. A. N. Pearson, the Victorian Agricultural Chemist, says :—"The extent to which the soil moisture may be conserved by sufficient stirring of the surface soil has not yet been fully recognised in the dry districts. The difference of evaporation from a soil with the surface stirred and from one not stirred may, in a hot summer, be equivalent to 1in. or more rain a month. By putting the disc harrow over the stubble immediately after harvest, and harrowing the young growing crop once or twice, even an old paddock not fallowed may retain sufficient moisture to ensure a substantial crop."

The New South Wales Dairy Expert has reported to his Minister that he has succeeded in isolating the micro-organism which causes "fishiness" in butter. If this proves to be correct it will be good news to Australian dairymen, as once the source of the trouble is known the search for a cure or for preventive action is much simplified. No doubt many who know of the careful search that has been carried out for many years in all parts of the world for the germ in "fishy" butter without success will suspend judgment on Mr. O'Callaghan's report pending confirmatory evidence of the correctness of the same.

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AND MINING RECORD.

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CONTENTS.

Horse-sickness Investigations.

(By H. WATKINS-PITCHFORD, F.R.C.V.S.)

(*Continued.*)

THAT the horse is the subject of attack by winged insects needs no demonstration. One recalls such instances as the Gad-flies, the Horse-flies, and various species of the Simulidae or Breeze-flies and the Tsetse-flies, etc., etc.

The well-understood fact that stabled animals suddenly "turned out" are more subject to the disease than horses which are not stabled or fed, shows in this connection the experience that in man a new comer is more liable to mosquito attack on exposure in an infected district than the habitual residents of the locality, and that some obscure protective influence is subsequently more or less rapidly developed, though never probably to the degree of complete immunity.

That this is a tolerance, or adaptation of the host to the parasite, rather than a selectiveness on the part of the insect, seems probable by the reaction to the bite in man generally becoming less and less marked with successive attacks of the

insect. That such protective influence is a matter of kind as well as degree seems possible, for instances have been brought forward where a locally established immunity failed to protect in a contiguous district. As an illustration of this point the writer was credibly informed of the case of a resident in the northern part of Natal, who was not troubled by mosquitoes on his own farm —although they abounded there—but who was victimised to a considerable extent whenever he stayed at a friend's farm, distant some twenty miles, and that the owner of this farm, himself exempted from trouble from his own mosquitoes, nevertheless was attacked when visiting his friend's farm.

This experience, strange as it may seem, becomes not altogether incredible the more one understands of the various species, their methods of breeding, habits, etc., some propagating their species almost solely in rain water pools, others in slowly flowing watercourses and drains, and others, again, in tubs, tanks, cisterns, etc.

It does not, therefore, seem irrational to suppose that a somewhat similarity of immunity to attack may be acquired by animals not stabled and always exposed, for in this way it seems possible that a protective influence may become established in such animals, enabling them to render inert, by acquired local reaction of tissue or other defensive process not understood, the attack which otherwise would afford a favourable nidus or entry for the casual organism.

Such apparent increase of susceptibility in animals suddenly turned out may, of course, be held to be due to alteration of environment, etc., producing in this way a possible "chill" or reduction of resistive power. This action may be argued also to involve risk of producing the disease by other means than that of inoculation by insect-bite.

The disease, in Natal at least, and probably wherever the malady is known, occurs at a time of the year when atmospheric conditions are favourable to the activity and spread of the mosquito and winged insect life generally. The heavy rains surcharging the atmosphere with moisture and raising the level of the subsoil water, forms with the alternating excessively warm days of summer an essential and ideal condition for the breeding of the mosquito and allied species of insect, and though the same may be held to be the case with most of the lower forms of life, the constant presence of surface water makes this season of the year one adapted to the propagation of this species of insect in particular.

That no risk is incurred during the actual time of rain seems a wide-spread theory in Natal, and is an important fact when considered in this connection.

Mosquitoes do not fly abroad during rain, and rain is not understood to check the spread of zymotic disease generally. That freedom from risk during rainfall should have been noticed to exist reflects credit on those who, without knowledge of periods of incubation, etc., have made so acute an observation ; which, however, remains to be substantiated.

Cases of horsesickness have been reported from parts of Natal as having occurred during the winter months, and at a time when the temperature falls during the night to many degrees below zero. This, if the diagnosis is correct, would point to the ability of the mosquito to withstand such extremes of temperature, and not become incapacitated from using the warm hours of mid-day in order to commit its specific depredations.

That mosquito larvae can withstand the rigours of an artic winter seems definitely proved.

The increase of cases with the advent of the early frosts after a bad horsesickness season seems to point to the possibility of the disease remaining latent in the system of an animal and becoming excited into activity by exposure to low temperature. It is difficult to imagine such causes as those of increased microbic or insect activity giving rise to such increase of cases. The effect of chill or reduced temperature in exciting the malarial symptoms into activity in man is well recognised, and may furnish a clue to this phenomena in the horse.

A matter of more difficult solution under this heading is the question of the

Intermediary Bearer. Assuming the active agency of the mosquito in disemenating the disease horsesickness, the difficulty of establishing the complete life-cycle of the organism, and the identity of the hypothetical intermediary bearer remains, unless the casual organism is always simply transferred from one equine subject to another. It is impossible to altogether exclude the view that perhaps a parallel may exist between the Malaria of man and this disease of the horse, which furnishes several points of analogy. The difficulty of establishing the life history of the malarial organism, and the manner in which mankind becomes its victims have been very great, yet in the case of malaria it was at least possible to demonstrate without difficulty the organism after it had once gained an entry into man's system, the chief difficulty being in showing that it depended solely upon the mosquito for its development and propagation. The maxim of "No mosquito, no malaria," is already passing into a truism.

In horsesickness, however, we have not the advantage of being able to demonstrate a large organism more or less filling the blood corpuscle and developing within it, but we have, as I have said above, to take it for granted that a microbe is concerned in the production of this disease, and, working upon that assumption, we have to endeavour to trace its life history unaided by the eye.

It has been noticed for years that mules partially, and donkeys almost entirely, enjoy a high degree of immunity to attack, as well as much insusceptibility to artificial infection. The possibility of their acting as harbourers of the organism without in themselves manifesting physiological disturbance must not be lost sight of, somewhat in the way that we believe the large game of the Tsetse-fly belts harbour the organism of 'Ngana, or as the acclimatised ox will, while apparently healthy, act as a host to a modified form of the red-water organism (Pyrosoma Bigeminum), and be capable of re-establishing the disease in its acute form in a susceptible animal, or, again, as the native child in a malarial district is the host and the means by which the malaria of man is propagated and maintained.

Such a theory would not conflict with the possibility of direct transference from one acutely infected animal to another, which, in the presence of an active agent, such as the mosquito, might develop into an epizootic of magnitude, or what we should call a "wave of the disease."

It is possible, again, that cases which have recovered from the disease (so-called salted animals), may assume the role of host, and furnish infective material for the propagation of the disease. That this is improbable, however, seems likely from a consideration of the well established fact that the immunity conferred by an attack of the disease is of so short duration and frail character as to lead one to doubt in many cases if recovery confers any immunity at all.

Several distinct attacks may be produced in the same animal at short intervals, and this with so little diminution in intensity that the disease may prove fatal after an animal has successfully resisted three, or possibly four, previous well-marked artificially induced attacks. The theory that such an animal should, during the intervals of those attacks, be harbouring the organism in a modified form seems unlikely, as in such an instance re-infection could probably only occur from a distinct and acute case of the disease.

It seems more probable, therefore, that the organism exists in a modified form in some insusceptible intermediary host if the agency of the mosquito in the production of the disease is to be proved to be a correct surmise. Such intermediary host, however, need not necessarily be an insusceptible equine or even a warm blooded animal at all, for we know that frogs, for instance, are capable of harbouring in their systems forms of parasitic life not dis-similar to the malarial organism, while they are inseparable, of course, from the moist and marshy localities we are led by our experience to look upon as so closely connected with the disease in question.

(*To be continued.*)

Garden Work.

SEVERAL subscribers have recently expressed the hope that it might be found possible to give in every issue some gardening information suitable to the time of publication. We are pleased to state that Mr. W. J. Bell, Florist and Seedsman, Maritzburg, has agreed to supply the information required. Having thorough practical knowledge of gardening in the Colony, Mr. Bell's advice should prove of much value. Garden produce is almost always extremely costly in the towns, and farmers having railway communication should find in the supply of garden produce, as of late years they found in the dairy, another substantial source of income. This development would probably be much facilitated were the Colony to adopt the C.O.D. (collect on delivery) system of the Cape and many other parts of the world.

The Co-Operation of Creameries.

ELSEWHERE will be found a description of the Model Dairy newly opened in Durban. The Company owning the Dairy will act as Durban agents to the Nel's Rust Dairy and to the Natal Creamery of Mooi River. This co-operation of the two colonial creameries is a matter for general congratulation in several respects. The Model Dairy company can serve both Creameries as well as it could serve one, and the dead expense of a second costly establishment for the dispensing of up-country dairy produce is obviated. That dead, unproductive expense being saved is clearly an advantage to all concerned, and more especially to the consumer, for in the end it is always in trade matters the consumer who has to pay. Neither must it be supposed that the disadvantages of a "ring" or monopoly is the necessary sequence of the agreement between the two Creameries to abstain from competition for the Durban dairy-produce trade. British Chancellors of the Exchequer in the old days of heavy indirect taxation used to admit that they were kept in check by the smuggler, and any attempt on the part of the Creameries to take more than fair working profits would be checked by the individual milk and butter producer. This individual, be he the owner of two or three cows in the town or the owner of a big troop in the country, is not only naturally of the most independent character, but is almost constitutionally averse to combination. Whenever and wherever competition may be practicable, this individual producer of milk, etc., may be relied on to make the very most of the opportunity offered. It will be the competition between capital and organisation on one side, and the keen energy of individualism on the other, by which Durban will benefit. Hence the fact that the Creameries are not openly competing in Durban is in no sense a matter of regret but rather, as we have said, a matter for congratulation.

The time for starting the Durban business is, of course, not altogether happy. The Colony, in the first place, is only beginning to recover from the enormous losses occasioned by the late rinderpest epidemic, secondly, the war, in many indirect ways, has greatly enhanced the value of cows, and thirdly, the demands for milk by the military hospitals, and by the large war and British refugee population, has brought about a wholly abnormal condition of things as regards the demand for milk and other dairy produce. The position, however, is only temporary. Cattle have been doing splendidly since the rinderpest, increased interest and intelligence in dairy work are observable throughout the Colony, and everything points to the fact that the time is rapidly approaching when the Colony will not only be able to supply its own demands, but be able to contribute largely to those of the inland colonies.

District Reports.

HOWICK, 7th May.—Up to the present no frost has fallen in this Division, though it may be expected any time as the weather is getting very cold. The absence of frost has greatly benefited the late mealie crop, though, I am sorry to say, the yield will not be more than about half, as compared with other seasons, owing to the drought at planting time. However, I believe the mabele crop will come up to the average of past seasons, as this class of produce can do with less rain than mealies do. During the month of April the rainfall was 3.57 inches. That which fell in February and March greatly assisted in bringing on the grass for the purposes of haymaking. Most of the farmers have finished cutting their hay, which is better than in any previous year owing to its being cut so green, thanks to the late rains. Tons upon tons of this class of fodder are being sent to other parts of the Colony from here, and are commanding a good price. The maximum temperature during the past month was 87 deg., and the minimum during the same period was 42 deg., registered on the 30th ult. According to the rain gauge kept at this Magistracy, I am able to give the rainfall during 1899, 1900, and the first four months of this year, viz., 25.17 in 1899, 20.84 in 1900, and 16.10 up to the 30th April this year, which shows that though the fall last year was less than the previous one, that of the past four months has almost equalled that of the whole of last year. The much-dreaded horsesickness made its appearance during last month throughout the Division, carrying off many valuable animals, but it is anticipated this disease will disappear on the advent of frost. Many horses are suffering from strangles, but as this disease is prevalent mostly among young stock not many have succumbed to it. Cattle are in the pink of condition, and are still commanding good prices, and, as far as I know, lungsickness only exists on one farm in this Division. Sheep also are doing well; a few flocks are infected with scab. For the information of those who indulge in trout fishing, I would remind them that the close season commences on the 15th inst.

J. W. Cross, Magistrate.

NEW HANOVER, 7th May.—The weather has been dry and cool since the last heavy rains. The dreaded horsesickness has made its appearance and has claimed and is still claiming many victims. It appeared on some farms where it has never been heard of before. Many of the cases reported are, however, of horses brought down from the front which are bought up by the farmers in troops of ten to forty on the Maritzburg sales, at an average price of £5 per horse. The mortality among them is great, and as a rule only about 50 per cent are saved. In my opinion farmers who buy later in the winter will do better, the climate then being more similar to the up-country climate.

A. Ritter, Magistrate.

NKANDHLA, 30th April.—The fall of rain during the month has been small. The weather has been very pleasant, and the nights are beginning to get very cold. A large comet was visible in the east on the 25th, at 5 a.m. The Natives are beginning to reap their crops, but in places the mealies are very backward. No locusts have been reported in the District. Several horses died of horsesickness, mostly belonging to the Military. Lungsickness broke out amongst the cattle belonging to the Messrs. Havermann, surrendered burghers. These cattle have all been inoculated, and, so far, no deaths have taken place; this herd has been isolated. I regret to say the transport oxen with the troops still have lungsickness amongst them. There is a large amount of captured stock in the District at the present time. Things, generally, during the month have been most disturbed here in consequence of the lively movements of the Boers along the border. The Nkandhla Rifle Association was called out during the month. I am glad to say all the Europeans have recovered from enteric fever, and the health of the District has been a great deal better during the month.

C. C. Foxon, Magistrate.

NQUTU, 30th April.—During the month there has been a great deal of horsesickness amongst the horses in this District, and very many have died. As a rule the disease does not hold much sway in this District, so that the present season must be regarded as exceptional. Two fresh outbreaks of lungsickness have occurred during the month amongst oxen which were commandeered by the Military, and discharged with a return pass to this District, otherwise the disease has been successfully confined to the herds which were already infected and isolated. Typical early winter weather has prevailed throughout the month, and the rainfall was just sufficient to keep the grazing going. The country is now assuming a grey appearance owing to the grass commencing to "go off," another sign that winter is fast approaching. The springs and streams about the District are still running strongly, thanks to the late heavy rains of the past month. Crops are fast ripening, and the coming month should see the bulk of the Native crops (the only crops in the District) reaped. The health of the residents, both European and Native, is good.

C. Hignett, Magistrate.

UMLALAZI, 4th May.—Since my last report we have experienced very variable and unhealthy weather. The mortality amongst Natives has been exceptionally high, death being due almost entirely to malarial dysentery and malarial fever. The older men state that for some years past the seasons here have been getting more unhealthy, and more similar to those near the Lower Umfolozi Lake Districts, adjoining this District. In more than one in-

stance all the inmates of a kraal have been ill together, notably so in a kraal about a mile from the seat of Magistracy, where four of the inmates succumbed to these diseases in the course of one month, and others are still ill; whilst in an adjoining kraal seven were attacked, one of whom has this day been reported dead. During last week seventeen deaths were reported at this office, and this week twenty-two. Nor have Natives been the only victims, several Europeans having suffered severely, including a railway survey party. The Native police and messengers attached to this department have also suffered from these complaints to a considerable extent during the last few months. I attribute the prevalence of these diseases to the swampy nature of the District, bad water, and the intense heat. My meteorological observations show that during March the rainfall here was 5.28 inches; and in April 2.66 inches. Rain fell on three days in the latter month, the heaviest fall in one day being 1.94 inches, on 4th April. Yesterday and to-day have been showery, and at the time of writing there is every appearance of more rain. I may mention that for several evenings past a very clear and distinct comet has been visible between 6 and 7 o'clock lying a short distance above the western horizon, at an angle of about 45 degrees. The Natives are now busy reaping their crops, which consist chiefly of mabele. This product has yielded an exceptionally heavy crop this year, and beer drinks are now the order of the day. In the ordinary course of events, therefore, we may expect a good number of faction fights, with their usual consequences, viz., cracked skulls, and additional revenue to the Colonial Exchequer. Speaking, however, from considerable experience amongst the Natal Natives, it appears to me that, as a rule, the Zulus in this Province are not so pugnacious over their beer as their brothers in Natal. As stated in a previous report, there are very few cattle in this District, but those few appear to be free from disease and look well. I regret to say horsesickness is again bad, one-third of the horses at the Magistracy having died lately. For some unaccountable reason, game seems to be very scarce this year, several local hunts having lately resulted in empty bags.

J. J. JACKSON, Magistrate.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on 15th June next:—

Howick.—Dun and white cow.

The stock impounded as hereunder will be sold, unless previously released, on the 19th June next:—

Mooi River.—On the farm Oatlands, red heifer, speckled belly, little white on tail, no brand or ear mark. Information by Mr. W. E. Oates.

Mossdale.—Reported by Mr. D. S. Watson running on the farm Bismarck, bay mare, branded on right hip W W. Reported by Mr. Campbell, dark brown mule (gelding), no brands, about 13.2 hands. Dark brown mare mule, branded on left shoulder W P, about 13.2 hands.

Ladysmith.—Small black cow, branded TL on the right hip, stump tail, and ears marked swallow tail. Red and white heifer, branded TL on the right hip, long tail with white brush, with ears marked. Red cow, branded TL on right hip, with half tail, long wide horns. Black cow, branded TL on right hip, with wide horns, half tail, and ears marked. Black-and-white cow, branded TL on right hip, with half tail, ears marked. Red cow, branded TL on right hip, long tail, no ears marked. Red cow, branded TL on right hip, stump tail, ears marked.

Springfield.—Blue cow, right horn broken, short tail, dewlap cut, branded CW. Running on an infected area, farm of A. P. Van der Merwe, light red cow, white stomach, right horn broken, short tail, aged, left ear slit. Light red ox, branded BH, upright horns, six years old. Dark red one-year-old bull, no brands.

Ladysmith.—Grey entire pony, with dark points, sore on wither, white spots under saddle, hog mane and tail, about 13½ hands high, about five years old. Probable value £5. Impounded by F. Thornhill.

The Arabs teach their foals to drink camel's and ewe's milk: he can then be left at home in the tent when his dam is put to work again, and also in future when water is unprocurable he will be satisfied with milk. To teach him to take the milk of the camel and she goat the Arabs take a goat's skin which has been used for years as a milk vessel and inflate it with air; then, holding the opening to the foal's nostrils the holder blows the air into them by gently pressing the inflated bag. Also they crush dates in milk, which give it a sweetish flavour, and coax or force him to taste it; once he has tasted the mixture he will always drink it.

The Characteristics of Demerara Sugar; Seeding Sugar Canes and Faulty Rum.

AT a meeting of the West India Committee on January 24, 1901, Professor J. B. Harrison, the Government Analyst of British Guiana, made some important remarks on subjects relating to the industries of the West Indies. These are reported in the Demerara "Argosy" for February 23, 1901. In referring to a prosecution at Tredegar, which he had attended, when a grocer was fined for selling a sugar coloured with aniline dye as Demerara sugar, he said that the analyst for the defence admitted the presence of aniline dye in the sugar, but thought that Demerara sugars were commonly dyed with aniline dyes, and that sugars so dyed were in consequence known by the trade as "Demerara" sugar. Professor Harrison most carefully impressed on the bench that the colour of the sugar was a minor point, the value of true Demerara crystals being dependent on the flavour and aroma, or "bouquet," retained by the sugar from the cane juice from which it was made; the colour being used by the purchasers merely as an indication of the sugars possessing these characteristics.

Hopes have been entertained of improving the sugar cane by growing seedlings, the result of cross fertilization. On this subject Professor Harrison said that when they were first successful in raising seedlings of the sugar cane, he considered that much of the success was due to natural cross fertilization; but that his colleague, Mr. Jenman, doubted the correctness of this view. They planted panicles taken from an unopened arrow, and succeeded in raising plants from them, thus proving the possibility of self-fertilization taking place. A Java investigator had previously come to the conclusion that, mainly on account of the marked tendency to variation which characterises the seminal offspring of the sugar cane, the method was not a practicable one, as it would, in the majority of cases, be quite impossible to decide whether the plants raised for seed were true crosses or merely sports. Their present standard varieties of canes appeared to be mongrels, with a remarkable tendency to throw back in their seedlings towards an unknown ancestry.

The faultiness of rum has been ascribed by Mr. V. H. Veley and Mrs. Veley to a micro-organism capable of living in a liquid containing over 70 per cent. of alcohol ("Nature," Vol. 56, p. 197, and Vol. 59, p. 339), but this is not confirmed by the investigations of Professor Harrison and Mr. Scard. They found that the microbe was common in tropical sugar factories and distilleries, and could be obtained not only from the bottoms of vats in which faulty rum had been shipped, but also and far more frequently from those which had contained rum about which no allegations of faultiness had been made; and they not only failed to produce faultiness in sound rum by adding this organism, but also in no instance were they able to get the organism to grow, increase or multiply in rum. They succeeded in growing the organism in suitable sugar solutions, but when they added rum in quantity to the solutions containing the organisms in active and apparently vigorous growth, it proved fatal to them. Their investigations showed that, apart from defects in the making of the rum, the main cause of the complaint usually lay in the varying nature of the staves used in making up the packages. Rum from the same vat had been shipped in casks made respectively of relatively uncured and thoroughly cured staves, and on arrival in England that from the packages made of less cured staves had been condemned as faulty, whilst that shipped in packages of cured wood was passed as sound. But even in the case of apparently thoroughly cured wood, when the casks had been kept in bond in Demerara for some weeks before shipment, instead of being shipped soon after having been filled, in some cases the rum was complained of on arrival as being more or less faulty. He urged the necessity of investigating each case of faultiness on its own merits, and of not assigning all cases to any one cause.

Gleanings.

A fur rug which is hardened in the washing and drying may be softened in the following way: Mix together three tablespoonfuls of castor oil, one of glycerine and one of turpentine; rub this preparation into the back part of the rug and let it remain for a week, then rub it with a smooth stone or block of wood. Wipe thoroughly before placing on the floor.

The New Zealand *Gazette* of March 8th contains some interesting particulars of the area sown with green crop and grasses. The grass area is given as over 33,000,000 of acres. Green crops, mainly turnips, 404,313 acres; and rape, 124,318 acres, amount to 638,804 acres—a falling off from previous year of nearly 33,000 acres. The number of sheep is returned as 19,355,195, of cattle 1,256,680, and of swine 250,975.

When fruit trees are to be planted it is good practice to plant alternate rows of different varieties of the same fruit, because the pollen of one variety is often wanted to fructify or fertilise the flowers of another. Thus, if a block of Brandis almonds alone were planted, there would be poor crops of nuts; but if some hard-shells and other varieties were grown alongside, there would be heavy crops of almonds If several acres of stone Pippin apples alone were planted, there would probably be no fruit; but there would be heavy crops if two or three other sorts were planted in alternate rows with them.

How careless we are in respect to the nature of the stuff we purchase and use as food. Anything, for instance, sold as "vinegar" is accepted as genuine, and yet the great bulk of the cheap acidulous liquor that is sold under that name consists of more or less deleterious acids, dissolved in water and coloured with burnt sugar. If we had any proper respect for our health and digestive organs, we would see to it that our vinegars were the fermented product of grapes, or apples, or honey, malt, or some other wholesome substance. Wine and cider vinegars are to be preferred, but malt or honey make excellent and perfectly wholesome vinegars.

An American paper, is summarising the value of ensilage, says that twenty years' experience in the use of the silo has brought out some facts about which all are agreed. First, that a larger amount of healthful cattle food can be preserved in the silo, in better condition, at less expense of labour and land, than by any other method known; second, that silage comes nearer being a perfect substitute for the succulent food of the pasture than any other food that can be had in the winter; third, 30lbs. a day is enough silage for an average-sized Jersey cow; larger cattle will eat more; fourth, a cubic foot of silage from the middle of a medium-sized silo will average about 45lbs.; fifth, for 182 days, or half a year, an average Jersey cow will require about 6 tons of silage, allowing for unavoidable waste.

The 'Revue des Revues" publishes a long and exhaustive article, from which it would appear that the problem of the cure of tuberculosis has been definitely solved by the use of the juice and plasma extracted from raw beef subjected to pressure. The discovery is ascribed to MM. Charles Richet and Hericourt, who are already known for their work in connection with the employment of therapeutic serum.

Some correspondence is going on in the English papers about a new remedy for worms in stock, termed thymol. Professor Ewart, and Mr. Peter Wilson, the well-known veterinarian of Penicvik, have been trying it on a number of foals about six months old with great success, giving it in 10-grain doses once daily for three days, and following it up with an opening dose of castor oil on the fourth day; then, after an interval of four or five days, giving three 15-grain doses at intervals of three days, with a full cathartic dose of castor oil after the last thymol dose. Of seven foals thus treated, one died, one was partially cured, and five entirely.

The famous Luther Burbank states in recent American issues that his "Plumcots," produced by crossing of apricots and plums, are the latest wonder in the fruit line. The fruit has the form of the apricot and the same general outside appearance, but is more highly coloured than either apricots or plums. The rich flavour of the fruit is said to be a revelation of new fruit possibilities. Mr. Burbank also reports favourably on the improvement he has effected in his seedless plums and prunes. Australasian horticulturists will doubtless watch with interest the advent of these latest creations in the fruit line, and should the expectations raised by the statements as to their merits be fulfilled, they will soon become popular in this part of the world.

The horse, say the Arabs of Sahara, should have four points broad—the front, the chest, the croup, and the legs; four points long—the neck, the upper parts of the legs, the belly, and the haunches; and four points short—the loins, the pasterns, the ears, and the tail. All these qualities prove, firstly, that he has real blood in him, and secondly that he is fast, for his form combines something of the greyhound, something of the pigeon, and something of the mahari, or riding camel. The mahari, be it added, is to the common djemel as a thoroughbred is to a cart horse. The Arab idea of what a good horse should be able to do is curiously expressed; he must carry a full grown man, his arms, and a change of clothing, food for both his rider and himself, a flag, even on a windy day, and, if necessary, drag a dead body behind him. Doing all this, he must keep up a good pace the whole day through without a thought of food or water.

Dairying in Australia.

THE HON. F. R. MOOR'S IMPRESSIONS.

(*Continued.*)

BUTTER-MAKING FOR FARMERS.

THE following is a further instalment of the pamphlet :—

Much of the butter produced in the Colony (N.S.W.) is made by farmers and dairymen who find it inconvenient or impossible to dispose of their milk in a creamery or factory. The proper handling of the milk, the treatment of the cream, and manufacture of butter demand consideration separate from that of the factory. As the average run of dairy butter on the market is of much lower quality than that from the factories, there would appear to exist a greater scope for improvement. But owing to many reasons the dairy butter can never hope to get on equal terms with factory output.

The chief obstacle in the way in our climate is the want of refrigeration. It will not pay small dairymen to bestow as much attention, or to provide as perfect appliances for manufacturing butter, as it does when treating it in a large way. In exceptional instances as good, and occasionally a better, article is made on the farm ; but being small in quantity, it is confined purely to the local market.

When a surplus of dairy butter finds its way on the local market, it has to be disposed of at low figures, to allow for mixing up and making into large quantities of uniform quality that will warrant exporting. In some places this handicap can be overcome by the people combining and adopting the factory system.

Attention is specially directed to the regulations on another page regarding the care of milk and cream. Many hints are also given under the heading "Factory Butter-making."

The milk when set in dishes in hot weather often thickens before half the cream rises, and even under ordinary circumstances a greater percentage of the butter-fat is lost in the skim-milk by the gravity system than by the modern separator. Cleanliness and temperature are the great essential points to be studied for successful butter-making. The dairy should be so erected as to permit of its being easily kept clean and sweet, and the temperature regulated.

Every dairy should have a fire-place, or stove, to keep the place dry as well as to regulate the temperature during the winter. Small cheap refrigerators within the reach, and suitable for a small dairy, is a convenience not yet catered for. In the meantime the temperature of the dairy in the summer must be kept as low as possible. A temperature of 60 deg. is the average required, about 65 deg. is the best in winter, and 54 deg. in summer, but it is seldom practicable to get the dairy so low in hot weather.

Speaking of temperature, in how many dairies is a thermometer to be found ? A thermometer in a dairy is as great an essential as a compass on a ship.

A ship can be steered on her course without the aid of a compass, so can butter be made without a thermometer, but how much safer, and what a lot of energy, time and trouble are saved by their use.

Every dairyman should possess a thermometer and use it. A proper one for the dairy costs 1s. or 1s. 6d. Those without any frame are best, as they can easily be kept clean. If it is set in a wooden frame it ought to be removed before placing in the milk or cream. If the frame is put in the milk, it soon becomes foul.

The dairy is unfortunately too often considered a handy depot in which to place all sorts of things. Sometimes a hare or rabbit is left hanging up. Often it is made to serve as a general cool room for fruit, vegetables, and meat.

Even in careful hands those things bring about flies and evil odours sometimes. Milk, cream and butter are great absorbents of odours, and great damage is caused by exposing them to any objectionable smells.

It is not generally known that delicately scented pomades are made by exposing pure fat in thin layers to the scent of flowers. The fat absorbs and retains the beautiful odours.

The natural delicacy, aroma and flavour of nice butter properly made should be preserved.

If these characteristics are spoiled in any way the value of the butter is reduced. The surroundings of the dairy should, therefore, be always kept clean and sweet.

The cream should be mixed always after each skimming is added, and churning should not take place sooner than twelve hours after the last lot has been mixed.

If the churning is done immediately after mixing, the older or riper cream comes into butter first, and the newer or more unripe cream is liable, and often does, run away with the buttermilk. As the matter of temperature is easily disposed of on paper, but often difficult to carry out in practice, it is perhaps better to dwell on it a little longer. To raise the temperature of the cream for churning the vessel containing it may be placed in a larger one, which contains warm water. Stir the cream, and take it out when it reaches the desired heat. Never pour hot water into the cream to raise the temperature.

A well or stream of cool water is a great help on a farm. With cold water a great deal can be done. The cream can be reduced in the same way as pointed out above for raising the temperature by putting cold water in the outer vessel instead of hot. In most places it is the exception rather than the rule to have a supply of cold water. When ordinary means are not at hand, cream can be cooled by putting a wet bag or cloth round the vessel and placing it on a shallow pan of water in a draught of air over night.

Water can be reduced in the same manner for washing the butter. This plan was practised all through the past severe summer with good results. When a sultry close night was encountered a little salt was added to check the souring, and the cream was left over till the following night to be cooled. If there is no air in motion this plan of cooling is not effective. It is the rapid evaporation that causes the reduction in temperature. Water may also be cooled by dissolving a little salt and saltpetre in it quickly. A reduction of up to 10 deg. can be obtained by this means.

In some localities the only water to be had at times of the year is discoloured and muddy.

For the churning, working, salting, packing, and other treatment of butter, the dairyman can be guided by the suggestions for factory butter-making.

Veterinary Departmental Report for March 1901.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I BEG herewith to hand you the Departmental Reports for the month of March.

You will observe little or no falling off in the number of outbreaks of contagious disease in the upper parts of the Colony. Numerous cases are reported both of lungsickness and scab, particularly from the Newcastle Division. Every step is being taken to deal with such outbreaks as they arise, but I fear that under present conditions it will be a long time before we shall be able to show a clean bill of health. During the past month there have been issued from the laboratory 184 tubes of locust fungus, 1,330 doses of Quarter-evil vaccine, 5 syringes, 2 pestles and mortars, 2,033 doses of mallein, 260 doses of Anthrax vaccine, 100 doses tuberculin,

5 bottles anti-diphtheritic serum, etc., besides 7,800 doses of plague prophylactic and 75 doses of plague curative serum.

H. WATKINS-PITCHFORD,
P. V. Surgeon.

April 29th, 1901.

D.V.S. WOOLLATT.

My work has consisted chiefly of the office duties of the Department.

I have made visits to the Clean Quarantine Depôt at Pieters, where the work continues to proceed very satisfactorily. There are about 1,100 head of oxen there, and since the Depôt started we have not had a case of lungsickness in in the Depôt. There have been some cases of lungsickness on the farm Brakfontein among Native cattle ; that portion of the farm, however, has not been used as a Depôt, and has been strictly guarded.

At Matowan's Kop the camp for discharged transport cattle only contains some 383 oxen, many of them having been taken back into military service. There are 20 different lots of cattle on this farm, seven of the lots being under license for lungsickness. There is one herd under license for lungsickness in the Borough of Pietermaritzburg, consisting of one calf. This has since died from the disease.

DURBAN.—D.V.S. AMOS.

There has been little or no horsesickness in the Borough of Durban during the month.

Glanders has been specially reported upon to you.

One fatal case of Endocarditis occurred in a recently imported South American filly.

Redwater has occurred in several imported cows.

A good many animals have been tested at the Compound for tuberculosis ; these are chiefly Australian heifers. Of the 98 tested none have reacted to the test.

I had one very acute case of Urticaria, which had a most successful ending to saline treatment.

HOWICK—D.V.S. BYRNE.

Lion's River Division.

Scab exists in the following flocks, which have been placed under license :— A flock of 550, of which 400 are affected, the property of Mr. H. Steadman, of the farm Woodlands. A flock of 2,800, of which 1,000 are affected, the property of Mr. G. Woodhouse, Halliwell. A flock, the property of Mr. C. Strapp, Oatlands. A flock of 250, the property of Mr. Jas. Ross, Gowrie. All are loot sheep, bought at the Mooi River sale on March 6th, with the exception of the flock of Mr. Ross.

Lungsickness. — The Lungsickness license has again been renewed to Mr. Clarke and Natives, Mount Ashley. Five beasts have now died, or been killed, and six recovered up to date.

Horsesickness.—The only case I have personally seen so far this season of horsesickness I saw during the month. It was a mare, the property of Mr. Young, Court Prosecutor, Howick. I am sorry to say the mare died. I have heard of about six deaths from the disease in this Division so far.

Upper Umkomanzi Division.

Horsesickness is bad in the Upper Umkomanzi Division. They have lost 30 horses this season up to the end of March.

There is no scab in the Division at present.

I inoculated over 600 calves as a preventive against quarter-evil during the month ; all of which have done well.

We have had a lot of rain during March, but stock seem to be doing well all over my district.

GREYTOWN—D.V.S. CORDY.

Scab. - Five fresh outbreaks have occurred during the month, three in the Western Umvoti Division, and two in the Eastern Umvoti Division. The careless manner in which a large number of the farmers in this district look after their sheep is, to a great extent, the cause of so widespread an outbreak of the disease. Having so-called fences on the farm, which, in a great number of instances, are only fences by name, the sheep in most cases have no herd with them, and consequently roam the District at large. Another source of trouble is the non-reporting of an outbreak of the disease to the neighbours on adjoining farms, or to the Stock Inspector. Two cases of this kind have recently occurred in the

Western Umvoti Division ; in both cases proceedings have been instituted for contravention of the Scab Law.

Lungsickness. — No fresh outbreaks during the month.

General.—A number of deaths from gallsickness have occurred in the Eastern Umvoti Division, especially among young cattle.

Blue Tongue has caused the death of a large number of sheep in the Western Umvoti Division during the month.

Horsesickness.—Until the latter part of the month horsesickness had not been very prevalent in the district, but several cases have occurred since the heavy rains have set in. Twenty-two deaths occurred among a troop of twenty-nine pack horses belonging to the Volunteer Department, running at Holme Lacy, but these animals contracted the disease in the Chase Valley, Maritzburg.

The work of the month included the castration of four horses, the treatment of one with muscular rheumatism, one with an injury to the knee, and other ordinary cases.

MOOI RIVER—D.V.S. WEBB.

Equine Influenza or Pink Eye.—A modified and comparatively benign form of influenza has prevailed amongst the horses in this District during the last three months. The principal symptoms have been those of catarrh of the respiratory mucous membrane, viz., thick mucous discharge from the nostrils, cough, a pink to brick-red colour of the visible mucous membranes, elevated temperature, and rapid wasting, from which the animals take a considerable time to recover. Most cases pull round with little or no treatment, although I find those cases which are taken in hand, and given a little care, make much quicker recoveries. The disease pulls the animals down in condition, and it requires good feeding and tonics to again restore them to fit condition for work.

The treatment I have found most beneficial is to feed the patients on good nourishing foods, scalded, with an allowance of green fodder and roots. Steam inhalations, medicated with eucalyptus, which are easily applied by pouring boiling water over blue-gum leaves, and causing the patient to inhale the steam ; the plan adopted by some of using a nose-bag for inhalation purposes is, in my opinion, not a good one, as the patient cannot obtain a sufficient supply of air, and I have frequently seen horses in a fair way to being suffocated by its use. Stimulating the throat and region over the windpipe with a liniment. Medicine is conveniently given in the form of an electuary. A useful one is made with

Extract of Belladonna ...	2 drs.
Chlorate of Potash ...	4 drs.
Ginger	6 drs.
Treacle sufficient to make a paste, about... ...	1½ ozs.

A teaspoonful to be placed on the patient's tongue three or four times daily.

If the temperature is high, a few drachm doses of sulphate of quinine quickly reduces the pyrexia.

When the patient is convalescent, tonics should be administered. I find a solution of arsenic, together with dilute mineral acids and sulphate of iron, given in the food daily a useful pick-me-up.

If animals suffering from "Pink Eye" even in its modified form are put to work, it aggravates the disease, causes a more rapid loss of flesh, and often induces serious complications.

Other cases treated—

Splint in a racing pony.—Treatment : Puncture, firing.

Chronic diarrhœa in a foal.—Treated with Extract of Bael Fruit.

Horsesickness.—Only four cases of this disease have been brought to my notice during the season.

Lungsickness.—This disease does not appear to be gaining ground ; the outbreaks have all a mild character. Many of the sick animals practically recover, which fact is probably rather a pity, as it increases the number of old "lungers."

Scab.—The Stock Inspectors are doing their utmost to grapple with this scourge, but it is very disheartening to see the quantities of scabby sheep introduced into the country under Martial Law.

Glanders.—Suspicions of this disease existing amongst the loot horses at Mooi River existed in the minds of many farmers in the Colony. I have made enquiries at the Remount Depôt, and the Veterinary Surgeon in charge assures me not a single case has been detected amongst the loot stock.

Pneumonia in an imported Devon cow, which recovered under the usual treatment.

Anæmia in an imported bull, the result of an attack of redwater.

Ophthalmia in calves.

Purpura Hæmorrhagica in an imported Hackney stallion.

Liver Degeneration in an imported Shetland pony ; the pony died.

Lacerated wound in a filly.

Vegetable poisoning in a cow.

IXOPO—D.V.S. VERNEY.

Scab.—Except for Alfred Division my Districts are fairly free from this disease.

Lungsickness.—There have been no fresh outbreaks of this disease.

Tetanus.—A case of tetanus occurred in the Polela District. The animal was a young cart mare running on the veld. There was no previous history, nor was there any evidence of any wound which is usually the case in animals developing lockjaw. The animal died.

A case of horsesickness in a thoroughbred pony in the Polela District came under my treatment. I am glad to say this animal made a good recovery.

NEWCASTLE—D.V.S. HUTCHINSON.

Lungsickness.—In the Newcastle Division forty-four herds have been placed under license during the month. The majority are cattle that have been taken from the Captured Stock Depôt at Newcastle. As I have pointed out in previous reports, all animals taken from the Imperial Government Depôts are immediately placed under license, as cases of the disease have, so far, appeared in every troop of captured stock brought from the Transvaal and Orange River Colony. Three outbreaks have occurred in the Upper Tugela, eight in Ladysmith, seven in Dundee, and three in Umsinga. The isolation camp on Dicker's farm, near Dundee, contains seventy-four cases, and the isolation camps at Lennoxton about 200.

Scab.—All sheep sold at the captured stock sales have also been placed under license. Besides these, the following outbreaks have been dealt with, viz. :—Umsinga one, Dundee five, Ladysmith one, Upper Tugela one, Newcastle ten.

Glanders.—One case destroyed.

Redwater is still very prevalent amongst cattle introduced from the new Colonies.

Horsesickness.—Losses from this disease have been very heavy all over my District during the last fortnight.

Actinomycosis Bovis.—My attention was called to a case near Dannhauser. This is the second I have met with in the Colony. The fungus was affecting the tongue in both instances. I do not think the disease is very prevalent in Natal, but understand cases are often met with in the Cape Colony. Stock-owners should understand that the majority of cases are amenable to treatment if taken in hand during the early stages of the disease.

Forest in War.

(By G. H. DAVIES, Forest Ranger, Qudeni.)

IN the *Journal* for January 19th, 1900, there was a report of a paper read by Mr. D. E. Hutchins before the Society of Arts, London. Reference was made in it to the military value of forest, followed by an argument tending to show the assistance likely to be given by forest to the inhabitants of an invaded country. I remember, years ago, an unfortunate public assertion of the opinion that Natal should be cleared of bush because it would give an advantage to mutinous kafirs. Thus we have an agreement reached from two opposite points of view as to the strategic value of forest.

Soon after the report above referred to appeared in the *Journal*, I was favoured by another expression of opinion, not in words this time, but in the convincing language of action. In February, 1900,

a force of Boers was drawn within a mile or two of the Qudeni forest by a party of scouts, persumably sent for the purpose. The enemy was in command of the district, postal communication was cut off, and a store but a couple of miles from the bush was looted. I was advised by the kafirs to hide in the forest, but did not think it worth while. The Boers showed a wholesome respect for the main bush, which could cover the movements of numbers of scouts, and be held against them by a handful. We who lived close to it were quite safe from molestation, while the nearness of the bush to the Intingwe road gave us a means of communication with Eshowe that the enemy could not prevent.

Let us suppose, however, that a forest was held by Boers in the path of a British column. Would the former have a great advantage, or would forest not deprive them of the very advantage which enables them to fight regular troops at all? The possession of cover while the soldiers are in the open seems a necessity of Boer warfare. This condition would only exist at the commencement of the attack upon the outskirts of the bush. Then would ensue a state of things that only regular discipline could cope with. Unable to see many yards in any direction, or to be sure of the position of friend or foe, amid the din of musketry and the cracking of branches, the Boer would realise that he might be outflanked before he knew it. Unless he retired very rapidly the disciplined soldiers — trained to act as a single machine — would have surrounded him and his. In fact, it is hard to imagine that Boers, or any other undrilled men, would attempt to hold forest at all after its cover had been gained by regular troops. However harassing hunting tactics may be, cohesion and subordination are required, as this war proves, to conquer a country or to hold one, and in forest, even to circumvent game, hunters are obliged to close up their ranks and adopt a more military style of attack than in the open. To fight soldiers they would have to abandon their isolated methods, and become soldiers themselves. Substitute kafirs for Boers, and the only difference in the result would probably be that the former, with savage stupidity, would cling to the illusive protection of cover, and be roped in and be killed or captured by regular troops.

The only conclusion we can come to, then, seems to be that, to hold the country for order and civilization, we should afforest it—that tree-planting is as civilising from the military point of view as it is from the economic. While, however, the military critic from Britain might concur in this, he might tell us that the afforestation of such a wilderness as is Natal, for instance, is too large an undertaking for practical consideration. In this he would be chiefly influenced by his knowledge of the slow growth of trees in England. Fresh from Europe, he could hardly realise that, in less than a decade, most of the barren surface which extends over the greater part of the Colony could be covered with dense plantations of wattle, and other rapid exotics, if the inducement to the land-owners was strong enough. Regular forest trees could be planted in succession if the permanency of the work was ensured by law, and I endeavoured in the issue of the *Journal* for the 16th March, 1900, to show that a scheme for the afforestation of Natal was quite practicable. Possibly a subsidy in money would have to be added, but even if that amounted to twenty per cent. upon the private funds spent in actual planting, such expenditure could be defended as absolutely necessary in the interest of the Colony as a whole. The military value of forest may be easily expressed by the statement that it favours discipline, but the civil value is more important still, Climatic amelioration, supply of timber and small wood, and the final subjection to control of the veld fires go to make it up. And there are other advantages as well.

The military aspect should, however, be carefully studied, as the result may be to dispel the time-honoured connection between forest and freebooter under modern conditions with long-range rifles.

Port Shepstone District.

INTERVIEW WITH MR. J. G. MAYDON.

By "ERGATES."

IT has long been a "far cry" to Port Shepstone. The journey was not one to be taken without consideration: the country from Durban was sparsely inhabited, the road was always up or down hill, and at short intervals soft and boggy, and the service by sea was intermittent, and perfectly irregular as to departure and arrival. These conditions are now on the eve of change, and in a couple of months the south coast railway, which now terminates at Umzumbi, will have reached its goal—Port Shepstone—some twelve miles ahead.

The country surrounding Port Shepstone is picturesque in the extreme. The hills, covered with thick forest bush or cane, though of soft contour, are extremely steep, and rising from each other's base leave practically no flat land. Even the river alluvial flats—superb for vegetable life—probably do not altogether exceed in quantity a thousand acres. Then the lover of the picturesque has from the sides of the hills a view of the ocean, and, according to his locality, of a section of the beautiful Umzimkulu River, which for half a dozen miles is as broad as the Thames at Putney.

There are three agricultural estates of importance in what is known as the Port Shepstone District: that of the Umzimkulu Sugar Company, the Ruthville, owned by Messrs. Aiken, and the Barrow Green Estates. At the manager's house of the last, Mr. J. G. Maydon, who is largely interested in the Barrow Green and Umzimkulu companies, was staying, and he was good enough to give me the local information I asked for.

"The Ruthville Estate," said Mr. Maydon, "is the oldest, and they are growing practically all Coast products upon it, including even tea, but their chief industry is sugar, their cane being now crushed at the central mill owned by the Umzimkulu Sugar Company. The "Barrow Green" originally grew coffee and tea principally. Shortly after the coffee leaf disease made its appearance, the Estate passed into the hands of the present proprietors, who increased the acreage in tea, and grew fruit in place of coffee. Of late, a considerable quantity of land has been put under sugarcane, and every year it is intended to extend this crop.

UMZIMKULU SUGAR COMPANY.

The Umzimkulu Sugar Co. is prospering, and in a short time will be one of the largest contributors to the sugar output of Natal. Mr. C. Gersigny, who is the Managing Director, and who was making one of his periodical inspections, was good enough to give me the following figures relating to the sugar produced at the mill:—

1898	212 tons	
1899	410 „	
1900	825 „	estimate
„	950 „	actual
1901	900 „	estimate
1902	1,800 „	„

The mill is modern, and first-class in every way. The centrifugals are Weston's patent, having all the latest improvements. The milling power requires increasing, and orders for £2,500 of extra plant have been sent Home. The site of the mill is on the south bank, about a mile above the ferry, and is admirable in every respect. The water carriage is, of course, the most striking advantage which the visitor notices as being possessed by the mill. The cheap handling of so bulky and heavy a product as cane is a big and constant problem for sugar growers, and that problem to a great extent is solved locally by the existence of the river-way. At various points along the river the cane within convenient distance is collected and loaded into boats which float up or down the river with the tide, or are towed by a steam launch, and pass into a canal which leads to the foot of the mill's cane-

elevator, which in turn conveys the cane to the crushing rollers. Another labour-saving agency and of the most simple character attracted my attention, namely, a wire rope from the summit of a high hill and anchored close to the mill. Down this rope travels the cane which grows in the neighbourhood of the starting place in slinged bundles. The slings, attached to iron pulleys, are returned on the pack-saddles of mules. When the railway station, which will be two or three miles down the river on the north bank, is opened the sugar will, of course, be delivered by boat.

Marburg.

"The Marburg settlers," said Mr. Maydon, "depended on water communication for disposing of their fruit. The communication was wholly unsatisfactory, and for some time the settlers have given up cultivating. Now, with the railway approaching, they are making another start."

Marble.

About the marble deposits which occur at the point where the Little Umzimkulu enters the big river, Mr. Maydon gave me some information which is not generally known. Having asked questions as to the quantity and value of the marble, he replied to the following effect :—

"It is always well to know what is outside opinion as to the value of a thing. Some five years ago an American syndicate acquired the great Vermont marble quarries of America and a commanding interest in the Carrara desposits of Italy, and having done so they raised the price some 20 to 30 per cent. Messrs. Brunton, the great marble dealers of England, asked for an abatement of the terms, but they were met with a point blank refusal. Messrs. Brunton, having heard of the Natal marble, thereupon sent what I may call a commission of three experts. The commissioners were thoroughly satisfied, and got an option for Messrs. Brunton over the quarries. The Vermont ring then immediately capitulated, and Messrs. Brunton, getting the terms they wanted, dropped further interest in the matter. One of the commissioners, however, was so impressed with the value of the deposits that he returned on his own account to Natal, and from Messrs. Adolph Goez, H. B. Marshall, Loveday, and others obtained sufficient capital to purchase the quarries from their owners, Messrs. Aiken. Thirty thousand pounds was the price, half of it being paid down on the conclusion of the transaction. This should show that solid business is meant, and that it is intended to handle a big tonnage. On account of the absence of transit facilities nothing is being done at present, but about the future there is no doubt whatever. One Rand group alone will want 4,000 tons of lime per month. The agricultural demand will also be considerable, for, as we all know, the soil of the Colony generally is very deficient in lime. I foresee—as soon as the facilties are provided — an export between marble and lime of fully 200,000 tons every year."

Land Lying Idle.

During the latter part of my railway journey, and more particularly while driving from Umzumbi, I was much struck by the unoccupied appearance of the country. Making reference to this subject, Mr. Maydon observed :—

"Much of the country in this quarter of the Colony belongs to the Native Trust, or to Mission Reserves, and a good deal is in the hands of absentees. A very large block of land, for instance, which comes up to the boundary line of this—the Barrow Green Estate—is owned by residents in England. Fifteen years ago it was valued at about 20s. per acre, and now it is well worth £6 per acre. The owners have done nothing in the way of beneficial occupation. The Indian gardens through which you passed were leased at 10s. per acre about a year ago. This locking up of land just to get the enhancement of value that the efforts of others may give it, is injurious to the common interests. A good deal of Government land has also been sold to Natives, and the laxity in enforcing the beneficial occupation regulations in the case of whites is impartially extended to the Natives."

Transit.

"Yes, the railway is expected to work wonders for the district, and justly too. Shipping communication has wholly ceased. A couple of years ago while it existed, the Barrow Green Estate received

an order from Durban for shipping £500 of fruit, good delivery, of course, being stipulated. Through delays the most of the fruit rotted, and not 3d. was netted by that order. Last year, when the railway terminated at Umtwalumi, the same Estate was able to sell £1,000 of produce that would otherwise have perished. With the railway at Umzumbi sugar can now be sent to Durban at 25s. per ton, the train charge being 14s. per ton. From one cause and another the railway has taken seven years in reaching here from Isipingo. This would be a good route for Griqualand East, one of the very finest agricultural and pastoral Districts in South Africa. It is hoped that a post cart will be run from here to Harding at an early date. Passengers would be able to reach that town in a day from Durban. Of course all are looking forward to the opening up of the Port as a real port available for fair-sized ocean-going craft. The engineering problem, I do not think, will be found a difficult one, and the services of a suitable dredger would in the meantime help greatly. I say suitable, for the dredger sent here a short time ago pumped direct overside her spoil where she had drawn it up. The spoil, of course, should be removed either by the dredger herself or by barges. The river requires dredging: it is navigable for seven or eight miles from the entrance, and is a valuable Colonial asset. The heavy machinery from the Umzimkulu Mill was taken by boat from Durban and landed at the river stage of the mill. What about the climate? Well, it is some 8 or 10 degrees cooler than the North Coast. The reason? The reason is simple. The coast current along here is fully so many degrees cooler than that running along the north shore. There the great hot current from the Indian Ocean, which comes down the Mozambique Channel, and then travels south, leaves the coast in the neighbourhood of Scottsburg, being diverted, I imagine, by the Aliwal Shoal, and the intervening water coming along this point of the coast is cooled by the great Antarctic current."

The drive back to Umzumbi I shall not soon forget. The rain poured down solidly the whole while, and the trap in parts sunk to within an inch or two of the axles. The last mile had to be done on foot. These late rains are a continuous source of delight to the sugar planters, for they ensure in many instances a big return at next year's crushing.

Correspondence.

To the Editor Agricultural Journal.

Castle Buildings, Durban,
Natal, S.A.

DEAR SIR, — Herewith we have pleasure in handing you translation of an article which recently appeared in an Australian publication regarding the effect of artificial manuring on wool.

We are unaware of the name of the author, but as we are interested in the sale of potash manures we shall be pleased if you will insert the gist of the article in the *Journal*, in order that we may learn the opinion of Natal agriculturalists on the subject.

We shall be interested to learn how far it bears on breeding in this Colony.—We are, etc., q.q. Wm. Cotts & Co., E. H. Brooke.

EFFECT OF ARTIFICIAL MANURING ON WOOL.

Translation of article from the "German-Australian Post."

"Agriculturalists have for no inconsiderable time past fully recognised the beneficial influence of artificial manure to their lands, and have attained much better results since having in this manner rendered a little assistance to nature. To a great many, however, it will not have occurred that in order to obtain the best results in connection with wool something similar must be resorted to. As is well known to all versed in such matters, a large percentage of potash is contained in the yolk of the wool, which is drawn from

the soil year in year out and sent away with the wool, hence here disappears one of the most fertilizing elements of the soil from the latter. A few figures will serve to demonstrate the point. In 1899 231,451,779lbs. of wool were exported; this was less than is usual in an ordinary season. From 1893 to 1899 the total export of wool amounted to 2,111,863,834 lbs. The amount of nitrogen was 380,135,484 lbs. contained in this wool, *i.e.*, as much as is contained in 1,697,000 tons of dried blood. The amount of potash thus exported amounted to 12,672,000 lbs., or as much as is contained in 45,265,000 tons kainit. This is an impure potash salt, containing about 25 per cent. sulphate of potash. Again, in 1899 there were 4,600,000 sheep slaughtered, and during the seven years from 1893 to 1899 a total of 46,088,677; the number of lambs slaughtered during the same periods to 192,000 and 1,009,187 respectively. The nitrogen thus extracted from the soil in this manner amounted to 56,507,616 lbs., which is equivalent to 252,363 tons of dried blood. The amount of phosphate of lime contained in these sheep and lambs was 70,634,514 lbs., equal to 70,073 tons medium bone meal.

"From these figures it will be seen how very considerable are the fertilizing properties of which the soil becomes deprived from year to year, and the question is whether this in time will not prove to have a deteriorating effect on the wool itself? Is it not advisable to enrich the soil by artifical means, and thus improve and increase the wool harvest? These are most important questions, which ought to be thoroughly investigated. That the potash finds its way into the yolk or sweaty part of the wool has been indisputably proved in the wool washing; in one place alone in Liverpool 50 tons were collected. The sweat of the wool is composed to a great extent of soluble potash salts, which are drawn from the soil, and which, after having passed through the blood, become united with various other animal acids. The sweat secretes through evaporation, leaving a certain residue bound to the skin by filaments, or forming into layers at the roots of the wool."

Another authority writes:— "The sweaty wool is found mostly round the breast and shoulders, just where the best and most healthy wool is to be got, and the quality of wool on other parts depends to a large degree upon the quantity of sweat. Should there be an insufficiency of sweat, the fibre of the wool is dry, hard and weak, and the whole fleece becomes thin and hairy, whereas with a sufficiency of sweat the wool is soft and oily, rich and strong.

"From this it is to be inferred that while the sweat has a beneficial influence on the wool, the potash is necessary to the sweat; further, where rearers observe an insufficiency of sweat with their sheep a remedy is to be found in a careful manuring of their lands. As to whether this theory would work out in practice must be left to practical tests and experiments to decide, but a solution of the question deserves the fullest consideration of rearers.

"A further question is that if the natural state of the land renders ten acres necessary for sheep, would it not be possible to so enrich the soil as to allow of these ten acres feeding ten sheep? Should this be the case, the manure question would be well worthy of consideration, the more so as the colonial laws are more favourable to smaller land concessions. The more valuable the land becomes, the more satisfactory results may be expected. Of course, the difficulty in answering above questions lies in the fact that up to the present no experiments have been carried out."

The "Farmers' Guide," published by the Australian Manures Co., Victoria Market, Sydney, writes:—"The grazing of the cows quickly exhausts the phosporic acid salts and potash, and it is very important that these properties should be again given back to the soil if it is desired to keep the meadows in good condition.

"A certain gentleman made very interesting experiments with cattle. He divided up a small meadow into two parts, manured the one half and left the other half in its natural state, when he let the

cattle on to the meadow. The cattle remained on the manured side and devoured everything, until there was almost nothing more left; they even then preferred to continue grazing away at whatever still remained, although there was considerably more food on the other side.

"As regards sheep and wool, however, the artificial manuring question still remains an open one, and we trust that a few of the leading rearers will consider fit to institute experiments and publish the results."

INSANGO.

Sir,—On several occasions I have had an opportunity of discussing the growth of the hemp plant commonly known as "Insango" (Cannabis Sativa), and the dealings therewith by several persons in this Colony, and its importation into the adjoining territories.

I have asked several influential gentlemen to represent to the Government the necessity of the passing of a Law similar to that of Mauritius, which should work in conjunction with that of Burr Weed (Xanthium Spinosum), Law 38, 1874.

Allow me to point out to you that this venomous plant is dangerous to the community using it, and it has often caused, and will cause, a great many crimes and misdeeds.

This unscientific (scientific by those using it), heathenish plant is spreading with frightful rapidity, attended by heartrending results through the Colony and elsewhere, and hundreds are being ruined physically and morally by this wild plant. In its swift, deadly course it is spreading devastation almost everywhere, and wrecking the minds and eating away the strength and wealth of hundreds of people using it.

If a restriction is made in its growth and sale, etc., it will cause a large increase to the revenue.

In Mauritius a license of high value is issued to the cultivators and dealers, and those who have not such licenses are prosecuted and fined up to Rs.500.

If more information is required about this wild plant, I am prepared to show how the licensed dealing therewith will benefit the prosperity of the Colony, and what a danger exists regarding its present use.

D. VINDEN.

Ladysmith.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc: 37, 1900. For the month of April, 1901.

DATE.	DESCRIPTION.	QUANTITY.	IMPORTED FROM.	SHIP.	REMARKS.
1901.					
April 8	Ipomea Oreeping Plant ...	1 Case	Mauritius	Wistow Hall	Free of Pest.
„ „	Seed Potatoes	258 Cases	Australia	Geo. Pyman	„ „
„ 22	Apples	100 „	„	Cam	Infested by Purple Scale. Fumigated.
„ „	Lilies of the Valley, &c. ...	2 „	England	Kinfauns Castle	Free of Pest.
„ „	Fruit Trees	3 „	France	„	„ „
„ „	Oranges	6 „	Messina	„	Infested by Mussel Scale. Fumigated.
„ „	Apples	103 „	Melbourne	Juanita North	Free of Pest.
„ „	Banana Plants	4 „	Mauritius	Gironde	„ „
„ 28	Bulbs	1 „	London	Kinfauns Castle	„ „
„ 30	Apples & Pears	1,837 „	Melbourne	Warrigal	„ „

C. B. JONES, Examining Officer, Durban.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inanda & Ndwedwe	Lungsickness	H. Gillespie ...	Avoca.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein.
		"	W. Ralfe ..	Ennersdale.
		Lungsickness	J. T. Howell ...	Doornkop.
		"	Joeisa ...	Klipfontein.
		"	Toonyani ...	Chieveley.
J. Button ...	Estcourt, South of Bushman's River	"	J. Mattison ...	Klipstone.
		Scab	C. P. F. Marais ...	Stockton.
		"	H. E. Kirby ...	Klipfontein.
		"	A. Lawrance ...	Grantly.
		"	W. S. Crart ...	Springvale.
		"	W. E. Oates ...	Oatsdale.
		"	W. Gillot ...	Gladstone.
		"	T. Robinson ...	Mount Pleasant.
		"	H. W. Smith ...	Molbetstone.
		"	S Shoemann ...	Twyfelfontein.
		"	H J. Hurd ...	Weston T'Lands
A. H. Ball ...	Weenen ...	"	C. P. F. Van Rooyen	Mona.
		"	G. R. Van Rooyen	Vitooria.
		"	R. J. J. Van Rooyen	Bird Spruit.
		"	"	Doornkloof.
		"	L. J. Lotter ...	Waterfall.
		Lungsickness	Jogozalah ..	Woodford.
		"	A. B. Bell ...	"
		"	Secwa... ...	Baviaan's Krantz.
J. J. Hodson ...	Lion's River ...	Scab	Jas. Morton ...	Tweedie Hall.
		"	H. Steadman ...	Woodlands.
		"	C. Strapp ...	Oatlands.
		"	G. Woodhouse ...	Halliwell.
		"	Jas. Ross ...	Gowrie.
		"	A S. Parkinson ...	Shafton Grange.
		"	D. McKenzie ...	Cotswold.
		Lungsickness	A. Clark & Natives	Mount Ashley.
E. J. B. Hosking ...	Upper Umkomanzi	"	H. Gillespie ...	Intimbankulu.
		"	Native ...	Stirtreimfontein.
		"	Turnbull & Co. ...	Glen Islay.
R. J. Raw ...	Impendhle ...	Scab	H. J. Martens ...	Wuthering Heights.
		"	G. Q. Hamilton ...	Ivanhoe.
		"	J. W. Brooke ...	Impendhle Store.
		"	D. Tootell ...	Kimberley.
W. Wilson ...	Polela.	Lungsickness	H. Eaglestone ...	Coleford and The Bungalow.
C. E. Hancock ...	Ixopo ...	"	J. H. Johnson and Natives	Dronk Vlei.
		Scab	Native Pietman ...	Wesley.
		"	H. W. Chick ...	New Garrett.
		"	C. Green ...	Gorton.
		"	C. L. Hammond ...	Sunrise.
		"	W. K. Anderson...	Maxwell.
		"	J. Anderson ...	Lilliedale.
		"	E. S. Clarke ...	Carr End.
		"	Malambula ...	Location.
		"	Budoza ...	Hlogozi.
		"	Qinisani ...	Klipgat.
		"	Solibamba ...	Lutafa.
		"	R. Kennedy ...	Cornhill.
		"	G Thomson ...	Cromwell.
		"	A. Watson ...	Rosehill.
		"	Archibald & Co. ...	High Flats.
A. J. Marshall .. (Acting)	Newcastle	Lungsickness	A. A. Osborn ...	The Mount.
		"	Native Shallos ..	River View, Ingogo.
		"	H. P. Beare ...	Glen Hesit, Ingogo.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ... (Acting)	Newcastle ...	Lungsickness	G. L. Fraser ...	Ingogo.
		"	J. F. Grant ...	Hilldrop.
		"	H. S. Dicks & Sons	The Retreat
		"	Native Funwayo...	Tigerkloof.
		"	Umbobo & Lugudu	The Gardens.
		"	Umgodini ...	J. Adendorff's farm Ingagane.
		"	Kotshaindoda ...	N. Dugenaar's farm, Ingagane.
		"	J. W. O'Reilly, Natives Jonas, and Paplana	Newcastle T'Lands.
		"	L. H. S. Jones ...	"
		"	J. Hodgson ...	Belvedere.
		"	Bob. Salugwanda	Boschhoek.
		"	A. Nottman ...	"
		"	P L. Uys ...	Jackalspan.
		"	T. Breary ...	Newcastle Colliery.
			J. Davidson ...	Lennoxton.
		"	A. Danks & Fox...	Crown Colliery. Newcastle.
		"	Beckeroo ...	Lennoxton.
		"	J. Smith ...	"
		"	— Sheikamier ...	Newcastle.
		"	J. J. Exsteen ...	Manning.
		"	A. Paine ...	Mount Prospect
		"	F. W. Hatley ...	"
		"	E. Parker ...	"
		"	Ramsaroop ...	Newcastle.
		"	G. J. Way	Vrede.
		"	Unjopal & Eseresing	Newcastle.
		"	A. H Tatham ...	"
		"	J. W. James ...	"
		"	G. Brown ...	Wykom.
		"	Macdonald & Kemp	Lennoxton.
		"	Natives ...	Whykombe.
		"	" ...	Droog Plaats.
		"	J. Pettigrew ...	Newcastle T'Lands.
		"	A. Krause ...	Filexton.
		"	G. W. Nourse ...	Rutti & Highton.
		"	Simeon Ndhlovu	Freda.
		"	— Hodgson ...	Newcastle T'Lands
		"	S. W. Reynolds ...	"
		"	O. Olver ...	"
		"	D. S. Redman ...	Snipe Marsh.
		"	R. T. H. Harrison	Lennoxtown.
		"	F. Ferrier ...	Henley Farm.
		"	G. W. White .	Ruth.
		"	C. R. Savory ...	Pomeroy and Evin.
		"	Dr. Ormond ..	Ingogo.
		"	Seikomya Datuz	Newcastle T'Lands.
		"	Loxton & Rudd	Waterfall.
		"	L. C. Koch ...	Kabbaslaagte.
		"	D. Miller ...	Roseless
		"	H. Singleton ...	"
		"	E. Graham ...	"
		"	Cooper & Chandley	Newcastle T'Lands.
		"	Blizzard & Pratt	Ingogo.
		"	J. W A. Welsh...	Paradise.
		"	— Hanstin ...	Wykom.
		"	J. G. Kemp ...	Heighton.
		"	G. Star ...	Lennoxton.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner	Farm.
A. J. Marshall ... (Acting);	Newcastle ...	Lungsic ness	G. Wood ...	Heron's Court.
		"	W. L. Lea ...	Lennoxton.
		"	J. Mortimer ...	Try Again.
		"	P. W. Dept. ...	Newcastle T'Lands
		"	S. Loxton ...	Lennoxton.
		"	D. Dewar ...	Newcastle T'Lands.
		"	W. A. Ross ...	"
		"	Nehorasing ...	"
		"	— Roberts ...	"
		"	C. Watson ...	River Bend.
		"	H. James ...	Kalbaslaagte.
		"	J. R. Watt ...	Horn River.
		"	G. Matthews ...	Shakespeare.
		"	H. Loxton ...	Lennoxton
		"	A. & S. J. James...	Paradise.
		"	Natives ...	Hope Farm.
		,	— Flemming ...	Newcastle T' Lands.
		"	Vinnecombe &	Lennoxton.
		"	Robson ...	
		"	W. R. Bowes ...	Endsell.
		"	F. Watson ...	Greenwich and
		"		Mountain View.
		"	G. E. Jubber ...	Brackfontein.
		"	Digeto ...	Rooi Point.
		"	J. E. Caef ...	Chelmsford.
		"	C. de Wet ...	Schuinshoogte.
		Scab	H. S. Dicks ...	Lennoxton.
		"	A. J. Middleton ...	Ingogo.
		"	W. E. Few ...	"
		"	F. Johnstone ...	Craig.
		"	Umkwenesi ...	Alcock's Spruit.
		"	J. Dicks ...	Vet Klip.
		"	F. R. Tewson ...	Rooi Point.
		"	W. A. Lang ...	La Belle Esperance.
		"	J. Vanderwesthuise	Hartebeestelaagte.
		"	W. C. F. Napier ...	Eagles Cliff.
		"	J. A. Vanderplank	"
		"	A. P. de Jager ...	One Tree Hill.
		"	G. J. Way ...	Vrede.
		"	J. W. O'Reilly ...	Gordon.
		"	H. P. Beare ...	Ingogo.
		"	J. Matthews ...	Shakespeare.
		"	O Schwikkard ...	Boscabelli.
		"	G. Star ...	Lennoxton.
		"	R. S. Miller ...	Goloch.
		"	W. C. F. Napier...	Newcastle T'Lands.
		"	C. G. Palmer ...	Dry Cut.
		"	P. L. Uys ...	Jackalspan.
		"	W. Dicks ...	Hope Vale.
		"	S. J. James ...	Stafford.
		"	J. W. Shuttleworth	Duck Ponds.
		"	S. W. Reynolds .	Newcastle T'Lands.
		"	W. L Jee ...	Lennoxton.
		"	J. Davidson ...	"
		"	A. J. Debenham...	Knowsley.
		"	E. Bentley ...	York.
A. S. Parkinson ...	New Hanover	Lungsickness	T. Dawson ...	Zwartkop.
A. Hair	Umgeni and Borough of Pietermaritzburg	"	C. Oldfield ...	Wilgefontein.
		"	H. H. S. Moreland	Maudstene.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River	Lungsickness	Discharged Transport Cattle	Matowan's Kop.
		,,	W. J. Tully ...	Grobelar's Kloof.
		,,	A. H. Spring ...	Reserve.
		,,	W. Cochrane ...	Aller Park.
		,,	A. Armstrong ...	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ...	Grobblar's Kloof.
		,,	Natives ...	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,,	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	J. A. de Waal ...	Blau Bank.
		,,	J. P. Buys ...	Reit Kuil
		,,	Pepworth & Reid	Reitfontein
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein
		,,	Natives ...	Weltervreden
		,,	J. Peniston ...	Reserve
		,,	W. M. Tollner ...	Weltervreden
		,,	J. Van Whye ...	Ladysmith T'Lands
		,,	G. J. Heslop ...	,,
		,,	H. E. K. Anderson	Gedula.
		,,	J. F. Rethman ...	Georgina.
		,,	Natives ...	Reit Kuil.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	G. F. & J. Woodhouse	Davel's Hoek.
		,,	Natives ...	Georgina.
		,,	,, ...	Zwaart Kloof.
		,,	G. J. McDuling ...	Waterford.
		Scab	J. H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson ...	Walker's Hoek.
		,,	C. Crawley ...	Waterloo.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	G. M. Rudolph ...	Reit Kuil.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	J. G. Nel	Femie's Kraal.
		,,	G. Wetherill ...	Walker's Hoek.
		,,	C. B. Lloyd ...	Klip Poort.
		,,	A. C. Beyers ...	Vaal Krantz.
		,,	A. Krogman ...	Brakfontein.
		,,	M. W. Krogman...	Dreifontein.
		,,	P. Marais ...	,,
		,,	H. Boers ...	Dew Drop.
		,,	G. Spearman ...	Feir View.
		,,	A. C. Harding ...	Waterford.
J. A. Morrison ...	Durban & Umlazi	,,	J. Van Reenen ...	Wessel's Nek.
W. Freer ...	Upper Tugela ...	Lungsickness	— Spence ...	Reunion Estate.
		,,	H. F. Pearson ...	Everton.
		,,	J. W. Coventry ...	Rangeworthy.
		,,	D. Munger ...	Bedale.
		,,	Mr. and Mrs. C. C. J. Bester	Bester's Hoek.
		,,	W. Freer ...	Acton Homes.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
W. Freer ...	Upper Tugela ...	Lungsickness	H. H. Reed ..	Mains.
		,,	W. O. Coventry ...	Acton Homes.
		,,	H. Francis ...	Bedale.
		,,	G. Spearman ...	,,
		,,	G. H. H. Coventry and Native	Rangeworthy.
		,,	G Spearman ...	Spion Kop.
		,,	F. Zunkel ...	Klein Waterfall.
		,,	T. H. Creevin ...	,,
		,,	Dr. Jones ...	,,
		,,	D. G. Giles ...	Upper Tugela Magistracy.
		,,	J. Reed ...	Roode Bent.
		Scab	J. Scheepers ...	Sand Drift.
		,,	C. Crawley ...	Waterloo
		,,	G. H. H. Coventry	Rangeworthy.
G. Gieblink ...	Zululand ...	Lungsickness	M. Titlestad ...	Ntingwe.
		,,	Dinizulu ...	Hlabisa District.
		,,	Noiwana ..	Nqutu.
		,,	Natives' Cattle ...	Melmoth.
		,,	Sebambindoda ...	Kwamagwaza.
		,,	G. Havemann ...	Insuzi.
		,,	Military Loct Cattle	Warbeck, Elizabeth, and Barneveld Melmoth.
		,,	Damusa ...	near Melmoth.
		,,	Ndabazeywana ...	Nqutu.
		,,	Strachan ...	,,
		,,	Jacob ..	Vant's Drift.
		Scab.	H. T. James ...	Prospect.
A. Klingenberg ...	Umsinga ...	Lungsickness	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
		,,	Combrink Bros. ...	Uithoek.
		,,	Mrs. H. Strydom...	,,
		,,	Ngobazane	Vermaak's Kraal.
		,,	Usiquantjee ...	Emsita.
		,,	James Fuli ...	Umsinga Location.
		,,	A. Müller ...	Pression.
		,,	Marshall Bros. ...	Cleveland.
R. Marshall ..	Dundee ...	,,	— Dammann ...	Celle.
		,,	— Frockling ...	Henning.
		,,	W. Muller and C. Hellberg	Karlsburse.
		,,	— Schroeder ...	Schroeder's Hope.
		,,	do. ...	Rosenen.
		,,	— Haynes ...	Sterkstroom.
		,,	Military Authorities	Maypole.
		,,	A. F. Henderson...	Brazil.
		,,	— Stoffel ...	,,
		,,	— Ohlsen ...	Craigside.
		,,	Umquayo ...	Sweet Home.
		,,	Glutz ...	Rocky Glen.
		,,	Thorn ...	,,
		,,	D. Oppermann ...	Gedull No. 2.
		,,	— Botha ...	Jackalsfontein.
		,,	Cooper & Umbleby	Dundee.
		,,	Redman ...	,,
		,,	Natives ...	Craigieburn.
		,,	Cooper & Umbleby	Domain.
		,,	A. A. Smith ...	Dundee.
		,,	Redman & Nourse	Craigside.
		,,	J. Landman ...	Boschfontein.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
R. Marshall ...	Dundee ...	Scab	—Hearn ...	Hatting Spruit.
		"	J. W. Marshall ...	East Lynn.
		"	— Ohlsen ...	East Lynn.
		"	D. Meumann ...	Dundee.
		"	A. & P. Conyers ...	Rest.
W. A. Hutchinson	Alfred ...	"	Natives Sheep' ...	Maypole.
		"	G. Whitelaw ...	Deemount.
		"	W. Stafford ...	Sutherland.
		"	Nqubu ...	Location.
		"	Ngihla ...	St. Mary's.
		"	Mpapu ...	Location.
		"	Camulana ...	"
		"	Manxolo ...	"
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	Faku ...	Mount Alice.
		"	A. C. Beyers & Sons	Doveton.
		"	A. P. Vandermerwe	Poortje.
		Scab	H. L. Francis ...	Rietfontein.
E. Varty ...	Umvoti—Western Portion	"	J. Lawford ...	Emmadale.
		"	L. M. J. Nel ...	Schikhoek.
		"	Bros. P. R. & G. H. Nel	Wonderboom.
		"	W. Slatter ...	Holme Lacy.
		"	H. Hansmeyer ...	On Rust.
B. C. Shooter ...	Alexandra ...	Lungsickness	H. Reynolds ...	Inyangweni.
		"	Umjanise ...	Pasture.
G. N. Perfect ...	Umvoti—Eastern Portion	Scab	L. J. Nel ...	Welgegund.
		"	J. A. Nel ...	"

The whole of that portion of the Colony north of the Tugela River has been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
8th May, 1901.

M. J. HIME,
for P. V. Surgeon.

"Paspalum Dilatatum."

THE following article in the N.S.W. "Agricultural Gazette," by Mr. P. Quirk, manager, Berry Stud Farm, New South Wales, deals with the advantages to be derived from the cultivation of *Paspalum dilatatum* :—

Now that the enormous extension of the dairying industry has made the sowing of artificial pastures so important a matter, and as the season for laying down permanent pastures is upon us, the subject is one that is discussed largely by the farmers, and information sought after. In travelling through the South Coast, one cannot help being struck very forcibly by the invariable remark by old residents and practical dairyman—"Our lands will not hold artificial grasses as they did years ago." The remark is only too true. Where at one time might be seen waving fields of rye-grass, cocksfoot, and clovers, are now growing the unsightly and undesirable tussocks, and the low-lying fields are covered in many cases with what is commonly called water-couch or swamp-grass.

This is a bad state of affairs, and again only too apparent in such an important dairying district. The farmers are realising it from a financial standpoint; so we are looking around us for a new move. We have been told our lands require manuring. This is very well in theory, but will not suit the pockets of small farmers, who could not afford to use artificial manures on (say) from 100 to 150 acres—a big item. Now I really think the salvation of the South Coast dairying industry lies in new grasses suitable to our lands, and believe the foremost of these are *Paspalum dilatatum*, one of the most valuable grasses ever introduced into Australia, which is the

most prized grass on the northern rivers; but it is unfortunately a difficult one to raise from seed. It requires at least three weeks of warm, moist weather to germinate, but when you get *Paspalum dilatatum* you have it for all time. It shows up enormous quantities of feed during the hottest and driest weather; and now that our farmers freely admit rye-grass will die out after a few years, I strongly advise sowing a mixture of *Paspalum* with other seeds—say, about 1 to 1½ lb. per acre. The following should be a good mixture:—Rye-grass, perennial, 15 lb.; cocksfoot, 15 lb.; mixed English grasses, 2 lb.; Kentucky blue-grass, 3 lb.; clovers, mixed, 3 lb.; *Paspalum*, 1 to 1½ lb. This will make a good bottom for the first two years. After the rye-grass will start to die out in many places, the second year the fields should be allowed to seed if possible, so that the *Paspalum* will have an opportunity to distribute its seed, which is very light; in fact, it is blown a short distance by the wind and carried about by the stock and trampled into our loose soil. This is one of the main reasons why I advocate a small sowing to allow Nature to do its own work after the first sowing. This would not meet with the same results in hard clay lands where the surface soil is very hard, as found in many districts. By this method the farmer would have a field of *Paspalum* coming on when the other grasses are dying out.

Mr. O'Callaghan, Dairy Expert, procured from the Hawkesbury Agricultural College 200 roots of *Paspalum* and had them forwarded on to me at Stud Farm, Berry. They were planted on 5th October, 1900. The result is, the grass has grown 4 feet high, through a very unfavourable time; and as I wished to give them a severe test they were planted in light poor soil, which was too poor to grow broadcast maize planted alongside of it about the same time. Now, after five months' growth, the *Paspalum* is much higher than the maize, while the latter, at time of writing, is withered up on account of the dry weather, and all grasses also, except the *Paspalum*, which is green and flourishing, and the growth astounding. It was sown in drills 5 feet apart; it is now in seed, which will be harvested by cutting the heads off and the roots taken up and transplanted elsewhere. The seed is very hard to harvest, as it ripens irregularly and much of it sheds, which, when tramped into our loose soil by the stock, will germinate, as this is the best seed; and, in my opinion, why so small a percentage of it germinates is that the best seeds are left behind on the farm on which it was grown; hence it is hard to get good seeds on the market. The most reliable course to adopt for best results is by planting the roots. One root or bunch will make several settings, which can be obtained from many of the Government farms. In laying down a field with other grasses it would be a good idea to procure the roots and plant them, say, 6 feet apart both ways immediately after the grass has been sown; if allowed to seed the following year they would distribute, in Nature's way, a great amount of seeds. Drills need not be drawn; roots could be planted with the hoe after the style of maize. Spring is the better time for planting the seeds, but out of season for sowing other grasses; and I have planted *Paspalum* seeds in March, last year, and had the satisfaction of it germinating; and in this district I would favour March sowing, as weeds do not grow so abundantly.

To point out the wisdom of sowing *Paspalum* with other grasses, I have conversed on the subject with many leading and enterprising dairy-farmers, and pointed out to them the advantages, with the result that they at once saw the advantage and purchased *Paspalum dilatatum* seed to sow with grasses they had ready to lay down in permanent pastures. Again, many visitors that call upon us at the Stud Farm with a view to inspecting the imported stock, are struck with the wonderful growth of the *Paspalum*, and always make the request to be allowed a handful of seeds for trial sowing on their own farms. This speaks volumes for it, and only requires to be brought before their notice and in a few short years we will see the now unsightly tussocks and swamp-grass ousted and our fields again waving with a permanent grass.

The Production of Exportable Oranges.

IN a lecture on "Orange Culture and Diseases," delivered at a meeting of the Malta Archeological and Scientific Society, Dr. J. Borg, M.A., M.D., made the following remarks concerning the production of oranges best adapted for export purposes :—

"Too sandy and too compact soils are alike unsuitable for the regular growth of the orange tree. This tree, when planted in a sandy soil, is very liable to suffer from dry weather. A sandy soil is, generally speaking, a poor soil, because the nutritive compounds on which the tree subsists are very readily carried away by rain water, beyond the reach of the roots of the orange tree, which, it must be remembered, is essentially a surface feeder. A too compact soil keeps the water stagnant, and is one of the chief causes of chlorosis. Moreover, the roots are compelled to remain very near the surface, and therefore must be exposed to great heat in summer and to great cold in winter. Also, in a compact clayish soil the root system is particularly subject to dry rot. With regard to the chemical composition of the soil, we may say that the orange tree requires a soil containing a high percentage of carbonate of lime and oxide of iron, and only a moderate quantity of clay (alumina). When the percentage of clay is very high, or when the orange tree is situated on a subsoil of clay, it produces fruit having a very thin rind, and a very luscious flavour, but, unfortunately, easily subject to rot, and cannot be much depended upon for exportation. This is the case of some orange groves at the Boschetto. When the subsoil consists of soft porous rock, the fruit is large, has a thick rind, the oil glands and the aromatic properties are well developed. This may be observed in the orange groves of Casal Lia, Casal Balzan, and Casal Attard, Malta. If the subsoil is very hard and compact, and therefore very dry, as the subsoil of the orange groves at Musta, the fruit is small-sized, the rind is thin, but the pulp is very juicy and delicious. Fruit grown on such a subsoil ripens early, and is in every way suitable for exportation. Whatever the quality of the soil may be, still we may grow the orange tree to advantage, provided that the soil is so regulated that there will be a perfect drainage. A layer about two feet in thickness, and consisting of rubble and stones, and covered by two or three inches of thin rubbish, will constitute by itself a perfect system of drainage to favour the flow of superfluous water in winter. The layer of earth which covers that of rubble should be two feet in depth, and never less than one foot and a half. As the rootlets will hardly ever penetrate beyond the layer of rubbish, and as drought prevents the formation of roots within six inches from the surface, we may say that the soil in which the orange tree thrives is from twelve to eighteen inches in thickness."

Concerning manures, Dr. Borg said :—"The orange tree does not exhaust the soil very rapidly. The produce of the orange tree are the fruit and the pruned branches, so that, strictly speaking, the soil is depauperated of its nutritive substances for the same amount which these substances enter into the composition of the fruit and the pruned branches. If the nutritive elements of the pruned branches are again returned to the soil in the form of wood ashes, we will find that, even after the lapse of several years, the orange grove can hardly be said to be improvished at all. In the raising of crops of cereals and other annual vegetables we meet with the reverse. In these crops we carry off both the fruit and the plant which produced it, or in other words the earth loses for ever all the nutritive substances absorbed by the action of the roots. Now, the vast percentage of the weight of an orange consists of water and hydrocarbons, and of a few nitrogen compounds which the tree receives directly from the air. The small amount of phosphates and potash necessary for the formation of the fruit and the perfection of the orange pips is compensated by the stable manure which is supplied to the orange grove at regular intervals of six or eight years. The effect

of a too liberal supply of stable manure on the orange grove is the production of exuberant foliage and large fruit with a thick peel. The fruit loses much of its aroma and becomes fibrous. On the contrary a soil very poor in nitrogen compounds produces tiny oranges delicious in flavour but unfit for commerce. The chemical manures which preferably should be supplied to the orange grove are the assimilable salts of phosphorus and potash. Already we see that the more experienced foreign cultivators are abandoning the use of nitrate of soda and have taken to use the superphosphates and "sulphate" of potasium in moderate quantities. To this chemical manure I prefer bone-dust and wood ashes, which are cheaper, less active, and have a more durable influence on the soil. Stable manure, particularly cow-manure, is an excellent compost for the orange grove, provided it is sufficiently rotten to prevent any undue fermentation when supplied to the soil. But as it contains a high percentage of nitrogen compounds, a liberal supply should be avoided to prevent the deterioration of the fruit."

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of April, 1901 :—

Name of Colliery.	Labour Employed. Above Ground. E.	N.	I.	Below Ground. E.	N.	I.	Coal raised. tons.	cwt.
Natal Navigation	*13	82	96	9	290	77	9,099	2
Natal Marine	10	125	20	8	349	3	8,072	16
Dundee	14	28	101	10	174	254	7,865	3
Elands Laagte	11	17	105	9	110	215	5,486	12
St. George's	11	145	15	7	200	0	4,452	0
Natal Steam Coal	9	85	17	3	214	11	3,512	0
Newcastle	4	9	12	3	100	0	1,132	0
New Campbell	6	62	18	6	128	22	977	0
Inkunzi	2	10	0	1	45	0	606	4
East Lennoxton	1	0	8	1	0	20	307	0
West Lennoxton	2	1	7	1	7	15	208	0
Crown	No Return.							
Total	83	564	399	58	1,617	617	41,718	3
Corresponding month (1900)	11	10	95	7	75	200	5,519	16

*4 Europeans, 33 Natives, and 23 Indians, reported as employed in shaft sinking and other unproductive work, are not included in the return.

Mines Office,
May 8th, 1901.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of April, 1901 :—

	tons.	cwt.	tons.	cwt.
*Coal Bunkered	...	...	25,453	18
Coal exported to Cape Colony	5,972	5		
Beira	88	2	6,060	7
Total bunkered and exported ...	...	...	31,514	5

*Included in this item are 4,689 tons of Imported Coal.

Customs House, Port Natal,
30th April, 1901.

GEO. MAYSTON,
Collector of Customs.

The Model Dairy, Durban.

FIRST IN SOUTH AFRICA.

ON Thursday, 2nd of May, the Model Dairy, Durban, was opened. The site of the Dairy, being in West Street, opposite to the palatial store of Messrs. Harvey, Greenacre & Co., is excellent, and there can be little doubt that all the Durban townspeople in a very short time will know where to order supplies of the best Colonial milk, butter, and eggs.

The Dairy has been fitted throughout on the latest principles of the Model Dairies of England. It is not only the first in Natal, but the first in South Africa. The front part of the building is the shop at which retail trade will be done, and where orders for regular supplies will be taken. The shop, excellently lighted by large windows, is roomy, and is provided with small marble tables. Here fresh, rich, country milk will be served by the glass; other refreshments, of the character supplied in the Home Model Dairies, will also be procurable. On the day of opening there was on sale the following :—Milk, butter, eggs, "Coulommier," or new-milk cheese, Gervais, or Continental cream cheese, ice creams, milk-shake, egg-and-milk, and shortly will be added cream, junket, Devonshire cream, etc. The milk for the present is being sold at 4d. per pint, and the butter at 2s. 6d. per lb. The floor is tiled, and the walls and ceiling are covered with ornamental steel plating, flat painted in cool tints. Palms and ferns, dispersed through the shop, add still further to the general cool and artistic effect. The counter is of marble, and the base of polished teak. On the counter are three large "show refrigerators." These refrigerators, except at the corners, are wholly constructed of plate-glass, and are intended for showing off butter, etc., to good effect. A block of ice in the top compartment keeps the contents cool, almost to freezing. Behind the shop is the insulated storage. The system of chilling is the "direct expansion," which was fully explained in the article on the Transvaal Cold Storage at Cato's Creek. The motive power is a 5-h.p. oil engine. Here also is the chamber where the ice required for the business is manufactured, and close by is a room with hot and cold water laid on, and fitted with racks, etc., where the cans are washed. Milk will be sent to all parts of the town in insulated cans, the delivery being done by light vans and milk perambulators. The delivery vans are fitted with insulated boxes with compartments for ice, and the butter will be sent in these boxes, thus reaching the customers in prime condition in the warmest weather.

The delivery cans were specially constructed for the Company from designs supplied by the Nel's Rust Dairy, which first introduced this pattern of can. Mr. N. Harper, of Malvern, planned and imported all the machinery, and superintended the erection of the machinery, insulated chambers, etc.

The advance in the system of delivering fresh milk being inaugurated by the Model Dairy Company is remarkable. Until now townspeople, for the most part, have had to be content with milk of whatever good or bad origin, carried in bottles, slung round the body of a kafir, and fully exposed to the rays of our sub-tropical sun. The cleanliness of the bottles was often questionable, and that the broken corks were the homes of thousands of germs was certain. From this stage the jump is a big one to that of the Model Dairy Company. The Company will deal only in genuine Colonial milk which has been pasteurised, and will handle it until the moment for delivering on the most modern and approved scientific principles.

The fact, with regard to the establishment of the Durban Model Dairy, deserves placing on record here, that the conception of the idea and the elaborate carrying of that idea into effect, as described, is due to the enterprise of Mr. J. Baynes, M.L.A., the owner of the Nel's Rust Dairy, the first of the creamery class of dairies started in Natal. The general superintendence of the arrangements was in the hands of Mr. Geo. D. Alexander. All assistance pos-

sible was rendered by Mr. Challis, the Government Dairy Expert.

The Model Dairy Company will reeeive the support of the Nel's Rust Dairy, and Natal Creamery, Limited. These Companies have combined to supply the Model Dairy Company with dairy produee, and have appointed the Company their sole agent in Durban. Owing to the continued delays in obtaining the machinery, which rendered the opening of the Dairy uneertain, the Creameries had difficulty in arranging supply contraets with farmers. Tnis may limit the business of the Dairy for a short time, but it is confidently expeeted that ample supplies will be forthcoming in the eourse of a few weeks.

Sale of Derelict Stock.

RELEASE OF THE CURATOR BONIS

AT the Supreme Court on the 30th ulto., before Mr. Justiee Finnemore, sitting in Chambers, an applieation was made by the Attorney-General (Hon. H. Bale, K.C.), for an order eonfirming the Master's report on the aeeounts filed by the enrator bonis appointed by the Court to deal with derelict stoek, and also releasing Mr. C. B. Lloyd from the offiee of curator bonis, in view of the fact that he was relinquishing the offiee of Commissioner of Agrieulture. The aeeounts filed showed that up to December 31st, 1900, the revenue amounted to £47,396 17s. 4d., and the expenses of the enrator were £4,737 5s. A sum of £1,620 10s. 4d. had been lodged in the Treasury, and £36,000 deposited with the Master.

The Attorney-General, in support of the applieation, remarked that the aeeounts had been framed in a most satisfaetory manner, and in regard to the nature of the duties whieh Mr. Lloyd had been called upon to diseharge, the expense had not been exeessive. The amount paid into the hands of the Master was a very large sum. The work remaining to be done was not heavy, and he asked that an order might be granted eonfirming the aeeounts up to Deeember 31st, 1900, and allowing Mr. Lloyd to retire from the offiee subjeet to aeeounts being filed to date. It would be neeessary to appoint some fit and proper person in his plaee, although it was anticipated that there would not be very much more to do ; the last sale of stock taking plaee that day.

Mr. Justiee Finnemore : Was it not intended that he should be eurator bonis subject to his holding the offiee of Commissioner of Agriculture ?

The Attorney-General : Yes, my lord ; but he is relinquishing that offiee.

His lordship : And there is no sueeessor ?

The Attorney-General : No, my lord.

Mr. Justiee Finnemore remarked that the enrator had discharged his duties efficiently and eeonomieally, but, as he was retiring from the offiee of Commissioner of Agrieulture, it was reasonable that he should be allowed to relinqush his offiee as curator bonis. As no one was appointed Commissioner of Agrieulture in his plaee, it would devolve on the Master to appoint a fit and proper person to aet. His lordship eonfirmed the accounts, released the eurator from his office, subjeet to any moneys in his hands being paid over to the Master, and authorised the Master to appoint some fit and proper person in plaee of Mr. Lloyd.—"Witness."

Imports of Butter, Margarine, and Cheese.

IN reply to a request of the Commissioner of Agrieulture for information as to the imports of butter, margarine, and eheese, the Collector of Customs (Mr. George Mayston) supplies the following statement :—

	Quan'ity.	Value.	Quantity.	Value.
	Lbs.	£	Lbs.	£
Butter ...	1,609,177	67,684	2,253,829	105,136
Margarine	136,870	2,941	265,868	5,562
Cheese ...	899,923	22,245	1,120,931	30,525

Garden Notes for May.

By W. J. Bell, Florist and Seedsman.

KITCHEN GARDEN.—Where water is available small sowings can still be made of Radish, Turnip, Beet, Carrot, Parsnip, Lettuce, Parsley, Thyme, Sage, Marjoram, and other pot herbs.

Peas may be sown towards the end of the month for early spring cropping, where the frost is not too severe.

Earth up Celery and Broad Beans. The tops of the latter should be pinched off so soon as the lower pods begin to set.

Late planted Cabbage and Cauliflower will be much benefited by abundant watering and occasional applications of liquid manure at the roots. In the case of Cauliflower planted late it is a very good plan to plant them in trenches, with a good layer of rotten dung underneath; the same as for Celery.

Flower Garden. — Many varieties of hardy annuals and perennials should be sown now for winter and spring flowering, such as Larkspur, Candytuft, Petunia, Phlox Drummondii, Sweet Alyssum, Primrose, Polyanthus, Cowslip, Poppy, Salpiglossis, Stocks, Calendulas, Gaillardia, Sweet William, Pansy, Daisy, Carnation, Dianthus, Pentstemon, Mignonette, Cornflower, Antirrhinum. In the colder districts of the Colony, where night frosts are severe, spring would be the best time for sowing these, except where very sheltered places can be found, when a trial of some of the hardiest varieties might be made if they can be watered regularly.

The most hardy are Sweet Alyssum, Candytuft, Petunia, Calendula, Nicotiana affinis, Daisy, Cowslip, Primrose, Polyanthus and Pansy. The last four should be sown in boxes and transplanted. Watering in the winter should always be done in the morning, and never later than mid-day.

May and June are the two best months for sowing tree seeds such as the various varieties of Pines and Cypresses, Cedars, Casuarinas, Eucalpyti, etc. The following is a good selection of coniferous trees suitable for South Africa :—Pinus Insignis, P. Canariensis, P. Pinaster, P. Halapensis, Cupressus Sempervirens, varieties horizontalis and pyramidalis, C. Macrocarpa, C. Lusitanica, C. Goveniana, C. McNabiana, C. Funebris, C. Knightiana, Cryptomeria Japonica (Japan Cedar), Juniperus Bermudiana (Bermuda Cedar), Juniperus Virginiana (Virginia Cedar), Cedrus Deodara (Indian Cedar), Casuarina Quadrivalvis, C. Stricta, C. Tennissima, Thuja, Orientalis.

Where only a small quantity of seeds are being sown, shallow boxes should be used. See that they are well drained by having holes at the bottom, and a layer of broken brick or stone before putting in sandy soil. Fill the boxes within a few inches of the top with light, rich sandy soil. Sow the various sorts of Pinus about a quarter of an inch apart, and cover with half an inch of soil. Small seeds, such as Cupresses, Casuarina, Callitris, Cedrus, Thuja, Cryptomeria, and Gum, should be sown thinly, and covered with about a quarter of an inch of finely sifted soil. After sowing, press the soil firmly down, and water with a fine rose. The various kinds of Acacia seeds require steeping in nearly boiling water before sowing. Place the boxes on stones or bricks, taking care to have them level, and in a shady place. After sowing do not allow the seeds ever to want water, even for a single day, or much harm will probably be done. If the seed is sown in the open ground, the beds must be formed with the same sort of soil as is recommended for the boxes. They should also be shaded with grass or straw, the same as flower seeds.

During last September alone 600 000 cases of eggs, of thirty dozen each, were taken into cold storage at the Chicago Stockyards. Two of the largest firms have now in stock about 216,000,000 eggs, which they purchased at prices ranging from 4d. to 6d. per dozen. Another method of preserving which the Chicago packers are adopting on a large scale is the freezing of eggs in bulk. In this case the eggs are broken and emptied into 50lb. cans, which are intended mainly for use in pastry making. [And yet an egg-expert witness at a recent law case in Durban averred he had never heard of cold storage for eggs.]

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co., write:—Trade is very far from brisk; in fact, in many branches, there is an inclination towards depression. The market has been well supplied every morning during the last fortnight, and prices have certainly been in favour of the purchaser.

Mealies.—There is a slight upward tendency, and the average price is now about 10s. per muid

Hay.—Some very good samples offered daily, and while some samples have been as low as 1s. 6d. per 100lbs., good blue grass hay realised 3s. per 100lbs. Bedding from 5s. to 20s. per load.

Forage.—Very little offering; good samples realising 14s. 3d. per 100lbs.

Potatoes.—Market better supplied than it has been for some time past. Early Rose, from 10s. 3d to 12s. 6d. per 100lbs.; Magnum Bonum, from 9s. to 10s. per 10 lbs.; Beauty of Hebron, from 11s. 9d. to 13s. per 100lbs.; Red Roughs, from 8s. 6d. to 13s. 3d. per 100lbs.; Up-to date, from 10s. 6d. to 14s. per 100lbs.; Sweet Potatoes, from 1s. 6d. to 4s. 9d. per sack.

Mabele.—From 5s. to 9s. 6d. per 100lbs.

Pumpkins.—From 2s. 6d. to 8s. 3d. per dozen.

Beans.—From 13s. 3d. to 15s. 6d. per 100lbs.

Buckwheat.—From 10s. 3d. to 12s 6d. per 100lbs.

Eggs—Prices are still firm, and have varied between 2s. 3d. and 3s. 7d. per dozen.

Butter.—Prices have fluctuated between 8d. and 2s. 10d per lb.

Poultry—Common fowls from 2s. to 4s. 4d. each; ducks, from 3s 9d. to 9s. 6d. per pair; turkeys (cocks), from 6s. to 11s. each, hens, 5s. 9d. to 6s. each; guinea fowls 3s. 3d. each.

Sundries.—Mutton, from 4d. to 9d. per lb.; pork, from 7d. to 8d. per lb.; bacon, from 3d. to 7d. per lb.; ham, from 9d. to 11½d. per lb. Several mornings fresh fish was sold.

Fruit.—Apples, bananas, guavas, limes, naartjes, oranges, pears (Avocado), pineapples, and plantains. A number of Australian and Cape apples have realised from 9s. to 14s. 6d. and 17s. per box.

Vegetables—Beans, beetroot, bringals, cabbages, cauliflowers, carrots, lettuce, potatoes, radishes, tomatoes, and turnips have found ready purchasers.

Wood.—Prices have been as low as 5d. per 100lbs., and up to 1s. 1d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Business keeps dull, and with no special feature worthy of remark.

Mealies.—The market is dull to a degree, and heavy losses continue to be made by the farmers and speculators alike, who persisted in holding on to the old crops in spite of big prices and a grand back-end season. The market is easy at from 9s. 6d. to 10s. per bag. The quality of the Coast crop is none too good, and late rains would seem to have done a good deal of damage through rotting the ripe grain while yet on the cob.

Potatoes.—Rates are very firm again owing to farmers holding back, and the state of things is analogous to the mealie market late last year, when farmers refused to sell, despite every inducement. Large supplies of new season's Australian tubers are on the water, and dealers will shortly be more or less independent of the local article. Best qualities bring from 16s. to 20s. per bag, according to the stock daily put on the market.

Mabele.—The crop is heavy, and is being offered in moderate supply. About 16s. per bag is the present figure, but a considerable decline is inevitable.

Hay.—The crop is a record one, and any quantity is on offer.

Two Indians have been sentenced to six months' imprisonment for sheep-stealing on the Eastern Vlei, Durban. The Indian owners of a flock of 82 missed four animals one night, and, when watching the next night, saw the two and another sneak up to a sleeping sheep and wring its neck.

The demand for fertilisers throughout the world seems to be steadily increasing, and it can only be a matter of time for the prices to increase unless new deposits of considerable magnitude are developed. Nitrate of soda has already shown the effect of the enormous consumption of late years. Throughout the world the demand for bone fertilisers is practically in advance of the supply, and prices are high. America ships crude phosphates all over the world, but principally to Europe. In 1899 she exported 812,604 tons, Great Britain taking 95,000 tons, Germany 191,000 tons, France 41,000 tons, and the rest of Europe 186,000 tons. It must be remembered, too, that Europe produces very considerable quantities of crude phosphates, phosphatic slags, and also imports largely from countries other than the United States. The consumption of phosphates in America is also immense, while large quantities of bones, blood, offal, and other animal matter from the slaughter yards are converted into manures. The official records of one State (Georgina) show an annual consumption of nearly half a millien tons of fertilisers. Several other States are equally large consumers, some even exceeding this amount. Throughout America the demand is rapidly increasing, the aim of all being to produce an increased crop on smaller areas through the judicious application of fertilisers.

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AND MINING RECORD.

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CONTENTS.

Horse-sickness Investigations.

By H. WATKINS-PITCHFORD, F.R.C.V.S.

(*Continued.*)

ANOTHER fact, practically the outcome of observation, is that if stables are kept filled with pungent smoke during the night the animals so protected remain free from the disease. Use has been made of this fact in large stables frequently, but in an empirical manner when regarded as a precaution against insect attack. The use of smoke (or "smudges") against the attack of the mosquito is well understood in America and elsewhere.

The point of attack is conjectural, as indeed are all these speculations concerning this theory of the cause of horse-sickness. Probably the more thinly covered parts of the body are generally selected, though from the usual habit of the mosquito the lower leg would be more likely to be attacked. The suggestion that some selective power is exerted by the mosquito causing it to attack the head and thin skin over the eyes — it being here that the first objective symp-

toms are noticed — is probably without significance, as the same swelling over the eyes is produced when the animal is infected artificially by means of the hypodermic syringe.

Another point of conjecture in this theory of mosquito-produced horse-sickness is the species of insect.

Analogy with the malaria-carrying mosquito points strongly to the various kinds of anopheles, and perhaps to some species of the ordinary mosquito or culex, as being possible bearers of the disease.

Anopheles are known to be present over most of the horse-sickness districts of South Africa, and it is probable that further investigation would prove their widely spread distribution throughout the whole continent.

This insect, which should be recognised by everyone as a possible menace to health, can be distinguished without much difficulty from the ordinary mosquito, by the existence of spots — or maculae — upon the wings when held up to the light, and also by the insect's peculiar attitude when resting upon any object, for it appears to stand with the proboscis, which is in a line with the body, touching the surface, and the posterior part of the body elevated at a considerable angle, by reason of the length of the hind legs. The ordinary mosquito, it will be noticed, rests with its body almost parallel with the surface upon which it alights.

Modern science has within the last few months shown the imperative necessity of keeping all person suffering from malarial fever closely guarded against the attacks of these anopheles, as it is in this manner chiefly if not solely that the disease is communicated to others. This short digression is not entirely inappropriate to the subject under consideration, as I have observed the anopheles feeding upn horses, both in health and sickness, and have noticed them abstracting blood from their host until greatly distended.

There remains further, when considering this insect theory of the disease, the possibility of the agency of other than the winged insects — such as members of the arachnidae or ixodiae (spider and tick family) — being concerned. There seems, however, no evidence, direct or indirect, to point to the likelihood of an intermediary active agent being found amongst these orders. The whole weight of experience goes to show that the hours between sunset and sunrise are more dangerous than the hours of daylight, that moist or marshy places are particularly to be avoided, that rain is followed by a period of immunity, that enveloping animals with smoke increases their safety, and that the cause of the disease is capable of rapid transmission from place to place. This combination of evidence would seem to negative the agency of such comparative immobile insects as ticks, spiders, etc., whose habits cannot satisfy the equation under consideration.

In concluding this brief review of the possible connection between the puncturing insect and South African horse-sickness, the fact should again be recalled that the foregoing theories and suggestions are of a speculative and tentative nature, and put forward rather with the object of tabulating and bringing before our review a *résumé* of our experiences rather than with the idea of setting forth a scientific thesis, capable of untying the Gordian knot which has puzzled us so long, and this theory (the Subcutaneous or Insect Agency theory), is put forward with more hesitation, as up to the present* it has received no notice at the hands of workers with the disease, except in the instance quoted above, in which insects were acquitted of being concerned in the production of the disease.

(B.) The Respiratory Theory (or the theory dealing with the probability of a horse becoming infected by inspiring the germ of the disease.)

Here again there is an absence of direct evidence tending to prove the probability of the above theory. That such a mode of entry of the organism is possible is almost conclusively proved by the fact that injections of virus or infective

* This short *résumé* of South African Horse-sickness was written on board ship, during the writer's sick leave, in the autumn of last year, and is published now for the reasons given in the introductory article on this subject in the *Journal*.

fluids into the windpipe of the horse will produce the disease. To this fact, however, too much weight cannot be attributed, for the writer has also by a similar intra-tracheal inoculation produced red-water in a susceptible ox. This latter result, however, cannot be looked upon as impeaching the evidence, now so thoroughly confirmed, that red-water is produced through the inoculating bite of the specifically infected tick, and not by the entry of the organism through the lungs. The fact, however, of its being possible to produce horse-sickness in this way would seem to point to the bronchial or alveolar epithelium or lining, forming a point from which infection may take place. That such a possibility exists in a perfectly normal respiratory membrane seems improbable, although in this connection the extremely small size of the causal organism should be borne in mind, passing, as it does, with ease through the finest and closest filters of atomaceous clay.

The fact of the chief characteristic post portem appearances being referred to the lungs may possibly have led past observers to entertain the respiratory view upon such evidence. Nothing, indeed, in the symptoms during life or appearances after death exists to warrant such a theory untenable.

The striking exudation which takes place into the lungs seems to point to these organs as being specifically involved in the progress of the disease.

(*To be continued.*)

The April Rainfall.

THE rainfall during the last month was exceptionally good, especially along the Coast The rainy season is practically ended, and a comparison between the rainfall of the present and the last year can now be roughly made. According to the *Journal's* returns, Cornubia comes out first with 49·25 inches for ten months, against only 24·53 inches for the last year. The Government Observatory returns show as the highest Eshowe, 47·09 inches for the present year. Mr. A. Wilkinson writes :—"The ground has got a good soaking, making most of the springs to run again. The cane has made a great growth the last month, and with some small rains during the winter, the prospect is for a fair crop next season ; it takes, however, two wet summers to make a heavy crop of cane." Gorton, Ixopo, still suffers from great drought. The rainfall for the ten months was only 13·17 inches ; for the last year the fall was 21·10 inches. The heaviest rainfall recorded for one day was 5·91 inches at Mount Edgecombe. The exceptional character of the year from a meteorological standpoint will apparently continue till the end. On Friday last a sharp thunderstorm passed over Maritzburg, and on the same day there was a heavy hailstorm in the neighbourhood of Balgowan, happily, however, unaccompanied by wind, and in consequence doing but little injury. It is the first hailstorm in May that those living in the locality remember having seen.

District Reports.

BULWER, 16th May.—Through my absence on hut and dog tax collections, and other duties, I was not able to furnish the regular fortnightly reports for April. I have now just returned from a visit through the upper part of this Division, along the Drakensberg. Unfortunately I was unable to reach the top of the Berg, which would have given me a better opportunity of viewing the surrounding country, through a heavy gale having set in, and I had to beat a hasty retreat, as it was becoming dangerous for man or beast. I was much struck by the veld being so beautiful and green along the country above the frost belt. The first frosts to speak of visited this District on the 8th inst., and the weather since that date has been decidedly cold. Green grass or veld will soon be a thing of the past ; all the autumn brands have been cut up by the frost. I am glad to report that all kinds of stock are almost free from disease. Horsesickness has been very mild ; only odd cases have occurred at a few

farms in the district. This only applies to the horses bred, or that have been in the district some time. The mortality in the loot horses bought at public sales from the Imperial Government has been considerable, and likely to continue. Hay making has been in full swing all over the District, and the weather has been all that could be desired for the purpose. The rust in the autumn forage crops has been as bad as ever, I am sorry to say. Farmers are now giving a good deal of millet as a substitute for oats or forage. I saw one splendid sample of Sidonian forage baled at Mr. Arbuckle's farm "Costmore." The crop was grown in the spring, which I am informed is the only time to grow a forage crop if the rust is to be avoided. Mealie reaping has been already commenced by many farmers; I think from all accounts the mealie crop will be good.

H. W. BOAST, Magistrate.

DUNDEE, 14th May.—There is very little agricultural news to report, owing to the late unsettled state of the District. Mortality amongst cattle is abnormal, owing to black lungsickness being so prevalent. I am informed by an old farmer that the disease has not been so bad for 20 years. Horsesickness is also very bad. The weather is hot and rain is badly wanted, but, in spite of this, the crops, what there are, are in a very flourishing condition. There was a fearful duststorm yesterday, and a sharp frost last night.

W. G. WHEELWRIGHT, Acting Magistrate.

INANDA DIVISION, 17th May.—Since my last notes, Verulam and Division have been visited by a severe epidemic of dengue fever. It is said that fully 95 per cent. of the European inhabitants of the township have suffered. I believe the percentage in the country has not been so high. The epidemic still continues, but now we have had very cold weather it should soon come to an end. I am sorry to say I was amongst the majority, which has, in a great measure, been answerable for the long interval since I last sent a report to the *Journal*. The attacks of dengue seem to have varied considerably in virulence, some having a very severe attack, while others got off with one or two days' illness, and soon recovered from the unpleasant after effects. I have been wondering whether the mosquitoes have anything to do with spreading the infection, as they have been a perfect plague here this summer, and are still in evidence. The following are a few of the meteorological observations made here during March and April:—March—Rainfall 6·8 inches, which fell on fifteen days; heaviest fall 1·65 inches on the 15th. Maximum temperature in the shade 95 degs. on the 17th, minimum 66 degs. on the 30th. April—Rainfall 5·21 inches, which fell on seven days; heaviest falls 2·65 inches and 2·07 inches on the 2nd and 3rd respectively. Maximum temperature in the shade 90 degs. on the 29th, minimum 57 degs. on the 29th and 30th; mean for month 74·6 degs. It will be seen that nearly all the rain for the month fell in the first day or two, the rest of the month being practically rainless. The ground has in consequence become very dry and streams very low again. A good rain now would do good. The weather has been quite cold the last few days, and I hear there was frost in the hollows on the night of the 13th inst. It does not, however, appear to have been sufficient to damage cane. The mealie crop is, with the exception of a few smaller patches here and there, all harvested, and has proved a very fair one, but I hear a good many mealies were damaged by the heavy rains in March and early part of April, while many have gone rotten through the Indians harvesting and bagging them before quite dry, in order to get them on the market before prices fell. Result, dead loss, sometimes to the purchaser, sometimes to the Indian, and one is unable to sympathise with the latter in the circumstances. I hear the price is now 8s. per muid, though the middleman is still charging 12s. 6d. and upwards. The tobacco crop has all been gathered, and is a bumper one—I should imagine the largest ever grown in this Division. Beans and peas are now to be seen in all directions, where recently mealies and tobacco were growing, and thus the Indian farmer goes on taking the utmost out of his small patch of land without returning anything to it except what nature may do through the medium of the growing bean or pea. The cane plantations continue to look very fine, though they would be none the worse of a rain now before the long winter dry spell sets in. Two mills, the large central ones at Mount Edgecombe and Tongaat, have recommenced crushing, the latter after a very short stoppage of only about a month or six weeks. I hear the density of the juice is very good. The yield this season should, therefore, be a good one. Travelling between Umgeni and here (Verulam) on the 15th inst. I saw two immense swarms of locusts. These must have come from beyond the area of locust destruction operations in this Division, as no such swarms could ever have stood a chance of reaching maturity within the area. It must be very aggravating to find one's efforts frustrated by large swarms coming from places where nothing is done to keep down the pest. I do not think many young locusts in this Division are ever allowed to reach maturity. I am glad to say that the lungsickness referred to in my last report has not extended. In fact, the area has been curtailed, as the suspected outbreak amongst an Indian's cattle near Umhloti Mouth proved not to be lungsickness. Horsesickness seems to have been somewhat bad at the end of the season, and I hear of a good many cases and deaths having taken place. Now that the cold weather has really set in we should hear no more of this disease this season. Oranges are plentiful, and though not quite ripe yet they are sweet and fit to eat, and very large, having been swelled out by the late rains. Moths are, however, attacking them, also naartjes, causing them to drop off, which is very unfortunate, as this renders the crop of very short duration. The Lands Commission has been here, taken evidence, and gone again.

JOHN L. KNIGHT, Magistrate.

NEW HANOVER, 20th May.—Since writing my last report several heavy frosts have fallen,

which, I hope, have put a stop to horse-sickness. The want of labour is still acutely felt by the farmers who have not taken the precaution of engaging indentured Indians, and who are therefore obliged to rely on the good graces of the Native. As the latter is receiving wages from the Military at the rate of £2 per mensem, and 2s 6d. per diem as a togt labourer in Durban, he merely laughs at the small wages offered by farmers. Those Natives who are under written contract with their masters are dissatisfied because they do not receive as much as their friends who go away from home. They absent themselves from their work, and eventually the matter ends in a Court case, or very often does not end there, but the Native goes back and gives more trouble. On enquiry into the case it will generally be found that the Native agreed to the contract after receiving a loan of money. With his inborn lack of foresight he will bind himself to work for the loan at the small wage of 10s., sometimes less. When better times come, he generally gives trouble.

A. RITTER, Magistrate

UBOMBO, 3rd May.—The weather during the past month was inclined to be cloudy and showery, and much cooler than usual. The daily maximum and minimum temperature, I regret to say, was not recorded during my absence. The rainfall recorded was 2·32 inches. Natives harvested the bulk of their mabele, and beer-drinking was the order of the day, consequently. Mealies were not quite ready for harvesting. Pumpkins and sweet potatoes seemed abundant and should give good crops, unless the autumn drought rules otherwise. Only one death occurred among cattle, from gall-sickness.

A. R. R. TURNBULL, Magistrate.

Garden Notes.

By W. J. BELL, Florist and Seedsman.

THE SOWING AND GERMINATION OF SEEDS.

SUCCESS in the cultivation of vegetables and flowers depends to a great extent in some of the earlier operations, such as sowing of the seeds and treatment of the same during the process of germination. The temperature required for germination varies considerably in different seeds. Some demand a tropical heat, and others are satisfied with the warmth of early spring. Some seeds will bear a temperature that would kill others. Cereals and beans can only bear immersion in water at 110 Fahr. for a few minutes; on the other hand seeds of Acacia especially, if old, will bear boiling for several minutes, and germinate much quicker. Some of the hardy annual and perennial flower seeds will refuse to germinate during the hottest part of our summer, viz., December, January, and February. Larkspur may be taken as an example. This should be sown in the District of Maritzburg in the autumn (April or May), and will flower in October or November following. If, after flowering, the plants are allowed to stand, for the seed to ripen, it will fall and remain in the soil dormant all the summer, not germinating till the cold weather sets in again in the autumn. The seed of the balsam may be taken as an example of the very opposite. This ripens quickly, and the shed seed will be germinating before many of the parent plants have done flowering. Some seeds will only succeed in shady sheltered situations in this climate, such as daisy, primrose, polyanthus, foxglove, violet, and pansy. Others again, such as portulaca, nasturtium, balsam, require warm sunny positions, and will not thrive in any other. For instance, portulaca sown in a shady, damp situation would be an absolute failure, but sown in a hot, dry position, where it will have the full blaze of the sun most of the day, there is nothing that will produce such a dazzling display of colour during the summer months. A frequent cause of failure is sowing seeds too deep; a safe rule is to sow about twice their own depth; very fine seeds require little or no covering at all, a mere pressing into the soil in many cases being sufficient, but in these cases it should be noted that when seeds are so near the surface as to be scarcely covered with soil, it is necessary to exclude the light while germination is taking place. Where boxes are used, this is usually done by covering over with a board, tile or slate, or even a sheet of brown paper. Whatever covering is used should be removed, and light gradually admitted, as soon as germination has commenced, otherwise the seedlings will be drawn. When seeds are sown in the open ground, either in beds or borders, the same rule applies not merely to exclude light, but to afford protection from the drying effects of sun and hot

wind. A thin layer of any kind of light litter such as straw, hay or cut grass, will do, which can easily be removed after the seedlings are through. The covering serves another useful purpose. The constant watering necessary to start the seeds into growth in hot dry weather has the effect of hardening the exposed surface of the soil to such an extent as to make it impossible for the seedlings to push through. The shading retains the moisture, by checking evaporation, and preserves the surface in a fit state for successful germination.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 19th June next :—

Estcourt.—White she goat, two grey he goats, young black goat, two grey she goats.

Richmond.—Bay gelding, 13 hands high, tail cut square, no marks or brands.

Dundee.—Five Angora goats, different ear marks.

Greytown.—On the farm "Blackheath," of Mr. E. Varty, red cow, white face and belly, branded on right buttock EV., with a red heifer calf at foot, about four months old.

The stock impounded as hereunder will be sold, unless previously released, on 3rd July next :—

Pietermaritzburg.—Dark bay mare, black points, hind feet white, white star on forehead, tail cut square, branded AB on right hind quarter, few white spots on back, about 13.2 hands, and about six years old. Headstall on.

Moss Dale.—Ninety-seven sheep, different brands, star in circle, S5 or 55, C2, some of the brands indistinct. Dark brown mule (mare), no brands. Brown colt, black legs, about nine months old, no brands.

Weenen.—Red bastard Africander ox, slit and square in left ear, branded E, encircled in heart, on left shoulder, aged.

Springfield.—Dark brown mare, branded JVM indistinct, halter on.

Ndwedwe.—Dark brown mare mule, small patch of white on wither, branded, looks like B on near hind quarter, long scar above brand.

Greytown.—Red-and-white cow, white face, point off left ear, small slit under left ear, square cut top right ear, long tail all white, branded, looks like TV on right buttock, aged, with a red heifer calf at foot, no brands or marks visible, about eight months old. White cow, black cheeks, white face, black spots all over body, neck and legs, point off left ear, square cut top right ear, long white tail, branded, looks like TV on right buttock, aged, with a light red heifer calf, little white on belly, no brands or marks visible, about seven months old.

Impendhle.—Cream mare. Cream colt foal. Cream mare. Bay mare, star on forehead, white on off forefoot. Black colt foal. Chestnut mare, star on forehead. Chestnut filly foal, star on forehead. Bay mare. Bay colt foal, white streak on face.

"Natal Plants."

WE are in receipt of Part II., Vol. 3, of "Natal Plants." The present instalment of Mr. J. Medley Wood's botanical *magnum opus* is in every respect equal to the portions which have already appeared. The drawing of the numerous plates is excellent, and deserves special recognition. The work of the printers, Messrs. Bennett & Davis, Durban, is particularly good.

Agricultural Shows.

Umvoti County, Greytown, Thursday, May 30th. Secretary, J. M. Handley, Greytown.

Polela, Bulwer, Wednesday, June 5th.

Lion's River Division, Howick, Thursday, June 27th. Secretary, G. Hutchinson, Balgowan.

Ixopo, Wednesday, July 3rd. Entries close June 22nd. Secretary, A. Keith, Ixopo.

Richmond, Wednesday, July 10th. Secretary, John Marwick, Richmond.

Alexandra, Umzinto, Thursday, July 11th. Entries close July 2nd. Secretary, R. G. Archibald, Umzinto.

New Hanover, Wednesday, July 24th. Secretary, H. A. Light, York.

This improved system of announcing the Agricultural Shows we adopt from "Agricola" of the Natal Witness.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of April, 1901.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1900.	Total for same per'd from July 1st, 1899.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	82·0	64 7	85·7	57·6	6·56	12	4·45	3rd	40·74	24·48
Stanger...	82·3	62·8	92·0	58·0	3·25	15	1·30	27th	34·48	21·16
Verulam	87·8	66·6	90·0	57·0	5·21	10	2·65	2nd	37·65	22 74
Greytown	84·5	60·6	92·0	52 0	2·05	8	0·67	2nd	29·01	22 76
Newcastle	...	54·3	...	48 0	3·53	7	1·16	2nd	38 21	...
Estcourt	78·2	52·8	85·0	42·0	1 55	8	0·65	3rd	29 59	25 30
Port Shepstone ...	75·3	...	80·0	...	2·63	16	0 48	3 d	37 90	36·49
Umzinto	83·3	63·8	85·0	60 5	5.70	7	1·75	4th	33·54	28·02
Richmond	77·1	55·5	87·0	45·0	2·90	10	0·78	21st	31·27	33·12
Maritzburg	80 6	56·9	89·0	46·0	2·75	11	0 73	4 h	32 27	28·86
Howick	78·6	5 .·3	87·0	42 0	3·70	14	1·35	6th	24 56	2 5 3
Weenen	85·3	54·5	95·0	43·0	1·18	.8	0·57	2nd	27·40	20·08
New Hanover ...	77·8	54·0	87·0	42·0	3 63	13	1·02	4th	34·15	28·49
Hillcrest	74·4	60 6	85·0	53·0	2·70	11	1 21	4th	35 21	...
Mapumulo	81·6	59·8	90·0	51·0	3.12	7	1·56	5th	34·67	29·01
Nongoma	77·0	59 8	87·0	50 0	4·21	5	2·50	7th	42 57	26·18
Umlalazi	80·0	65·0	88·0	49·0	2·66	3	1 94	4th	...	...
Melmoth	83·5	59.1	94·3	51·0	0·72	6	0 30	4 th	30 27	...
Eshowe...	78·9	62 0	89·0	53·0	3·14	9	·77	4th	47 09	...
Point	...	..	...	...	7·43	7	3·85	3rd	32·78	24·15
South Coast Junction	...	...	. .	...	7·37	11	4 36	3rd	...	...

OTHER STATIONS.

Estcourt	...	...	85	38	1·58	7	0·48	3rd	30·81	26·73
Nottingham Road ...	...	...	...	...	2·78	11	0·54	20th	...	37·17
Adamshurst	...	...	79	48	2·57	13	0·45	5th	26·94	28 21
Hilton	...	...	84	46	3·50	12	1 07	4th	32 37	36 00
P.M.B. Tn.Bush Valley	...	...	...	...	4·94	10	1·91	4th	41·10	51 06
Ixopo, Gorton... ...	...	...	82	56	0·81	4	0·30	4th	13·17	21 10
Ennersdale	...	...	...	...	1·18	4	0 56	2nd	...	...
Mid Illovo	...	...	78	53	3·23	7	1·58	1st	36·45	27· 4
Ottawa	...	..	...	...	6 21	5	4·33	4th	38 80	24 17
Mount Edgecombe ...	...	...	...	...	7·70	5	5·91	4th	4·18	19·12
Cornubia	...	...	...	...	8·68	...	...	...	49·25	24·33
Milkwood Kraal ...	...	...	...	...	4·22	...		.	31·18	19 99
Blackburn	...	...	...	...	7 17	...	...	...	37·95	23·43
Saccharine	...	...	...	...	6·63	...	...	...	43·69	29·26
Prospect Hall... ...	...	...	...	...	6.82	...	...	...	44·88	..
Clairmont	...	...	...	...	7·04	6	4·47	3rd	43 11	24 25
Equeefa	...	...	87	59	8·70	7	3·19	13th	37.43	26·29
Umzinto, Beneva ...	...	...	...	...	5·86	6	2·13	4th	33 17	29·07

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co., write:—There is very little alteration in prices since our last report. Trade in many branches is very far from brisk. Produce all round is more plentiful, but there is very little demand in many lines. Eggs and poultry still command high prices; and onions are now considered a luxury, in fact the price is almost prohibitory.

Mealies.—Grain is now firming, not that there is any particular demand. Speculators are doing their best to boom the market; whilst some of them are selling at prices considerably below what they are trying to force the market to. Some samples on the market have been down to 11s. 6d. per muid, including sack, and some have realised 14s. 4d. per muid. However, a good quantity of mealies have changed hands at prices varying between 11s. and 12s. per muid, including sack.

Forage.— Still commands high prices; some samples have been as low as 6s. 6d., others 12s. 9d. per 100lbs.

Hay.—There is a good supply at present, and prices vary between 1s. and 3s. 4d. per 100lbs., according to sample. Bedding from 2s. 9d. to 20s. per load.

Potatoes.—Early Rose, from 11s. to 15s. per 100lbs; Beauty of Hebron, from 8s. to 14s. per 100lbs.; Rough Reds, from 6s. 3d. to 10s. per 100lbs.; Sweet Potatoes, from 1s. to 4s. 6d. per sack.

Pumpkins.—From 5s. to 8s. per dozen.

Beans.—From 7s. to 7s. 6d. per 100lbs.

Mabele.—There is an abundant supply of this grain at present, and prices have fallen considerably. Some samples have been as low as 5s. 3d., others 7s. 9d., per 100lbs. From information, there has been an enormous quantity cultivated this season.

Buckwheat.—This grain seldom finds its way into our market in any quantity, and prices now rule from 10s. to 11s. 3d. per 100lbs.

Tobacco.—From 1s. to 1s. 0½d. per lb.

Onions.—Never in the history of our market have onions realised such high prices; 46s, 50s., 57s. 6d., and as high as 60s., per 100lbs. have been obtained by our Market Master.

Eggs.—Prices are high at present; and, whilst some samples have been sold at 1s. 6d. per dozen, others have been as high as 3s. 3d., 3s. 6d, and 3s. 7d. per doz.

Butter.—Far from plentiful. Inferior brands have been down to 6d. and 1s. per lb., but good samples have been sold at 2s. 5d., 2s. 8d., and 2s. 10d. per lb.

Poultry.—Very scarce, and prices have varied between 2s. 6d. to 4s. 10d. for common fowls; guinea fowls, from 4s to 7s 3d. per brace, ducks, from 3s. 3d. to 10s. 3d. per pair; turkeys (cocks), 11s. 3d. to 15s. each (hens), 6s. 9d. to 7s. 3d. each.

Vegetables.—Beans, beetroot, cabbages, cauliflowers, celery, lettuce, onions, peas, potatoes, pumpkins, turnips and tomatoes sold every day.

Fruit.—Apples, bananas, guavas, lemons, limes, naartjes, oranges, papaws and pineapples sold in large quantities daily. A number of imported apples have also been disposed of.

Sundries.—Beef, mutton, pork, and the usual mixture of almost every description, have been disposed of.

Wood.—Prices have ruled at almost everything between 6½d. and 1s. 1½d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade is rather better this last fortnight, but there is still room for improvement in this respect.

Mealies.—There are large enquiries for Colonial grain, from both the Transvaal and Cape Colony. As a consequence the market has sensibly hardened, though comparatively small quantities of the new crop are as yet available. Dealers continue to offer 10s. per bag, but growers are not very anxious to part at that figure.

Potatoes.—The market is fairly well supplied, but only from hand to mouth, and as a result prices are keeping up to a very high level indeed. Blight seems to have damaged the crop to an extent hardly realised, best qualities being from 22s. to 25s. per bag. Importations, however, will bring down rates to a level more in conformity with the spending power of the working classes, to whom a potato nowadays is an almost unattainable luxury.

Mabele.—Fair demand, but the high price of this staple is hardly warranted in face of the record crop this season. Good dry samples bring about 16s. 6d. per 203lbs.

Hay is in good supply, with fair demand. The quality seems very good this year.

Bran.—Quotations lately have been in favour of the buyer, but Port Elizabeth being a proclaimed port this week, the importation of bran will forthwith cease, so that the market is bound to firm immediately. From 6s. 9d. to 7s 9d. per 100lbs. is to-day's quotation, according to quality.

Australian frozen mutton at 4½d. per lb. in London is not as satisfactory for shippers as at 3½d. The former price means very restricted consumption The latter means good remunerative rates, with a steady demand.

Thos F. Rigg, in the *American Poultry Journal*, says that one reason why the English produce birds of larger bone and frame than we do in this country is because they feed, and have always so fed—a ration of oats, wheat, and other grains, which are rich in blood and bone-producing properties, and that Indian corn enters but slightly into the food supply.

Dairying in Australia.

THE HON. F. R. MOOR'S IMPRESSIONS.

(*Continued.*)

MILK TESTING.

THE following is a further instalment of the pamphlet :—

Short Instructions.

There are three vital points in milk testing that must be recognised in order to insure reliable results. The first is to secure a proper representative sample of the milk to be tested. The second is to get a true sample from the composite test bottle into the test flask. And the third point includes careful attention to all the remaining details of working.

Preparing the Sample Bottles.

Composite samples give reliable results, and save the trouble of daily testing. Special graduated bottles are in the market, and may be obtained very cheaply. Rubber corks should be used, as they are easily kept clean and sweet. Pure formalin is the most satisfactory preservative for keeping the samples. Four drops of formalin added with a medicine-dropper is sufficient to put in the composite bottle. The bottles should be thoroughly cleansed after each testing is done. For use on the farm, the names or numbers of the cows can be attached to the neck of the bottles, and at the creamery or factory the name or number of the supplier can be attached.

Securing the Samples.

After a cow is milked, and the milk weighed, pour it from one bucket into another and then back before taking the sample. Immediately afterwards take some with a cup or measure, and put some into the composite bottle. The same quantity should be added each time, and at the end of each week the bottle will contain a representative sample of the milk for that period. In a factory or creamery the drip system is the most reliable.

Measuring the Test Sample.

The contents of the composite bottles should be thoroughly mixed. If the cream has set or is hard to mix, the bottles should be placed in warm water, at a temperature of 120 deg. for a few minutes. The cream is then more easily dissolved and mixed with the milk. A bottle extender greatly facilitates the mixing when the bottles are too full to shake. The sample is measured with a 17.6 c.c. capacity pipette, and put in the test flask. To prevent spilling, the flask should be held at an angle to allow the air to escape.

The Sulphuric Acid.

For milk-testing, sulphuric acid of 1.827 specific gravity is used. Special hydrometers for ascertaining the strength of the acid cost 3s. 6d. each, and a glass jar for holding the acid 1s. 6d. When using the hydrometer the temperature of the acid should be 60 deg. Fahr. Never put a metal or wooden frame thermometer in the acid, only glass or porcelain vessels should be used. The acid bottle should be kept corked when not in use, as it absorbs moisture from the air if exposed and becomes weak. The acid and milk ought to be about 70 deg. in temperature before mixing. It is neglect of temperature and strength of acid that causes a white curdy matter, or a black charred substance, to appear in the fat column. This temperature may be secured by placing the test bottles in a water bath of the desired heat after measuring. The acid may be cooled or heated in the same manner, but before measuring. Altering the strength or quantity of the acid is not recommended. All bottles containing sulphuric acid should have glass ground stoppers. The

bottles should always be labelled "Poison," and kept out of the reach of children when not in use.

Measuring the Acid.

The acid is measured with a 17.5 c.c. glass measure, and poured down the inside of the neck of the test flask without disturbing the milk. The test flask should be held at an angle to allow the air to come out as the acid goes in, to prevent spilling. The test samples may be shaken separately by hand or together in a cradle. It is possible to dissolve the milk in less than the quantity of acid added, and sometimes a clear layer of acid remains at the bottom. This can be overcome by giving the bottles a good shaking with a reverse motion before finishing.

Whirling the Bottles.

The speed at which the machine has to be turned depends on the gearing, and the diameter of the testers. If the bottle-wheel of the machine is 12 inches in diameter, that wheel should be made to turn 980 times per minute. If 18 inches in diameter, 800 revolutions per minute, and if 24 inches in diameter, 693 revolutions per minute. If the bottle-wheel is 18 inches in diameter, and geared to revolve ten times for one turn of the handle, the operator should turn the handle 80 times per minute to attain the necessary speed. If the bottle-wheel be geared by friction, care should be taken that no slipping takes place. For factory or creamery use the steam-turbine machines are far preferable to the others.

Adding the Water.

After turning the tester for six minutes, hot water, 180 deg., is added up to the neck of the flasks. Rain or soft water should be used for this purpose. After adding the water the machine is turned for three minutes, then more water is added to bring the liquid up in the neck of the flask to between the 7 and 10 mark. Another minute's turning, and the operation is complete. If only a few samples are to be tested, the water may be added with the milk pipette; but where a large number have to be done a can with a rubber tube and pinch-cock is handiest.

Reading the Tests.

A pair of fine-pointed dividers is of great assistance in taking the measurement of the fat column. The fat is measured from the lower line between it and the water to the top of the column. Having taken that span with the dividers, one point is placed at 0, and the other will show the percentage of fat on the scale on the neck of the bottle. Each large division represents 1 per cent., and each small space two-tenths or 0.2 of 1 per cent. In very cold weather the fat column often partly solidifies before a reading can take place. This may be prevented by keeping up the temperature of the samples. Hot water may be put in the pan of the machine, and the test flasks placed in warm water after whirling is finished, until the readings are recorded. This precaution is not necessary for the greater part of the year.

Computing the Butter Contents.

In order to arrive at the commercial butter contents in milk per the respective butter-fat percentage, it is necessary to deduct a small loss that takes place in skimming, plus another loss that occurs in churning, and then add a percentage to make up for the usual quantity of water, curd, and salt contained in commercial butter. As a net addition is different with each test it is impracticable, as well as a waste of time, to work out each result in such a roundabout method. The following table of test values agrees with the Babcock table adopted by most of our factories. All milk should be reduced to butter, per its test, before quoting its money value. This system is more precise and equitable than differential rates per gallon, and is not liable to many misleading and complicated interpretations. Many useful hints, together with detailed instructions, are generally issued by the makers of each machine. Beginners should take a few lessons in the use of the Babcock tester from someone who has had experience.

VALUE OF TESTS. BABCOCK TESTER.

Tests.	Lbs. of Milk required to make 1 lb. Butter.	
	Correctly in Decimals.	Approximately in Fractions
3·0	30·58	30½
3·1	29·58	29½
3·2	28·51	28½
3·3	27·62	27½
3·4	26·73	26¾
3·5	25·90	26
3·6	25·15	25
3·7	24·45	24½
3·8	23·74	23¾
3·9	23·12	23
4·0	22·52	22½
4·1	21·94	22
4·2	21·35	21¼
4·3	20·81	20¾
4·4	20·29	20¼
4·5	19·80	19¾
4·6	19·34	19¼
4·7	18·89	18¾
4·8	18·46	18½
4·9	18·05	18
5·0	17·67	17¾

To compute the number of pounds weight of butter contained in milk.

Divide the pounds and decimals of a pound, of milk agreeing with the test result, into the total number of pounds of milk.

Example—1,000 lbs. of milk tests 4.0 per cent. butter fat.

It will be seen above that it takes 22.52 lbs. of milk testing 4.0 to make one pound of butter.

Therefore :—22.52)1000.00(44.4

9008

9920
9008

9120
9008

112

44.4 lbs. of butter are computed to be contained in 1,000 lbs. of milk with a 4.0 test.

THE UTILITY OF TESTING COWS.

The accompanying table of the actual return of a small dairy herd of Victorian cows has been complied with a view of impressing on dairymen the great advantage to be derived from recording the results from each and every cow.

It is all very well to judge a cow by appearances, but practical men are well aware that many a fine-looking cow is unprofitable for the dairy. At the present time it is fully recognised that there is no way so reliable to tell a good cow from a bad one as a scales and Babcock tester. The average Victorian cow has the reputation of giving a very small return as compared with the cows of many other countries. Whether this is so or not is open to question, and would be a difficult query to settle definitely.

From previous records it would appear that Victoria possesses some cows almost as good as are to be found in any part of the world. No doubt the greater number are anything but profitable for dairying.

If bad cows were known for certain and weeded out, and the remaining cows received better attention, our prospects would be bright indeed in the dairying line.

DESCRIPTION OF HERD.

The herd of cows under review is a cross-bred one. There is more shorthorn blood in them than anything else. About three-quarters shorthorn and the rest a mixture, but no Channel Island blood whatever.

METHOD OF TREATMENT.

They did not receive any special attention. Each cow was treated alike, and they were all pastured together. With the exception of a limited supply of potatoes for a few weeks, the cows had nothing but straw in addition to pasture. In common with the herds in many parts of the Colony last season, this one was reduced to skin and bone for some months.

As a consequence the cows did not, at their best, give more than three-fourths of the yield of a normal season. They were kept in the Koroit district, and the dairy formed an auxiliary to other branches of farming.

Cows going out of milk at the beginning of the year and disposed of are not

included. Neither are heifers coming in before the close of the year. All cows are quoted that could be said were on the farm the year round. Some of those milked for six months and others up to eleven months.

A Victorian Herd.

Summary of Returns for Year ended 31st December, 1897.

(Compiled by R. Crowe.)

No.	Name.	Milk.	Test.	Butter.	Price.
		Galls.		Lbs.	d.
1	Caroline ...	697	4·2	326·41	8
2	Star ...	641	4·2	300·18	8
3	Spot ...	630	4·2	295·03	8
4	Lottie ...	583	3·6	271·55	8
5	Bess ...	531	4·5	268·04	8
6	Kitty ...	563	4·2	263 65	8
7	Lily ...	509	4·6	263·15	8
8	Stumpy ...	732	3·2	256·63	8
9	Fanny ...	575	4 0	255·24	8
10	Flo ...	697	3·3	252·31	8
11	Bawley ...	619	3·6	246 12	8
12	Mary Ann...	662	3·3	239 64	8
13	Jenny ...	670	3 2	234·89	8
14	Blossom ...	666	3·2	233·49	8
15	Polly ...	587	3·6	233·38	8
16	Snaily ..	521	4·0	231·27	8
17	Judy ...	502	3·8	211·44	8
18	Rosy ...	594	3·2	208 24	8
19	Lady ...	435	3·9	188·13	8
20	Bonny ...	430	3·9	185·97	8
21	Dolly ...	421	3·8	177·32	8
22	Molly ...	392	4·0	174 01	8
23	Matilda ...	492	3·2	172 48	8
24	Liz ...	399	3 8	168 05	8
25	Princess ...	409	3·7	167 28	8
26	Betty ...	385	3·9	166·56	8
27	Cherry ...	375	4·0	166 46	8
28	Nelly ...	471	3·2	165 12	8
29	Violet ...	359	3·3	151 20	8
30	Gloss ...	347	3·8	146·15	8
31	Redmond ...	365	3 6	145·11	8
32	Pansy ...	299	3 7	122·29	8
		16,658	...	6,866·79	...

Analysis of Summary.

The average number of pounds of milk required to make a pound of butter was 24.19.

The average return in milk per head was 520 gallons, of butter 215.21 lbs., and in money £7 3s. 5d.

The return in milk from the best eow was 697 gallons, from the ten best an average of 625 gallons, from the ten worst an average of 390 gallons, and from the worst cow 299 gallons.

The return in butter from the best cow was 326.41 lbs., from the ten best an average of 275.21 lbs., from the ten worst, an average of 157.07 lbs., and from the worst cow 122.29 lbs.

The return in money from the best cow is £10 17s. 7d., from the ten best an average of £9 3s. 5d., from the ten worst an average of £5 4s. 8d., and from the worst cow £4 1s. 6d.

Striking Deductions.

In order to make the lesson more instructive, it is assumed that the cost of each cow's keep for a year amounts to £2 10s., and the cost of attention is £1 10s. This £4 is estimated to sufficiently provide for rent or interest on the investment for each cow's keep, and the labour involved. Anything returned over that sum may be looked upon as profit.

Therefore the best cow gives a profit of £6 17s. 7d., the ten best average £5 3s. 5d., the ten worst average £1 4s. 8d., and the worst cow a profit of 1s. 6d. The best cow gives over 91 times as much profit as the worst one, and the profit from the ten best cows amounts to nearly the gross return from the ten worst cows.

An Interesting Comparison.

Many dairymen believe in cows that give a large quantity of milk ; others believe only in cows that give a good test. Both are right to a certain degree, and to be safe, the quantity as well as the quality must be taken into account.

Attention is directed to the two cows Nos. 7 and 8. The latter gives 223 gallons more milk than the former, and yet brings in less money. Both are almost equally profitable cows, although one gives a 4.6 test and the other only 3.2. The goal can really be secured by widely-differing routes.

Another Comparison.

In looking over the monthly charts containing the records of those cows, it is found that "Lady," No. 19, gives the largest quantity for that period. The following monthly comparison is interesting :—

No.	Galls Milk.	Test.	Butter.	Price.	Value.
19	140	3·7	57·26	8d.	£1 18 2
2	89	3·7	36·40	8d.	£1 4 3

The best return for a month by cow No. 2 is quoted, and in the monthly comparison No. 19 cow would get credit for being by far the more profitable animal. However, in looking at the year's record it is found that she was only a sprinter. For the month No. 19 gives 13s. 11d. more than No. 2, but for the year No. 2 gives £3 14s. 8d. more than No. 19. The one cow gave a big yield for a short period. The other did not give a big flow, but was a consistent milker, and came out best.

Cheapening Cost of Production.

If it costs £4 to produce 326 lbs. of butter with the best cow and the same amount to produce 122 lbs. of butter with the worst cow, then it has cost less than 3d. per lb. to produce butter from the good cow and almost 8d. per lb. with the bad one.

A Problem.

A herd that would give an average return of £7 3s. 5d. under such conditions, and in a year described by the oldest residents as the worst experienced for thirty years past, would be designated a picked herd. Therefore, this may be termed a picked herd, and if the individual members of a picked herd vary so much in the returns given by them, it would be most interesting to know to what extent the results of an average herd would differ when recorded in the same way.

Great Possibilities.

If such returns can be obtained under such adverse circumstances by an ordinary or mixed herd of cows in Victoria, what is it possible to secure from a herd, say, like the ten best cows in a favourable year? It is said that the average return from Victorian cows is 290 gallons —not equal to that of the worst cow here quoted. The ten best cows gave two and a quarter times that of the worst cow, so it can easily be seen what scope for improvement lies in this direction.

If it has been worth our while building up an industry of the magnitude—local and export—of £2,500,000 with the indifferent cows we are credited with, it will not be a hard matter to more than hold or own against all countries in the world if we pay more attention to the breeding, feeding and management of our cattle. To say that we are not making headway in this direction would not be true. In every district there are to be found a few up-to-date dairymen, who serve as splendid examples to the remainder, and who are ever ready to adopt improved methods. This system of recording the quantity of each cow's milk, together with the quality, is strongly recommended. The beginning is the hardest part of it. Give the plan a trial, and you will find the trouble and delay not nearly so much as it appears. In a short time it will become part of the routine of milking, and the information continually gained will far outweigh the little extra attention. What better technical education can be afforded the young people who usually do the milking; and what a splendid thing it is to know definitely which cows are worth keeping and breeding from.

Care of Dairy Utensils.

All cans and vessels of tin in which milk has been used should be rinsed out with cold water first, then washed with hot water, and afterwards scalded with boiling water or steam. If scalding water is used first, the albumen in the remaining milk sticks fast to the tin and renders the operation of cleansing most difficult.

Wooden vessels should receive almost the same treatment. Churns and butter-workers should have all the small particles of butter washed down with cold water after use, and then scrubbed and scalded. Should hot water be used first, the little waste atoms melt on the wood, and are sometimes liable to soak in.

If the wood is once allowed to become greasy in this manner it is almost impossible to again get it back into good working order. The frequent use of lime-water cannot be too strongly recommended for all milk and butter appliances, churns in particular. Many instances are known where contaminated vessels have caused hundreds of pounds worth of loss to the producers, therefore, proper attention should be bestowed on cleanliness to insure best results.

Purifying Water.

In the northern districts of the Colony it is the exception, rather than the rule, to have a supply of clean pure water suitable for washing butter. Mr. Pearson, Government Agricultural Chemist, explained a simple process of treatment for muddy or discoloured water, at the Conference of the Australasian Butter and Cheese Factories Managers' Association, May, 1897. Two tanks are used, one above the other. The upper one is used for the clarification of the water, and the lower one is for the reception of the clarified water. The top tank is fitted with a tap at the lowest point of the bottom. Let us suppose that 500 gallons of clear water are required for use each day ; then it will be necessary to have those two tanks of 500 gallons capacity each. Two vessels of any convenient size are necessary to contain a supply of soda and alum solutions ; also a watering can for measuring the liquid. Fifty gallons is a handy size for the former vessels. The alum solution is of such a strength that one measureful of it will convey to the 500-gallon tank 12 grains of alum per gallon, or 6,000 grains altogether. As there are 7,000 grains to the 1 lb. avoirdupois, that would be six-sevenths of a pound. If the measuring-can holds 1 gallon, then the amount of alum to be put into the 50-gallon vessel would be 43 lbs. That would be sufficient to last for 50 days. The amount of soda should be about 9 grains per gallon ; that is to say, the strength of the soda solution should be three-quarters that of the alum solution. Thus, if 43 lbs. of alum were put into 50 gallons, about 33 lbs. of soda should be dissolved in the other 50-gallon vessel. The process is simple. Fill the top tank with water in the afternoon. The measureful of alum solution is then evenly distributed over the surface of the water by means of the rose of the watering-can. The alum solution is then stirred into the water with a stirrer, this being done gently and carefully, so as not to get any air bubbles into the water. About ten minutes afterwards the measurement of soda solution is distributed through the water in the same way, stirring carefully as before. In the morning it will be found that the alumina has been entirely precipitated, and has settled on the bottom of the tank, carrying with it the solid impurities, including bacteria, from the water, and leaving the water in the tank absolutely clear and limpid. A siphon should then be carefully introduced, so as not to stir up the mud at the bottom, and the clear water should be removed into the lower tank, where, if required, it could be cooled for use when necessary.

Under the orifice of the siphon is a tin plate attached to the siphon pipe about 10in. or 12in. in diameter, which prevents the water from taking up with it as it passes into the siphon any sediment from the bottom of the tank.

When empty the top tank is sluiced out through the tap, and the whole operation is gone through as before.

Mr. Pearson states that this is an old-fashioned process, but recent investigations have shown that it is as efficient as any known process of purifying water. Alum used to the extent of from 12 to 20 grains per gallon has been found to result in complete sterilization of water. —that is to say, in the perfect removal of bacteria. Some who have seen this process at work have greatly admired the appearance of the water, but have expressed a fear that by using alum they would be introducing an injurious substance into the butter, in the manufacture of which the water was used. This fear is groundless, because, as already ex-

plained, the whole of the alumina is separated in the form of precipitate. It is, in fact, by virtue of this precipitation of the alum, and the conveyance in the precipitate of all the impurities, that the clarification takes place. But even supposing that a little of the alum were to be left in the water, a very simple calculation will show that the amount thereby introduced into the butter would be infinitesimal. The amount of water in butter is about 10 per cent., so that 1 cwt. of butter would contain about 11 lbs. (a little over 1 gallon) of water. As 1 gallon of water receives only 12 grains of alum, even if all the alum that was put in were to remain in the water, the amount conveyed to the butter would be not more than 13 grains to the cwt. As a matter of fact, even if only partial precipitation of the alum were to take place, there could be only 2 or 3 grains of alum left in a gallon of water, so that there would never be any fear of more than 2 or 3 grains of alum to the cwt. of water. It will be seen that those 2 or 3 grains of possible addition of alum are too insignificant to be considered.

When once the process is seen in operation it will be found so very simple and so very easy of application that it is unlikly that any one troubled with impure water would hesitate to adopt it.

RULES FOR MILK AND CREAM SUPPLY.

The quality of the butter made in this Colony largely depends on the care bestowed on the production and treatment of the milk and cream before being manufactured. In the interests of the dairying industry it is necessary for the producers to exercise every precaution to ensure the production of a first-class quality of butter. This fact is recognised by most dairymen, but there are some who do not give due attention to these matters.

It is to be regretted that it is not possible to deliver all the milk produced to the creameries and factories, and it is deplorable to find many who are within easy reach of a creamery or factory trying to separate the milk from their own cows and manufacture their butter in small lots.

Perhaps the worst results are obtained from cream separated on the farms and kept until too old before being delivered to the place of manufacture. The cause for complaint is not due to the use of small separators, but to the want of proper conveniences and accommodation, and, the lots being small, the necessary care is not given to the cream.

In our warm climate it is absolutely essential to have the aid of refrigeration at times of the year in order to make best butter.

In the absence of refrigeration the quality of the output is irregular, so, in order to attain and keep up uniformity, the milk should be delivered to where it can be treated in large quantities and manipulatd to best advantage.

With a view to encouraging an improvement on the existing conditions, the following rules have been suggested by the dairy experts connected with this Department as a guide to dairymen :—

Rules.

Care of Milk.

1st. The pastures, yards, and surroundings should be kept clean and free from carrion, and all decaying matter which may cause noxious smells.

2nd. Milk should be used and supplied only from healthy cows, which are fed on wholesome food, and have access to plenty of pure water.

3rd. In districts where sufficient salt is not naturally available a moderate allowance should be provided, as it adds to the health of the cattle and to the quality of the milk.

4th. Provide shelter for the cows against excessive heat and cold, and the flow and quality of the milk will be better.

5th. Be sure and make provision against the dry season by providing green

crops, in order to prolong the period of milking and maintain the health and condition of your cattle.

6th. Treat the cows kindly; milk them thoroughly and with regularity, that they may cultivate a milching habit.

7th. Milk should be drawn from the cows in a cleanly manner, the udders should be brushed or washed; milking with dry hands is preferable to the practice of dipping the fingers into the milk to moisten them.

8th. Immediately after the milk has been drawn from the cow it should be strained through a wire or cloth strainer.

9th. All buckets, cans, and other utensils with which the milk is brought into contact should be of tin; rusty vessels should be discarded.

10th. The milk vessels should be kept clean and sweet, and washed with cold or tepid water first, then scalded with boiling water, and finished with a rinsing of limewater; they should afterwards be drained out, sunned, and aired. Milk cans should not be left bottom upwards.

11th. The milk should be aerated, by dipping, pouring, or stirring, or by use of an acrator. After the milk has been aired it should be cooled quickly to as low a temperature as possible; and this should be done in a clean place, where there is no dust or smell.

12th. The milk should be kept in a place where the atmosphere is free from foul or injurious smells. Milk that is left without the shelter of some roof should be protected from sun and rain by placing the lid on the can upside down or by some other efficacious means.

13th. Every dairyman should have a thermometer, and know the difference between the temperature of the atmosphere and water; the cans of milk should be kept in the coolest place.

14th. The night and mornings' supply of milk should be kept in separate vessels, and may be mixed, when cooled to the same temperature, at the creamery or factory.

15th. "Biestings," or milk from newly-calved cows, should not be sent to the factory or creamery, nor separated till after the eighth milking. The milk of some such cows is not fit for butter-making for a much longer period, and should not be sent until it is in fit condition.

(Suppliers infringing this rule should incur a heavy penalty.)

16th. Each supplier should furnish pure sweet milk to which nothing has been added and from which no part has been removed.

17th. The factory or creamery manager should reject any milk which he considers unfit for use in the manufacture of the finest quality of butter, and his directors should assist in carrying out this recommendation.

Care of Cream.

18th. The cream should be cooled to as low a temperature as possible immediately after separating, and well stirred at least three times a day.

19th. The morning and night's cream should not be mixed till after each has reached the same temperature.

20th. The cream should be delivered to the factory daily in warm weather, in the coolest part of the day if possible, and at no time should it be kept at the dairy longer than two days.

21st. A little salt may be used in hot weather to assist in keeping the cream in good condition.

22nd. The cream cans should be covered from the sun in transit, and slip-lids used to prevent churning.

23rd. Use a "Babcock" milk-tester, and know exactly what each cow in your herd gives you per year; turn off the unprofitable cows and replace them with good ones.

If the foregoing rules are adhered to, the value of our products will be enhanced, and the profits of the milk producer increased.

Testing Milk for Factories, Creameries, and Milk Suppliers.

In case of disputes arising between milk suppliers and managers of butter factories and creameries regarding the percentage of butter fat contained in any supplier's milk the expert attached to the dairy section of the Department will test samples of milk free of cost by either visiting the factories or creameries, or receiving a sample of milk that has been collected by the "drip" system by the manager, and testing it in the Department's laboratory, Melborne.

Dairy farmers desirous of receiving instructions in the process of testing milk by the "Babcock" tester, by applying to the Secretary for Agriculture will be taught in Melbourne the proper method of using the appliances necessary for that purpose by the Department's experts.

LIST OF SHIPPING CHARGES FOR PRODUCE SHIPPED THROUGH THE DEPARTMENT OF AGRICULTURE.

Butter	per box, 2d.
Chickens	per pair, 5d.
Ducks	„ 5d.
Eggs	per dozen, 1d.
Geese	per pair, 9d.
Hares	per pair, 3d.
Mutton	per carcase, 8d.
Pork	„ 8d.
Rabbits	per pair, 2d.
Turkeys	„ 9d.

The above charges to be paid by the shipper or his agent, together with freight, &c., before obtaining delivery of bills of lading.

Mooi River Trout.

THE above represents a trout caught in the Mooi River near Rosetta, weighing 3¾ lbs., and in length 22 inches. Mr. Acutt states that the trout was caught, early in February last, by one of his coolies between two stones of the weir across the river, close to the Rosetta Railway Station. He has heard that three other trout have been similarly caught at the weir.

Veterinary Work at Uganda.

THE following report by Mr. Stordy, M.R.C.V.S., on veterinary work in British East Africa and Uganda Protectorate is published by order :—

TSETSE FLY DISEASE (NGANA).

The red line on the map prefixed shows the extent of the Tsetse Fly belt, a distance of roughly 90 miles.

The fly is migratory in tendeney, so that no well defined line on the map can be drawn, which could safely exclude the possibility of its presenee.

The fly, however, has never been loeated further inland than Muani (a halting station in the Kiu Hills on the old earavan route).

In my preliminary report on the causes whieh rendered the island of Mombasa uninhabitable for horses, I pointed out that an organism, the morphology of which was identical with that found in animals suffering from tsetse fly disease, was found in donkeys whieh had been working for some time on the island.

Whether the disease eaused was Surra or Ngana time would not permit me to judge, but I trust at no very distant date to be able to follow up my investigations at Mombasa.

It is useless to go into the details of the pathology, ete., of this disease — a disease which has been praetieally eradicated by the advent of the Uganda railway, with its exeellent serviee of horse boxes and fly proof gauze windows.

SOUTH AFRICAN HORSE SICKNESS (OEDEMEMYCOSIS).

This disease, so far as is known, is peculiar to Africa. It affeets horses, asses and mules.

It oecurs as a rule in low-lying parts of the country, where vegetation is abundant, and the ground below the undergrowth moist.

Animals whieh have suffered from the disease and subsequently reeover are spoken of as "salted," and are believed to be proteeted for the future.

Symptoms :—Paardziekte Form.—The symptoms in this form only present themselves at the onset of death.

An apparently healthy animal will show grave respiratory disturbances, heaving violently at the flanks, and within a very short time falling down, ejecting at the moment of death a eloud of foam from the nostrils and mouth.

This form of the disease has been the most eommon in Uganda.

Dikkop Ziekte Form.—In which the head and neek swell up.

Blauwtong Form.—In which the swelling is eonfined to the tongue.

Mueh yet remains to be learned of the pathology of horse-sickness, and I sincerely hope that a laboratory will be established in the East African Protectorate where investigations ean be carried out with a view to doing something towards the elueidation of this baneful malady.

The stables built at eaeh eamping place have done mueh to lessen the mortality from this disease.

RINDERPEST.

This disease has existed in the country for the last five or six years.

My reports, forwarded through Sir Harry Johnston, give full details of the work done by way of prevention and suppression.

So far no manifestation of this malady has been noted beyond the Gilgil river (10 miles inland from Naivasha), and it is to be hoped that the regulations now in foree will prove adequate in keeping the disease within its eireumseribed area.

I may add that bullock transport is now working from Nakuru railway station inland.

CONTAGIOUS PLEURO-PNEUMONIA.

This scourge broke out amongst our transport oxen at Nandi in September, 1898.

Tail inoculation was had reeourse to and isolation eamps formed. The results of the inoculation were entirely satisfaetory, and no renewed manifestation of the disease has sinee occurred.

Sheep-pox.

This disease broke out amongst the large Government flocks at the Eldama Ravine in June, 1900.

It was accountable for the deaths of several hundred head of sheep and goats.

I am glad to say, however, that with isolation and other methods the disease has been stamped out, and the road opened for the passage of sheep and goats.

I may add that the Masai helped me very considerably in my efforts to eradicate this disease.

Liver Fluke.

This parasite is ubiquitous in the two Protectorates, and must be the cause of a large mortality among the smaller ruminants.

Much could be done by draining and salting the swamps, to curtail this parasite's means of propagation and livelihood.

Malarial Fever.

A large number of cattle suffered from this affection when brought from the hot, low-lying country to the highlands, and deaths were not infrequent.

Large doses of quinine given per anum and hypodermically were found most beneficial.

Tuberculosis.

I am happy to state that no single case of this insidious disease has ever come under my notice during a three years' stay in the country.

In submitting the above report I may be permitted to urge the advisability of utilizing for purposes of transport an animal which is naturally immune against the ravages of the tsetse fly disease and horse sickness. I refer to the zebra, of which, as you are no doubt aware, there is an enormous number.

I am convinced that should the Government enter upon a scheme for its domestication, it would prove one of great value, and that at no very distant date a supply of animals would be available, not only for African service, but also for Army transport work at Home or in India.

The great difficulty so far has been the domestication of the adult animal. I have, however, to suggest the following plan for obtaining a possible way out of the difficulty.

I would propose that a kraal be formed within a district where firearms are non-existant, as in the case of a preserve. The kraal would have two extending arms leading from the open country into it, and would be constructed large enough to hold a herd of, say, 50 adult animals.

Several mounted Cape boys would be employed, whose duty, in the first instance, would be to accustom the zebras in the neighbourhood of the kraal to the sight of horses or mules.

If my anticipation prove correct, the zebras will in the course of a few days follow the horses or mules, and advantage could be taken of this to lead them into the kraal. If it were, however, found that they would not be led, it would be necessary to have them driven in by the Cape boys, assisted by swift-footed natives.

The animals being in this way confined within the kraal, they would naturally propagate their species.

It is with the offspring that I would propose that the experiment in the way of domesticity would begin. As is well known, it has been found nearly impossible to rear a zebra foal apart from its mother. I would not propose to separate them; they would live along with and be nurtured by their mothers.

A few months after birth the young animals could be caught, and by various ways become accustomed to the sight and presence of man.

I am very hopeful that in this way a number of young animals of both sexes would become domesticated, and prove useful for transport service, and also in propagating their species.

The second generation, if my experiment prove in any way successful, would be even more domesticated than their parents, and I am sure that in course of time a large supply of the domesticated zebra would be forthcoming for the future use of transport work at Home and abroad.

The initial cost might be a little more than the first results might justify, but there is no reason to doubt that in the long run the ultimate results would far more than compensate for the initial expenditure.

In conclusion I may be permitted to mention that on my return to Africa it will be my endeavour, as far as in my power, to improve the cattle of the country, by judicious selection of the best animals obtainable for breeding purposes.

Mangoes.

IN article No. 308 published in the issue of the "Bulletin" (Trinidad), for July, 1899, it was stated as follows :—

"There are several other mango trees in the garden which will probably prove worthy of record later when they have been sufficiently examined."

During the end of last season several mangoes were examined, and out of these seven have been selected for record, the figures and descriptions of which are now given. It has been thought advisable to import, once more, a number of selected varieties from the East, and to this end application was made to the Indian authorities for the best kinds from the various provinces, and cases of plants have been ordered from the Bombay, Bengal, and Madras presidencies. It is almost certain that we do not possess all the types of the various strains of mango grown in the East, and although our number of seedling varieties is legion, yet it is probable that the introduction of further East Indian kinds will be of great advantage in the endeavour to improve the strains now cultivated in the Western world.

The "Maud" Mango : A fine bold dark green mango, having a most delicious melting flesh, without fibre, and perfectly sweet. It is a seedling raised by the Honourable W. G. Gordon, and named in compliment to Mrs. Gordon. This mango must take its place amongst the best of our list.

Deux-Doux : This is a pretty little mango, and, as its name indicates, peculiarly sweet. It is one of those mangoes which the child needs no teaching to devour. It is one of those mangoes to cut which spoils it. It has a soft melting pulp, which will pass freely through a small hole made in the skin.

St. James' Mango : (Full size.) This is a seedling mango of peculiar form. It has a pronounced turpentine flavour, and a firm and rather fibrous sub-acid pulp, of a clean, light yellow colour. The colour of the fruit when ripe is a bright yellow. It could never be more than a second-class mango at its best.

Honey Mango : Dark green fruit, mottled yellow, with a slight purplish bloom. The flesh is soft and melting, very sweet, having a decided honey flavour. It has no trace of the turpentine taint so common among the mangoes.

The "Captain" Mango : This is a mango yellowish green spotted with yellow. The fruit has a decided mamillated point on the apex. The flesh is firm, without fibre, but with a decided turpentine flavour, which is more than covered by its extreme sweetness. This tree, though a larg one, fruited for the first time in 1899. Being so far unknown to us, it has been named the "Captain" to distinguish it from others.

The "Martin's" Mango : The Martin's mango was first seen in July, 1899, when samples were kindly sent on to the Gardens by the Honourable C. Leotaud. It is a pretty fruit, with a fine purplish bloom on the cheek, but in the main the colour is green, dotted with small yellow spots common to most mangoes. On first taste there may be detected a suspicion of the turpentine flavour, but this is rather agreeable than otherwise, and before the fruit is eaten is entirely for-

gotten in the sweet and luscious flavour which overcomes it in the mouth. The flesh is bright yellow, melting and rather meaty, with short fibre next the seed. This kind was received through the hands of French cultivators in Martinique.

Dr. De Boissiere's Mango: The following description is taken from a manuscript left by my predecessor, Mr. H. Prestoe, dated 15th July, 1869:—"Flesh Farinaceous fibrous, but very tender—strong mango flavour, with only a dash of the turpentine taint; bright orange colour outside as well as inside, round, full, and very succulent — a first-class mango — little liable to be attacked by rot or sourness."

Poultry Hints.

A GOOD laying hen will frequently lay her weight in eggs in six weeks.

If there is one thing that the hen louse despises it is kerosene oil; the smell of it makes them walk lively.

Give the chickens a good grass run and on clover if possible. Clover is a splendid feed for fowls of all ages, and the chicken that lives on clover will be the fowl that develops finely.

A breeding pen composed of hens three or four years old mated with an active young cock or cockerel, will produce more males from their eggs than a pen made up of pullets and mature cocks.

The dust-bath to the fowl is what the wash-bowl is to the individual. With the dust-bath the hen cleans her body. She uses it also for exercise. When a hen is incubating she comes off as regularly to dust herself as she does to feed, instinct teaching her that it is the best of methods for ridding herself of the vermin.

The Russian sunflower is one of the best foods known for giving a glossy tint to the plumage of fowls. When fitting your birds to exhibit, let it be included in the bill of fare. It is also an excellent egg-producing and healthful food for all kinds of poultry. The sunflower will do well on almost any kind of soil, and is often planted in out-of-the-way places to keep from view unsightly rubbish heaps.

There is nothing so much tends to the comfort and welfare of confined fowls as digging up their yards for them every two or three days. They just revel in the fresh dirt, and find besides many a tit-bit in the way of bug or worm.

In choosing your parent bird, just remember that the hen gives size and the male bird symmetry. The lack of this important bit of knowledge has led to much disappointment on the part of new beginners.

Care and food affect results to a great extent.

Breed from the best laying hens you have, and the stock will not disappoint you.

Grain food for fowls can be thrown on the ground, but soft foods should be fed on a board, or in a trough.

Never over-feed your poultry, or the supply of eggs will be reduced.

Introduce new blood if you wish to keep your stock vigorous and healthy.

An occasional meal of meat is useful during the moulting season. Boil it well before feeding it to the poultry.

Three essentials of a proper fowl house for winter are, to keep it light, warm, and dry.

In mixing pollard or other soft food, a little salt with it will be found beneficial.

Exercise is necessary to ensure the health of poultry.

Rain-making.

IN the "Queenslander" E. Morey writes:—The recent reports concerning the prevention of hail by means of the so-called "Stiger vortex," produced by the explosion of gunpowder in guns of special form, has renewed the discussion of the question of artificially producing rain. An elaborate series of

experiments in this direction was conducted in the dry inland region of the United States some years ago, but without useful result, beyond proving that rain making is not as yet to be a commercial process. Mr. E. Morey, writing to the "Colonist" on the "problem of future of our Western country," makes some interesting and valuable observations on the subject of rainfall. The importance of the matter makes it unnecessary to offer any excuse for reproducing his letter almost in full. Mr. Morey, who, it may be observed in passing, believes of the Western country that "drought is its normal condition, and rain a fortuitous event," says:—

The Press of late has given prominence to the question of rainfall as it affects the Western area of our State; and the many authentic reports of the desert condition to which vast areas are reduced by continued drought is full justification for the Press to place before its readers the reports or views of those who have practical knowledge of the Western interior. For it may be that by further ventilation of this most important matter a means may, some day, be found to modify its climate; that is, under certain atmospheric conditions, generally marked in character, during drought. The writer, after a silence of thirty-four years, is induced to take pen in hand again since reading a long and earnest letter in the "Courier" of the 26th January, signed "D. MacGregor, Durham Downs."

Having knowledge of the desert conditions of the interior of Australia for more than fifty years, I am of opinion that no State laws, however liberal, can save venturesome holders of that great area of country from recurring loss or ruin. And I am of opinion that the State should take action and learn, if possible, whether, during drought, and under certain conditions of the atmosphere commonly arising during drought, it may be practicable to cause the clouds to condense and drop their moisture. This is a question again attracting the attention of scientists, and experiments are going on, though Professor Boys and Lord Kelvin consider nothing will come of the present experiments. But it does not follow that it is absolutely impracticable to compel masses of cloud charged with moisture to dry their fatness. That cloudland may be brought under control we have proof from Mr. Wragge's recent interesting letters, for in Styria and other countries it is now found practicable to bombard the clouds —under certain conditions—to prevent the formation of hail, and thus save great annual losses to vignerons. Doubtless this knowledge will be availed of in Australia, where vineyards are established, but the problem with us is not to disperse raineloud, but to compel them to give off their moisture. The problem is this: During great droughts heavy masses of clouds roll up from the south-west, and sometimes for days together; they rise wall like and of inky blackness, and gradually occupy half the horizon and rise to the zenith. The air is close, and so still that not a leaf stirs, nor does a bird venture on the wing. An ominous calm reigns, causing the inexperienced to believe that a great storm is imminent, and that the parched and gaping earth is about to be revived. Soon, alas! a faint puff of air comes from the south-west horizon, where a growing light shows in the sombre cloud masses, and within an hour a strong wind rages, driving the clouds on either side and dispersing them. The night will be cool, cloudless, and so clear that the stars shine as in winter time. I have known this tantalising phenomena recur for ten successive days, and give not one drop of moisture. Now, are these vast cloud masses charged with moisture? If so, why do not they condense and discharge it? During a good season a little cloud "no bigger than a man's hand" soon gathers to itself much more, and rain falls, even in our Western regions. What is lacking, during drought, in such cloud masses as I have described? And is it possible for man to supply that want? or to set up such mechanical or other conditions as will bring fruition to our longings. Mr. Wragge must be aware of our deplorable state out West, a condition of affairs so widespread and disastrous as to be of national concern; and it may be he has or will direct the attention of European scientists to the problem. Should he not

do this, will the State take action, and cause this momentous matter to be enquired into? In this hope, and to this end, I have ventured to reopen the question—one that had my attention thirty-four years ago, when I addressed a letter, through the Sydney Press, to an old friend, the late T. S. Mort, on this subject. Nothing, however, came of it. That letter I have still, and should you consider its publication likely to attract attention, I now forward it.

Following is the letter referred to. (Originally written about the beginning of 1868):—My dear Mort,—In a late number of my "Sydney Mail," I found a letter under your signature on the subject of the meat supply of New South Wales, and suggesting a means for making butchers' meat cheap. This is a subject that has occupied my attention also, though from a different point of view to yours, and one that may perhaps be looked on at present as impracticable and even visionary. In this letter I shall not advert to your views further than to say, I do not think your suggestions relative to the manner runs should be dealt with by the Government would be successful in the purely squatting districts, for the climate there is too uncertain to give small holders — of 1,500 sheep on a limited area — as you propose, a chance of success. Water may be found by sinking, or even stored by dams, but during drought vegetation is all but extinct, and on small areas, which are sure to be heavily stocked, there would be no outlet, and ruin would fall on the holders. But your suggestion would be a good one if the "craze," as some of my own friends call it. I now entertain could be realised, that is to say, if our climate could be modified. On this subject I have written several letters to the Press, in the hope of attracting the attention of scientists, men more capable than I am of studying this question, and forming a valuable opinion. The question asked was, can the rain-charged clouds be compelled to give down their moistures under the following conditions. (Here I give you a copy of one paragraph of a published letter of mine.) "One of the peculiarities and aggravations of this climate is the frequent threatenings of rains and storms, and the infrequency of either. Only last night the heavens were covered with a thick pall of clouds, just such a sky as one sees in 'Poussin's' painting of the Deluge, and we all expected a grand rain. Even the working hands, not usually demonstrative on the subject of weather, rubbed their hands and expressed satisfaction at the threatened discharge. Bareheaded I sat, out in the darkness, hoping to cool my head with a rain bath, and treat myself to the unaccustomed luxury of the feel of moisture. I sat waiting in vain. Instead of the pleasing rain a blinding storm of dust arose, filling eyes and ears, penetrating everywhere, and irritating my epidermis greatly. The great mass of cloud seemed to divide just overhead, and to be drawn asunder as one would draw aside a great curtain, giving one the idea of the 'Prince of the powers of the air' taking a malicious pleasure in offering us the cup and then dashing it from our lips. We poor devils must surely be the descendants from, and inheritors of, the punishment accorded to Tantalus." Besides the letters to the Press I wrote fully to Mr. W. H. Walsh, one of our Ministry, treating this matter of our rainfall and of our meat supply, from a national point of view. I suggested that the Ministry should instruct our Agent-General, Mr. Daintree, to try and obtain the opinion of one or more scientific men, who are sure to be gathered at the coming Vienna Exhibition, as to the "possibility of making the clouds drop their moisture." I thought Mr. Daintree would enjoy peculiar facilities for mooting such a question at the Exhibition, for one of the great divisions of exhibits is "food products," and in the present day much attention is always directed to this subject. I have dwelt on the disinclination of capitalists to invest money in our western lands on account of the arid and uncertain climate, and so forth, but my appeal to Mr. Walsh was in vain, and I received a hint not to bother him with any visionary ideas. So I turn to you, for you have a far larger circle of acquaintances, and more influence than I have, and you may find an opportunity of putting this question of "modifying climate" before those who could give a weighty reply. The data to submit for consideration are, briefly, as

follows:—(1) The daily gathering of vast masses of inky clouds rising slowly from the south-west and up to the zenith with an ominous stillness, as if a great storm must burst forth ; next a great puff of air from the centre of the mass, which rapidly becomes stronger, and within an hour breaks up and disperses every particle of cloud. (2) This threatening of rain and storm taking place about 4 to 5 o'clock of an afternoon, sometimes for six or eight days in succession, and occurring only during dry seasons. And the questions submitted on the above data, are:—(1) Why do these great rain-bearing clouds not condense their moistures ? (2) What is wanting in the conditions of the atmosphere during dry seasons — under the circumstances related above — as compared with the conditions of the atmosphere during wet seasons, when small gatherings of clouds give down copious rains ? (3) Is man likely to find a remedy ? and, lastly, if so, the possible or probable form of it ? We may look on this matter as of national importance, and all squatters would gladly tax themselves to provide a fund or bonus for the solution of this great problem ; this should be made known. And I think a solution will some day be found, because in all that relates to man's occupation of the earth, no insuperable bar has yet been met, for when one great step in advance is gained — such as steam travel — fresh possibilities thus open to view, and fresh triumphs are won in the successful occupation of the world. And why not in the regions of the air as well as on the land ? My belief is the human race is only on the threshold of the occupation of the earth, and that in a not remote future no great area of the earth's surface will be unoccupied by reason of extreme of climates. Yes, the time will come when the present waste places, now so vast, will be the homes of countless millions of civilised men — when even the burst-up, sun-blasted wastes of Australia will support their share of humanity, and it will be felt that an active life — if a just one — is the truest form of worship of that Being who gives us the earth to subdue.

What a revolutionising of Australian squatting affairs would be brought about by the possession of means of drawing rain from the clouds ; and what possibilities of supplying the old country with our meats in bulk, the scheme you are now intent on. Let me hear from you some day about my craze.

A Creamery Bye-Product.

THE following is taken from "Chambers' Journal" :—Many new industries have been developed in the British Isles at the close of the last century. One of the most novel had its birth in the vicinity of Buckingham — namely, that of the manufacture from the milk of creameries, after the butter has been extracted, of a substance known by the highly classical name of plasmon. This substance takes its name from the Greek, meaning "that which gives form."

The fresh milk as it comes from the cow is put into a separator, all the cream being removed by this method. The separated milk is afterwards treated so as to coagulate all the proteids of the milk ; and this coagulated mass is then kneaded and dried at a temperature of seventy degrees centigrade under an atmosphere of carbonic acid gas. When perfectly free from moisture the plasmon is ground into a granular powder, which is completely soluble in hot water.

As an article of commerce this substance has a great future before it, and it opens up a fine field for the farmer or dairy-keeper to get rid of the separated milk.

The process of manufacture is an expensive, though very rapid, one ; special machinery having to be got from Germany, as the substance was originally prepared there by a well-known chemist named Siebold.

As to the economic value of plasmon there can be no doubt when it is known that the German Government supply it

in very large quantities to the army and navy. As a portable, concentrated nutrient, according to the German Government Department for the Investigation of Food-stuffs for the Troops, it has been found that one ounce of this powder is equal in nourishing and sustaining properties to three and a quarter pounds of the finest beef-steak, or to about ten or twelve pints of milk.

A food-stuff of such high nutrient value ought to supply a long-felt want in the way of emergency rations for "Tommy Atkins" when on active service. If it could be had in the form of a tablet, the soldier could carry quite a good square meal in his haversack. It has been used at the front with very marked success in feeding the typhoid patients.

One class of society ought to hail with triumph the advent of this new product, as it will make up the oft-bemoaned lack of albumen in their staple articles of diet—vegetables. It is neither fish, flesh, nor fowl, and thus comes as a god-send to the poor vegetarian.

Plasmon will also prove of the highest economic value in the carrying out of the open-air treatment of consumption. It ought to form a most valuable article of diet for such cases, as from its composition it consists of the elements which go to build up a healthy frame, able to withstand the ravages of microbes of all kinds. One newspaper in London spoke of it as the "magic food." How far that is true cannot at present be estimated; but there is no doubt that a food such as this will provide an excellent diet for those who have to undergo great muscular strain, such as cyclists and athletes. It has proved of the greatest value in racing and stud stables. It does not put on fat, but flesh, and renders the muscles hard and firm. At present this new food is used in one of the leading training-stables with marked success.

From observations made by the writer, plasmon forms one of the most ideal foods for treating, or rather dieting, persons inclined to be of a corpulent nature, being admirably adapted for carrying out the Salisbury or Banting treatment of obesity, by giving a rich nitrogenous aliment to set up a healthy metabolism of the fat-cells, with the proportionate increase of hard, firm muscular tissue.

[The address of the Plasmon syndicate is, The International Plasmon, Limited, 56, Duke Street, Grosvenor Square, London, W.]

Acclimatization of Trout in Natal.

REPORT BY DR. GILCHRIST, BIOLOGIST TO THE CAPE GOVERNMENT.

To the Under Secretary of Agriculture, Capetown.

SIR,—I have the honour to submit the following report, which, at the request of the Government of the Colony of Natal, and in accordance with your instructions, I have drawn up, on the condition of the Trout lately introduced into the rivers of Natal.

The time at my disposal being so limited it was impossible to make an adequate examination, and this is to be kept in view in considering the conclusions I have arrived at and any recommendations I make.

On the 28th February, I proceeded, with Mr. Parker, to the upper part of the Umgeni, on Mr. Ross' farm, and examined the river during the afternoon of that day and forenoon of the following.

This part of the Umgeni is an ideal trout stream, with an abundant supply of fish food in the form of insects, larvae, etc. There appears to be no other species of fish in the river except a small barbel, which does not appear to grow to a large size, and which will, therefore, doubtless afford excellent food for the larger fish. There seems to be an entire absence of other fish which would compete with the trout, the "scale fish" (probably Barbus capensis) occurring only down the river.

During the five or six hours' fishing, about a dozen fish were caught by two rods. The largest of these was about one pound weight, three or four about three-quarters of a pound, some half a pound, and the remainder, which were returned to the river, only a few inches in length.

It would appear from this that the stream is by no means over-stocked. The weather, however, was not altogether favourable

for fishing, and I was assured by Messrs. Parker and Soutar, who have an intimate knowledge of the waters, that they could occasionally be caught in large quantities. The small number caught might thus be accounted for, but I am convinced that there is not yet more fish in the river than can be provided for, and should therefore recommend that the work of stocking be continued. It might have been advisable to have restricted public fishing somewhat at an earlier date, but, although I am of opinion that the rivers have been opened somewhat prematurely for this purpose, it may not be expedient to withdraw the privilege now. I recommend, however, that portions of the river opened should not be extended in the immediate future. They might, indeed, with advantage be curtailed, say to part of the Umgeni alone.

The question as to why the trout are not found in the lower reaches of the river may be explained in view of this. The abundance of food and the absence of competitors render the part of the river examined a very favourable locality for trout, and they will probably not move out of this unless compelled to do so. The cooler waters of the upper reaches of the river will also probably be preferred by the trout until they become thoroughly acclimatized, as these conditions more resemble those found in Europe.

It would be instructive to examine the other parts of the river with respect to food supply, temperature, etc., and compare them with those in the parts occupied by the trout. There can be little doubt, however, that those parts in which other fish (such as "scale" fish) occur, cannot be so favourable for trout, not that these other fish may do direct injury to the adult or young trout, but they will doubtless compete with them for food. It should be ascertained accurately what other fish are in the rivers, and upon what they feed.

On examining a few of the fish I found the ovaries in a fair state of development, and probably in about three months the ova would be mature. The present close season seems therefore to be correct, as it would include the spawning season, and also a few months after it, during which the fish would be in poor condition.

With regard to the condition of the fish themselves, I can assert with confidence that those I saw caught were in no respect inferior to the European form. They were well shaped and fully formed, lively and active in their movements. Whether this is true of larger and older individuals I had unfortunately no opportunity of judging.

Viewing the acclimatisation of trout in Natal as a whole, the enterprise seems to have been remarkably successful, especially in view of the intermittent and not over abundant supply of ova. Great credit is due to those who have succeeded in overcoming the initial difficulties, and the Government has been particularly fortunate in securing the voluntary services of Mr. Parker in this most important work.

Generally speaking, I should say that there has, perhaps, been too little work done in the stocking of the rivers with fry and ova, and that they had been open to public fishing somewhat too soon. In natural conditions there is normally progeny sufficient only to keep up a definite stock in the river, and it is evident that there is not enough of a surplus to meet the demands of the fishers, and also to quickly stock the many miles of new waters. This will be more apparent when we consider the many rivers of Europe and America where the stock can only be kept up to an adequate amount by continued artificial propagation.

As to the actual means of stocking in Natal, it is desirable to have a hatching establishment with a stock of breeding fish in ponds, with occasional introduction of ova from elsewhere. This could be done at an expense of £500 a year. An alternative to this is the importation of ova from Europe or Capetown.

The percentage of loss, however, in the former case has been found to be so high that it seems more feasible to procure ova from the hatcheries in Cape Colony, and it appears highly desirable that some scheme of co-operation should be devised to the mutual advantage of Natal and the Cape.

I have the honour to be, Sir,

Your obedient Servant,

J. D. F. GILCHRIST,
Government Biologist.

Capetown, 11th April, 1901.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inanda & Ndwedwe	Lungsickness	H. Gillespie ...	Avoca.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein.
		,,	W. Ralfe ..	Ennersdale.
		,,	F. R. Moor ...	Greystone.
		Lungsickness	J. T. Howell ...	Doornkop.
		,,	Joeisa ...	Klipfontein.
		,,	Toonvani ..	Chieveley.
		,,	A. & W. M. Henderson ...	Elands Park.
J. Button ...	Estcourt, South of Bushman's River	,,	J. Mattison ...	Klipstone.
		Scab	C. P. F. Marais ...	Stockton.
		,,	H. E. Kirby ...	Klipfontein.
		,,	A. Lawrance ...	Grantly.
		,,	W. S. Crart ...	Springvale.
		,,	H J. Hurd ...	Weston T'Lands
		,,	J. W. Haw ...	Woodleigh.
A. H. Ball ...	Weenen ...	,,	C. P. F. Van Rooyen	Mona.
		,,	G. R. Van Rooyen	Vitooria.
		,,	R. J. J. Van Rooyen	Bird Spruit.
		,,	,, ,,	Doornkloof.
		,,	L. J. Lotter ..	Waterfall.
		Lungsickness	Secwa... ...	Baviaan's Krantz.
J J. Hodson ...	Lion's River ...	Scab	Jas. Morton ...	Tweedie Hall.
		,,	H. Stedman ...	Woodlands.
		,,	C. Strapp ...	Oatlands.
		,,	G. Woodhouse ...	Haliwell.
		,,	Jas. Ross ...	Gowrie.
		,,	A. S. Parkinson ...	Shafton Grange.
		,,	D. McKenzie ...	Cotswold.
		Lungsickness	A. Clark & Natives	Mount Ashley.
E. J. B. Hosking ...	Upper Umkomanzi	,,	H. Gillespie ...	Intimbankulu.
		,,	Native ...	Stirtreamfontein.
		,,	Turnbull & Co. ...	Glen Islay.
R. J. Raw ..	Impendhle ...	Scab	G. Q. Hamilton ...	Ivanhoe.
		,,	J. W. Brooke ...	Impendhle Store.
		,,	D. Tootell ...	Kimberley.
		,,	R. Gresham ...	Castle Howard.
		Lungsickness	Donga ...	Johnstone.
W. Wilson ...	Polela	,,	H. Eaglestone ...	Coleford and The Bungalow.
		Scab	H. Nicholson ...	Fondling.
		,,	A. W. Leggatt ...	Selbourne.
C. E. Hancock ...	Ixopo ...	Lungsickness	J. H. Johnson and Natives	Dronk Vlei.
		,,	W. W. Walton & Natives ...	Dronk Vlei.
		Scab	Native Pietman ...	Wesley.
		,,	C. L. Hammond ...	Sunrise.
		,,	W. K. Anderson...	Maxwell.
		,,	E. S. Clarke ...	Carr End.
		,,	Malambula ...	Location.
		,,	Qinisani ...	Klipgat.
		,,	Solibamba ...	Lutafa.
		,,	R. Kennedy ...	Cornhill.
		,,	G. Thomson ...	Cromwell.
		,,	A. Watson ...	Rosehill.
		,,	Archibald & Co. ...	High Flats.
		,,	W. Gray ...	Helmsley.
		,,	Momololo ...	Umgodi.
J. F. Bernard ..	Newcastle	Lungsickness	A. A. Osborn ...	The Mount.
		,,	Native Shallos ...	River View, Ingogo.
		,,	H. P. Beare ...	Glen Hesit, Ingogo.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle	Lungsickness	G. L. Fraser ...	Ingogo.
		,,	J. F. Grant ...	Hilldrop.
		,,	H. S. Dicks & Sons	The Retreat
		,,	Native Funwayo...	Tigerkloof.
		,,	Umbobo & Lugudu	The Garden.
		,,	Umgodini ...	J. Adendorff's farm Ingagane.
		,,	Kotshaindoda ...	N. Dugenaar's farm, Ingagane.
		,,	J. W. O'Reilly, Natives Jonas, and Paplana	Newcastle T'Lands.
		,,	L. H. S. Jones ...	,,
		,,	J. Hodgson ...	Belvedere.
		,,	Bob. Salugwanda	Boschhoek.
		,,	A. Nottman ...	,,
		,,	P. L. Uys ...	Jackalspan.
		,,	T. Breary ...	Newcastle Colliery.
		,,	J. Davidson ...	Lennoxton.
		,,	A. Danks & Fox...	Crown Colliery. Newcastle.
		,,	Beckeroo ...	Lennoxton.
		,,	J. Smith ...	,,
		,,	— Sheikamier ...	Newcastle.
		,,	J. J. Exsteen ...	Manning.
		,,	A. Paine ...	Mount Prospect
		,,	F. W. Hatley ...	,,
		,,	E. Parker ...	,,
		,,	Ramsaroop ...	Newcastle.
		,,	G. J. Way ...	Vrede.
		,,	Unjopal & Eseresing	Newcastle.
		,,	A. H. Tatham ...	,,
		,,	J. W. James ...	,,
		,,	G. Brown ...	Wykom.
		,,	Macdonald & Kemp	Lennoxton.
		,,	Natives ...	Whykombe.
		,,	,, ...	Droog Plaats.
		,,	J. Pettigrew ...	Newcastle T'Lands.
		,,	A. Krause ...	Filexton.
		,,	G. W. Nourse ...	Rutti & Highton.
		,,	Simeon Ndhlovu	Freda.
		,,	— Hodgson ...	Newcastle T'Lands
		,,	S. W. Reynolds ...	,,
		,,	O. Olver ...	,,
		,,	D. S. Redman ...	Snipe Marsh.
		,,	R. T. H. Harrison	Lennoxtown.
		,,	F. Ferrier ...	Henley Farm.
		,,	G. W. White ...	Ruth.
		,,	C. R. Savory ...	Pomeroy and Evin.
		,,	Dr. Ormond ...	Ingogo.
		,,	Seikomya Datuz	Newcastle T'Lands.
		,,	Loxton & Rudd	Waterfall.
		,,	L. C. Koch ...	Kabbaslaagte.
		,,	D. Miller ...	Roseless
		,,	H. Singleton ...	,,
		,,	E. Graham ...	,,
		,,	Cooper & Chandley	Newcastle T'Lands.
		,,	Blizzard & Pratt	Ingogo.
		,,	J. W. A. Welsh ...	Paradise.
		,,	— Hanstin ...	Wykom.
		,,	J. G. Kemp ...	Heighton.
		,,	G. Star ...	Lennoxton.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	G. Wood ...	Heron's Court.
		,,	W. L. Lea ...	Lennoxton.
		,,	J. Mortimer ...	Try Again.
		,,	P. W. Dept. ...	Newcastle T'Lands
		,,	S. Loxton ...	Lennoxton.
		,,	D. Dewar ...	Newcastle T'Lands.
		,,	W. A. Ross ...	,,
		,,	Nehorasing ...	,,
		,,	— Roberts ...	,,
		,,	C. Watson ...	River Bend.
		,,	H. James ...	Kalbaslaagte.
		,,	J. R. Watt ...	Horn River.
		,,	G. Matthews ...	Shakespeare.
		,,	H. Loxton ...	Lennoxton
		,,	A. & S. J. James...	Paradise.
		,,	Natives ...	Hope Farm.
		,,	— Flemming ...	Newcastle T' Lands.
		,,	Vinnecombe & Robson ...	Lennoxton.
		,,	W. R. Bowes ...	Endsell.
		,,	F. Watson ...	Greenwich and Mountain View.
		,,	G. E. Jubber ...	Brackfontein.
		,,	Digeto ...	Rooi Point.
		,,	J. E. Calf ...	Chelmsford.
			R. Dann ...	Yarl.
		,,	W. L. Oldacre ...	Nil Desperandum.
		,,	A. J. Crawford ...	Newcastle T'Lands.
		,,	C. Collyer ...	Stilazie's Kop.
		Scab	C. de Wet ...	Schuinshoogte.
		,,	H. S. Dicks ...	Lennoxton.
		,,	A. J. Middleton ...	Ingogo.
		,,	W. E. Few ...	,,
		,,	F. Johnstone ...	Craig.
		,,	Umkwenesi ...	Alcock's Spruit.
		,,	J. Dicks ...	Vet Klip.
		,,	F. R. Tewson ...	Rooi Point.
		,,	W. A. Lang ...	La Belle Esperance.
		,,	J. Vanderwesthuise	Hartebeestelaagte.
		,,	W. C. F. Napier ...	Eagles Cliff.
		,,	J. A. Vanderplank	,,
		,,	A. P. de Jager ...	One Tree Hill.
		,,	G. J. Way ...	Vrede.
		,,	J. W. O'Reilly ...	Gordon.
		,,	H. P. Beare ...	Ingogo.
		,,	J. Matthews ...	Shakespeare.
		,,	O. Schwikkard ...	Boscabelli.
		,,	G. Star ...	Lennoxton.
		,,	R. S. Miller ...	Goloch.
		,,	W. C. F. Napier...	Newcastle T'Lands.
		,	C. G. Palmer ...	Dry Cut.
		,,	P. L. Uys ...	Jackalspan.
		,,	W. Dicks ...	Hope Vale.
		,,	S. J. James ...	Stafford.
		,,	J. W. Shuttleworth	Duck Ponds.
		,,	S. W. Reynolds...	Newcastle T'Lands.
		,,	W. L. Jee ...	Lennoxton.
		,,	J. Davidson ...	,,
		,,	A. J. Debenham...	Knowsley.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. S. Parkinson ...	New Hanover ..	Lungsickness	E. Bentley ...	York.
		,,	E. Boast ...	The Avenue, York
A. Hair	Umgeni and Borough of Pietermaritzburg	,,	T. Dawson ...	Zwartkop.
		,,	C. Oldfield ...	Wilgefontein.
		,,	H. H. S. Moreland	Maudstene.
		,,	W. Oldfield, Natives	Ambleton.
		,,	Jonas	Slangspruit.
		,,	Discharged Transport Cattle	Matowan's Kop.
J. Chaplin ...	Klip River	,,	W. J. Tully ...	Grobelar's Kloof.
		,,	A. H. Spring ...	Reserve.
		,,	W. Cochrane ...	Aller Park.
		,,	A. Armstrong ...	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ...	Grobblar's Kloof.
		,,	Natives ...	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,,	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	J. A. de Waal ...	Blau Bank.
		,,	J. P. Buys ...	Reit Kuil
		,,	Pepworth & Reid	Reitfontein
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein
		,,	Natives ...	Weltervreden
		,,	J. Peniston ...	Reserve
		,,	W. M. Tollner ...	Weltervreden
		,,	J. Van Whye ...	Ladysmith T'Lands
		,,	G. J. Heslop ...	,,
		,,	H. E. K. Anderson	Gedula.
		,,	J. F. Rethman ...	Georgina.
		,,	Natives ..	Reit Kuil.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	G. F. & J. Woodhouse	Davel's Hoek.
		,,	Natives ...	Georgina.
		,,	,, ...	Zwaart Kloof.
		,,	G. J. McDuling .	Waterford.
		,,	Natives ...	Langverwatht.
		,,	,,	Vertrek.
		,,	Nondo Gama ...	F. J. Dewaals' farm
		Scab	J. H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson ...	Walker's Hoek.
		,,	C. Crawley ..	Waterloo.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	G. M. Rudolph ...	Reit Kuil.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	J. G. Nel	Femie's Kraal.
		,,	G. Wetherill ...	Walker's Hoek.
		,,	C. B. Lloyd ...	Klip Poort.
		,,	A. C. Beyers ...	Vaal Krantz.
		,,	A. Krogman ...	Brakfontein.
		,,	M. W. Krogman...	Dreifontein.
		,,	P. Marais ...	,,
		,,	H. Boers ...	Dew Drop.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Scab	G. Spearman ...	Feir View.
		,,	A. C. Harding ...	Waterford.
		,,	J. Van Reenen ...	Wessel's Nek.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	-- Spence ...	Reunion Estate.
W. Freer ...	Upper Tugela ...	,,	H. F. Pearson ...	Everton.
		,,	J. W. Coventry ..	Rangeworthy.
		,,	D. Munger ...	Bedale.
		,,	Mr. and Mrs. C. C. J. Bester	Bester's Hoek.
		,,	W. Freer ...	Acton Homes.
		,,	W. O. Coventry ...	Acton Homes.
		,,	H. Francis ...	Bedale.
		,,	G. Spearman ...	,,
		,,	G. H. H. Coventry and Native	Rangeworthy.
		,,	G Spearman ...	Spion Kop.
		,,	F. Zunkel ...	Klein Waterfall.
		,,	T. H. Creevin ...	,,
		,,	Dr. Jones ...	,,
		,,	D. G. Giles ...	Upper Tugela Magistracy.
		,,	J. Reed ...	Roode Bent.
		,,	Borbasee ...	Vrom Draai.
		,,	S. Sharratt ...	Klein Waterfall.
		,	Natives ...	Green Point.
		Scab	J. Scheepers ...	Sand Drift.
		,,	C. Crawley ...	Waterloo.
		,,	G. H. H. Coventry	Rangeworthy.
G. Gielink ...	Zululand ...	Lungsickness	M. Titlestad ...	Ntingwe.
		,,	Dinizulu ...	Hlabisa District.
		,,	Noiwana ..	Nqutu.
		,,	Natives' Cattle ...	Melmoth.
		,,	Sebambindoda and Natives ...	Kwamagwaza.
		,,	G. Havemann ...	Insuzi.
		,,	Military Loot Cattle	Warbeck, Elizabeth, and Barneveld Melmoth.
		,,	Damusa ...	near Melmoth.
		,,	Ndabazeywana ...	Nqutu.
		,,	Strachan ...	,,
		,,	Jacob ...	Vant's Drift.
		,,	M Bube ...	,,
		,,	Surrendered Boers	Hlabisa.
		,,	Lufahla Usutu ...	Nqutu.
		,,	F. W. White ...	Melmoth.
		,,	Havermann	Ukandhla.
		,,	J. G. Vanderwesthuyse	
		,,	G. Muller ...	Near Melmoth.
		Scab.	H. T. James ...	Prospect.
A. Klingenberg ...	Umsinga ...	Lungsickness	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
		,,	Combrink Bros. ...	Uithoek.
		,,	Mrs. H. Strydom...	,,
		,,	Ngobazane ...	Vermaak's Kraal.
		,,	Usiquantjee ...	Emsita.
		,,	James Fuli ...	Umsinga Location.
		,,	A. Müller ...	Pression and Buffalo Home.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. Klingenberg ...	Umsinga ...	Lungsickness	M. Shebele ...	Freiburg.
		,,	Dr. J. Dalzell ...	Gordon Memorial M.S.
		,,		
		,,	H. Steyn ...	Craigneathen.
		,,	H. Dedekind ...	Buffalo Home.
		,,	T. Keyter	
		,,	T. Crooks	Pomeroy Town Lands.
		,,	Botha	
		,,	Westbrook Bros.	
A. J. Marshall ..	Dundee ...	,,	Marshall Bros. ...	Cleveland.
		,,	— Dammann ...	Celle.
		,,	— Frockling ...	Henning.
		,,	W. Muller and C. Hellberg	Karlsburse.
		,,	— Schroeder ...	Schroeder's Hope.
		,,	do. ...	Rosenen.
		,,	— Haynes ...	Sterkstroom.
		,,	Military Authorities	Maypole.
		,,	A. F. Henderson...	Brazil.
		,,	— Stoffel ...	,,
		,,	— Ohlsen ...	Craigside.
		,,	Umquayo ...	Sweet Home.
		,,	Glutz ...	Rocky Glen.
		,,	Thorn ...	,,
		,,	D. Oppermann ...	Gedull No. 2.
		,,	— Botha ...	Jackalsfontein.
		,,	Cooper & Umbleby	Dundee.
		,,	Redman ...	,,
		,,	Natives ...	Craigieburn.
		,,	Cooper & Umbleby	Domain.
		,,	A. A. Smith ...	Dundee
		,,	Redman & Nourse	Craigside.
		,,	J. Landman ...	Boschfontein.
		,,	J. Davidson ...	Beacon Hill.
		,,	Natives	Long Land.
		Scab	—Hearn ...	Hatting Spruit.
		,,	J. W. Marshall ...	East Lynn.
		,,	— Ohlsen ...	East Lynn.
		,,	D. Meumann ...	Dundee.
		,,	A. & P. Conyers ...	Rest.
		,,	Natives Sheep' ...	Maypole.
		,,	W. Stafford ...	Sutherland.
W. A. Hutchinson	Alfred ...	,,	Nqubu ...	Location.
		,,	Ngihla ...	St. Mary's.
		,,	Mpapu ...	Location.
		,,	Camulana ...	,,
		,,	Manxolo ...	,,
		,,	Faku ...	Mount Alice.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	A. C. Beyers & Sons	Doveton.
		,,		
		,,	Natives ...	Hungerspoort.
		Scab	H. L. Francis ...	Rietfontein.
		,,	J. Lawford ..	Emmadale.
		,,	G. Spearman ..	Woodlands.
		,,	J. H. Beyers ...	Doveton.
		,,	L. M. J. Nel ...	Schikhoek.
E, Varty ...	Umvoti—Western Portion	,,	Bros. P. R. & G. H. Nel	Wonderboom.
		,,	W. Slatter ...	Holme Lacy.
		,,	H. Hansmeyer ...	On Rust.
		,,	L. J. Nel ...	Welgegund.
G. N. Perfect ...	Umvoti—Eastern Portion	Scab	J. A. Nel ...	,,
		,,		

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand have been proclaimed by the Governor an infected area under the Lungsickness Act.

M. J. HIME,
for P. V. Surgeon.

Principal Veterinary Surgeon's Office,
22nd May, 1901.

The Agricultural Journal

AND MINING RECORD.

VOL. IV. FRIDAY, JUNE 7, 1901. No. 7.

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CONTENTS.

Horsesickness Investigations.

By H. WATKINS-PITCHFORD, F.R.C.V.S.

(*Continued.*)

THE theory has been advanced that the disease is contracted by the direct inhalation of spores of the organism.

One South African investigator holds the view of these spores being transferred by winds at high altitudes and subsequently inhaled upon precipitation. The difficulties in the way of the acceptance of such a theory are obvious, but certain conditions favouring the existence of fungoid growths are also favourable to the outbreak or continuance of the disease.

Mushrooms and other fungi are known to spring into evidence and spore during the warm moist nights of summer, and it is therefore conceivable that under such conditions pathogenic spores might be liberated and inhaled by animals grazing, and in this way produce the mycosis of the lung suggested.

Careful miscroscopical examination up to the present has, however, failed to establish the probability of such a theory, or satisfy the subsequent difficulties of transmission and indefinite reproduction in an animal host.

The nomenclature of the disease (Oedema Mycosis) suggested recently by a South African investigator is therefore possibly inapt, and certainly premature, inasmuch as other careful workers have failed to demonstrate any degree of mycosis or mould-invasion in post-mortem examinations.

That no inflammatory lesions are discoverable in the lungs would seem to point to a morbid process in which the lung tissue played a passive or mechanical part rather than being the seat of a primary infection and development.

That organisms of small size would be capable of easy dissemination through the air is comprehensible, but it is not so easy to see why such dissemination should take place at a time when the air is laden with moisture from the depositing dew, and apparently at such time only, for moisture tends to prevent the diffusion of fine particulate matter through the air.

Points of resemblance exist between Horsesickness and Rinderpest, notably in the affection of the lachrymal mucous membrane and in gastric symptoms, which would tend to the classification of the former as a catarrhal disease capable probably of dissemination by the air. Practical experience, however, disproves the fact that any great degree of infectivity exists, as animals stabled closely on either side of a case of the disease rarely contract the disease.

Experiment alone will be capable of clearing up this obscure theory as to whether the cause of Horsesickness is due to respiratory infection.

(*To be continued.*)

Rain-making.

By G. H. Davies.

IN the last number of the *Journal* there is, under the above heading, an article dealing with rain-making experiments in Australia with the "Stiger Vortex." A full description of this system was given in an English magazine, and showed that the vortex is created by means of gunpowder exploded through a funnel directed at the clouds. It is used, however, in Italy and in Hungary, to prevent the formation of hail, and one would suppose, therefore, that its effect would be rather to dissipate than to condense. At any rate, your article admits that Lord Kelvin and Professor Boys do not seem to consider the attempt to produce rain by its means as likely to be successful, though the Australian writer quoted is hopeful that some way may be found to condense the heavy clouds that are naturally carried by the air currents to the warm atmosphere of the desert. The latter seems to be astonished to find that these clouds do not then condense, but, surely, he should be more astonished if they did. The surface of a bare country is a good conductor of heat, and warms the air above it so as to speedily rarify the heaviest clouds, while the cold air beyond rushes into the less densely filled space held by the heated air, and blows away the now attenuated vapours. It is, of course, possible, as he suggests, that science may find some means of condensing clouds over a superheated country, but it does not seem very likely. The obvious course is to cool the surface of the soil, and thus let the air above become cold enough to condense the clouds, but how mechanical science is to do this is not even faintly suggested. It is, however, wonderful what attraction is found in complicated methods, while well-tried, simple, and absolutely certain remedies lie plain around us. How does Nature not merely

cool the land surface, but render it equable in temperature, so as to act automatically on the air stratum above it, cooling it when too hot, warming it when too cold? Grasses, bushes, shrubs and trees—the last being best of all, and the slower-growing the better, because they levy a lower tax upon the water in the soil. Can any mechanical method be less costly than this natural one, which actually offers men wages for condescending to use it? The deserts of the earth must all be connected with deforestation, whether natural or artificial, and probably more of them result from the wastefulness of savage or barbaric man — whose foresight is rarely longer than his nose. It is probably impossible to afforest quickly any real desert. The work must proceed gradually from the edge of the more fortunate area, extending year by year into the waste, unless water can be procured from artesian wells or led down from the mountains. But deserts are not quite useless if they impress upon us the necessity for forest economy. Clouds will always condense sufficiently over country bearing its proper proportion of forest.

Canadian Farm Implements.

By Ergates.

I RECENTLY had the pleasure of a chat with Mr. J. Cumming, Trade Commissioner of the Canadian Government. He is making a tour through South Africa with the object of improving the trade relations of South Africa with his country. His vocation across the Atlantic is that of a miller, and more as a matter of pastime he runs a small farm. He is a most capable, all-round commissioner, and full of specific information on all sorts of things.

Of course, farming in Canada and farming in South Africa are totally different. For instance, in Ontario, the largest province, where the frost penetrates three feet into the ground during the winter, the stock of all kinds must be fed day and night for five out of the twelve months. A common class of farm, he said, was one of 200 acres. Such a farm would run 40 cows and, say, 15 yearlings, 6 horses, 20 to 30 sheep, and fatten off 100 pigs. The value of such a farm, well-equipped with good buildings, well, windmill, and all the improvements necessary for Canadian farming, would be about £10 per acre. Cows are milked ten months of the year.

I asked him to give me the retail prices to farmers of the following farm implements, etc.

Windmills.

"Windmills," he said, "are found on nearly every Canadian farm, and are much used as motors for all kinds of machinery which can be advantageously worked with intermittent power. I recently had one put up on my own farm, 12 feet wheel, tower 45 feet, well-pump included. It was erected by the maker, and the total cost was £25. Most of my little farm is devoted to fruit, and it may interest you to learn in face of the facts that our winters are extremely severe, and that we export enormous quantities of fruit, especially apples, that we all have to spray against blights. Every year my orchard is sprayed four or five times. A couple of men do it and if the spray pumps are good the work is got through quickly."

Farm Wagons.

"The South African wagon is undoubtedly a splendid vehicle for the work it has done in the past and the work it has yet to do opening-up fresh African country, but to me it seems altogether too heavy and cumbersome for farm work in opened-up centres. I am speaking only, of course, on general principles, for I don't pretend to have any knowledge of your local conditions. Our farm wagons for 1½ to 2 tons, and well made of the best material, are sold retail at £12. Farmers' truck wagons, about 2 feet high, with broad tyres, for going over soft ground, and intended for hauling stone, grain, and all kinds of produce about a farm, cost £8. If the gear were only

wanted, probably £5 or £6 would be the price. We in Canada do practically all our sowing by seeders. These machines sow in drills or broadcast, and, of course, can be set for roots. They fetch from £10 to £12. Mowers are largely manufactured in Canada both with horse and ox-gear. Some years ago I witnessed in our back parts a curious sight—a bull and horse yoked in. In Canada we make our bulls work. Mowers cost £8. The price of a first-class hooded buggie with drop seat in front, and superior in every respect, would be £25, and an open Gladstone, seated for four back to back, is sold at £20."

Of course there is nothing new in what Mr. Cumming said to those who have American and Canadian machinery catalogues, but to those who do not have them the prices should prove of interest.

District Reports.

HOWICK, 4th June.—During the month of May most unusual weather has been experienced, heavy gales of wind prevailing from the north and west, such winds in May not being known by the oldest resident. The heavy frosts which have fallen on six nights wrought a marked change on the general aspect of the country, the grass, which had kept very good, being now quite dry. Many farmers, whenever possible, are busy burning strips around their farms, as firebreaks, but lately the heavy winds have been so continuous as to almost prevent this being done. The maximum temperature during the past month was 84 deg. On two occasions 4 deg. of frost were registered. Only ·07 in of rain fell during the past month, with the consequence that the streams are running very low. The farmers have taken advantage of the dry weather and have completed their hay-making, and many are now commencing to reap their crops. With the exception of a few cases of scab among sheep, the stock of the District is in very good health, and considering the dryness of the veld, is in good condition. Horsesickness has entirely disappeared on the advent of frost. I would remind the farmers of this District that this Division has been brought under the provisions of the Grass Burning Act No. 31 of 1895, and it behoves them to study its provisions before setting light to grass, as the penalties are severe.

J. W. CROSS, Magistrate.

IXOPO, 3rd June.—During the last fortnight the weather has been very cold, and there have been severe frosts, and terribly high winds, with the usual amount of dust. The grass has turned off, and I fear the approaching winter will be an extremely bad one for poor stock, and whose owners have not grown winter foodstuffs. A few horses have died from apparently horsesickness; but horses, cattle and other stock look exceedingly well. The Natives have paid up their hut-tax, amounting to about £65, and appear to have plenty of money. On inspecting the Native Location, I was glad to see that goats are being largely bred by Natives; but there are no Angora goats, and I may add that in the adjoining territory of East Griqualand, there are numbers of very fine flocks of Angora goats; the progenitors of which are said to have been imported from Asia Minor about sixty years ago.

FRANK E. FOXON, Magistrate.

NEW HANOVER, 3rd June.—Strong north easterly winds and piercing cold have been the prevailing feature of the last fortnight. Horsesickness has died out. There have been a few cases of glanders at Noodsberg Road; the affected animals were quickly disposed of, and as there has been no fresh cases since, the disease has presumably been stamped out. There is another disease prevalent among horses which was not previously known in this Division: the mouth and lips of the animal swell, causing difficulty in eating, and in many cases the disease proves fatal. With the exception of the above-named cases, and an outbreak of lungsickness among Mr. Edward Boast's cattle, York, stock is healthy.

A. RITTER, Magistrate.

NQUTU, 31st May.—The past month has been a typical winter month, and frosts have been of frequent occurrence throughout. Some very heavy winds have been experienced during the month, causing considerable damage to the then standing crops by, in many cases, levelling them to the ground. Late mealie crops also suffered from the frost. During the whole month only two or three insignificant showers of rain fell. The grazing is all parched and withered up, and it is wonderful how cattle get through the winter here as they do. Lungsickness seems to have got a firm hold on the District, and several fresh outbreaks have been reported. Horsesickness has received a check in the frosts which were experienced. The general health of the District is good.

C. HIGNETT, Magistrate.

WEENEN, 1st June.—Autumn has given way to winter once more, and happily the late and heavy rains fattened the ripening crops now reaping; and left everywhere through this district a thick growth of grass, for winter grazing; long enough, generally, to shield from

Jack Frost, by its ample tops and seed heads, a bite of succulent stalk above the roots. And what crops those glorious rains have ensured. Mealies as long as an infant's arm, and miles of amabele, bending upon their stalks, stout though they are. Fields of great green melons, too, abound on every side, more than their prospered planters can, or care to, carry to their kraal's. Peace in every sense, save that in which such plenty brewed into beer spells broken peace, and often bones as well. But plenty certainly to Native mind; for, rein your horse in for a moment as you ride the corn-walled way, and humour yonder "kehla" on his harvest, as, sunning himself in comfort surrounded by his reaping relatives, he squats, as is the custom, looking on, and he will answer, "Yes there is a trifling crop this year, and many will the fines be that the Government will reap." He seeks the sequel e'er the corn is cut, and still is pleased, and in his happy heart he would not wish it otherwise. Horsesickness has run its usual riot, unchecked as yet by any light thrown upon its cause or cure by skill or study veterinary. A most uncommon, if not, indeed, unique, feature of the disease's course this year rests on the fact that, while it has been unusually severe upon the high veld, the thorn country—ordinarily regarded as fatal by horse owners—has practically clean escaped the deadly visitor. Lungsickness, never severe, and purely local, has, thanks to inoculation and strict quarantine, been stamped out. If only the further return of local owner's transport cattle, discharged from military service across the Tugela, is regulated rigidly, the District will doubtless enjoy another spell of its former immunity from this controllable scourge. Intending purchasers and patient petitioners eagerly await the long promised sale of the blocks carved out of the fertile valley comprising a few hundreds of the many thousands of acres of Weenen Town Lands. Every acre will be dearly bought, and when irrigated, from the intended higher level water furrow, will be brought under that continuous cultivation which has made the existing agricultural settlement, in the hands of experienced Colonists, so immense a success. Distance from market, and dependence upon the limited and, now-a-days, ruinously expensive primitive method of ox-wagon transport alone drags down the farmers' industry. Given a light line to link with Estcourt or Greytown, not only this increasingly productive centre, but miles also of equally fertile country pierced, would become of undreamt of value; and hundreds of tons of various fruits, which yearly rot where they fall, not to mention the bulk of wheat, forage, barley, potatoes, onions, and every vegetable, which through summer and winter are grown to such excellence in these, at present, backwoods of the Colony, would find their way to the now ungetatable consumer. It was gratifying to find that the gentlemen of the Lands Commission, who recently visited Weenen, are to a member entirely in favour of this rich agricultural country being tapped by the railway. These points promise to be brought into sharp prominence by local voters at the ensuing election. The future of this country hinges upon its touch with the towns, and the farmers, even of these remote regions, are at length awakening to the fact.

MAYNARD MATTHEWS, Magistrate.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 17th of July next:—

Springfield.—Reported as being too wild to be driven to the pound, black mare, three white feet and white face, no brands, aged. Chestnut colt foal, a little white on forehead. The mare and colt are reported by Mr. C. Neizel as running on his farm "Erasmus Dam." Blue mare, marked SL indistinct, very thin. Running on Mr. H. Brown's farm "Glenara." Note.—The dark brown mare, marked JVM, advertised in the "Gazette" of the 21st May, 1901, died in the pound on the 25th May.

Inglebrook.—Light grey pony, short tail, no brands, good condition. Chestnut mare, tail cut square, two white hind feet.

Aeton Homes.—Blue gelding, hog mane, short tail, very low in condition. Bay mare, star on forehead, branded on left leg, broad arrow, very low in condition. Bay colt foal, about 10 months old, foal of the above.

New Zealand exported no less than 4,828,397 frozen rabbits in their skins to England last year, as well as 3,960 skinned. She also shipped 48,137 hares to the same quarter.

A New York paper recently remarked upon the increase in the number of thoroughbreds added to the list during the last two years. Trainers, it is asserted, have come to the conclusion that geldings are more profitable than entires: they can run more frequently, their legs stand work better, and they are more easily trained. In this connection the same journal observes that American-bred sires are not usually popular in the country of their birth and most breeders prefer an imported horse.

Poultry Bugs.

WHILE at Greytown Mr. Cook, the poultry expert, discovered a fowl bug, with a brownish tint. Fowl bugs of a bluish tint he had found in the Cape, but Mr. Cook was told there was no such thing as a large bug in this Colony. He then expressed his conviction that there was, as he found so many birds drooping and dying — generally put down to fowl-sickness. In his researches at Greytown Mr. Cook came across a large number of birds looking very bad, and he discovered that they swarmed with bugs. The fowls were wasting away. The nature of the bug is not to stay on the bird, but to come out at night, suck the blood, and retire in the daytime to the cracks and crevices in the perch.

Correspondence.

To the Editor Agricultural Journal.

NATAL GRASSES.

DEAR SIR,—Will you kindly have the two specimens of grass (I fear, though, they are rather old), named for me, and say if they are perennial.

They come up every time land is ploughed. Stock of all kinds eat them readily; fowls like the seeds which fall from A.

Both grasses grow luxuriantly, and one could get good crops of hay from either or both.

Thanking you in anticipation of your reply. Yours truly,—

JAMES THORROLD.

Sunday's River.

Mr. J. Medley-Wood, A.L.S., of the Botanic Gardens, Durban, kindly replies as follows to the foregoing questions :—

GRASSES SENT FOR IDENTIFICATION BY MR. JAS. THORROLD.

A. Panicum Isachne (Roth).—Of this grass I have no information, but most of the genus Panicum are good fodder grasses. The value of this particular species would be best ascertained by farmers in whose vicinity it is found. It is annual. (Natal Plants, Plate 149.)

B. Eleusine indica (Gaerten). — A grass which is cosmopolitan in the tropics. It is said to be a good fodder grass, and cattle are, I believe, fond of it, but it is annual, not perennial.

MANNA HAY.

SIR,—Very few farmers seem to realise what a valuable fodder we have in the variety of "manna" or millet which is grown in the Transvaal. There are, of course, many different kinds of millet, but I think the sort which sells so readily on the Johannesburg market is infinitely the best. I have grown it for two years, and am very pleased with it, as it seems to be able to stand great hardship in the way of drought and rough weather.

My crop this year will run out three tons to the acre, which I consider a good yield, seeing that it only requires 10 lbs. of seed to sow an acre. I have never seen a sign of rust in it. My neighbour last year planted some in the early spring. The seed lay in the ground for three weeks or so until the rains came. It started away at once, and he reaped it in the summer, a good crop without a speck of rust. There will be a large demand for manna when communication with Johannesburg is again open.—Yours, &c.

ARTHUR B. KOE.

Estcourt, 24th May, 1901.

"How do you buy your apples? By the barrel?" "That's the way I try to buy them, but when I get them home I generally find I have bought them by the top layer."—*Chicago Tribune.*

Many people have the idea that eggs are only used on the breakfast-table and for ordinary purposes. Eggs are used in hundreds of thousands in many manufactures. Late years they have been used in the composition of toilet soaps.

Horse-breeding.

IMPROVEMENT IN SHIRES.

THE change that has come over the horses that we see working on the land, or feeding in the pastures of an evening as we drive through the country, is a very marked one in Lincolnshire and the other more active agricultural parts of the country. The Shire Horse Society has been mainly instrumental in bringing this state of things about in the part of the country best known to me. When private gentlemen of fortune take up breeding as a hobby and intellectual study, in time a grand result may be expected. This has certainly been the case with the cart-horse of the Eastern Counties, which has gradually evolved into an animal of the finest parts. The horse of to-day is different in all respects, but in name and descent, from the specimens exhibited at our first shows in London. He is as far superior to his forbears as the improved Lincoln or Leicester sheep is to its progenitors. Grace, action, and quality—beauty, to use one word in its most horsey sense — are now combined with a sound constitution, and legs and pasterns of a type rarely seen in the old days. Along with these traits of new character the modern horse stands on legs and feet fully calculated to carry his weighty frame and abundant clothing of muscle through a long and active working life. If there is a point in which we think there is a little going back from the best type of working horse, and a little alteration is necessary, it is in the matter of weight in normal working condition. Your thickset man of medium height can put the little or big man easily into his proper place in working, and it is the same with the horse.

Show Animals.

As a rule most of our mares and show sires have been bred with an eye for their show-ring quality rather than for practical work-a-day life, and during this process they have lost some of their ease, weight, and power, which is so essential to a horse when starting a heavy load. Surely it is for hard work and the transport of heavy goods that the Shire has been evolved? It has not been produced merely for pleasure or show purposes, and it will be the greatest pity if we let it degenerate from the highest working standard.

The dog and fowl show mania have proved how the show-ring type can oust more practical forms from public favour. Points in animals and birds are only valuable as long as they serve a useful purpose in preserving valuable qualities. When they become purely artificial, like white legs or feathers of a certain colour or shape, they become a hindrance rather than an advantage. The London Shire show of this year struck me as rather tending towards the artificial extreme; and this drift is a most dangerous pitfall for all breeding societies which should be most carefully avoided. We would rather see the champion cups for the best horse and mare carried off by inferior "looking" animals, than that the most serviceable "working animal" should be at a discount.—"The Farmer."

A correspondent writes:—"You referred in a recent Scrap to the value attached to the various colours of horses. Looking through the volume on 'Leechdoms,' in the 'Chronicles and Memorials of Great Britain,' the other day, I found that the Saxons interpreted the colours of horses seen in dreams to signify various things. 'To sit on a white horse betokens good luck. To sit on a black horse betokens anxiety. To sit on a dun horse betokens advancement. To sit on a brown horse betokens misconduct.' If you dreamt that you saw a wild horse running, or you got harm from such, meant that some mischief would befall you. Every animal seems to have meant something to the old Saxon dreaming. To see a pig betokened indisposition. A hen laying eggs indicated gain with carefulness; a hen with chickens, increase of trade. Oxen grazing meant success in trade; oxen sleeping, bad luck in trade. If you dreamt that you rode a foal it indicated cheating in trade. but whether you would cheat somebody or somebody would cheat you the 'prophet' who compiled this useful manual omits to say.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write :—The market all round remains quiet. The dry season has now set in, and farmers are, in many instances, sending in their grain. Although some of them are loud in their assertion that the crop in many distri ts is far from heavy, others are equally certain that there will be a heavy crop generally. Of course, locality has much to do with condition and quality.

Mealies.—The market is very uncertai , and prices have fluctuated between 4s. 6d. and 7s. per 100lb. ; however, farmers are ready and willing to sell at 12s. per muid.

Forage.—Small quantities coming forward. Some samples have been down to 5s. 9d. and 6s. per 100lbs. ; others have realised 10s. 6d. and 13s. 9d. per 100lbs.

Hay.—From 1s. 2d. to 2s. 7d. per 100lbs. ; bedding from 4s. to 10s. per load.

Potatoes.—Early Rose, from 9s. to 17s. 6d. per 100lbs. ; Magnum Bonum, from 8s. 6d. to 16s. 9d. per 100lbs. ; Red Roughs from 7s. to 15s. 6d. per 100lbs. ; Flour Balls, 4s. 6d. to 11s. per 100lb. ; Sweet potatoes, from 3s. to 7s. 6d. per sack.

Mabele.—There is a considerable area under cultivation this season, and large quantities are now coming forward, with the result that there is a fall in price ; 6s. to 7s. 6d. per 100lbs. is now accepted for good samples.

Buckwheat.—From 9s. 6d. to 11s. per 100lbs.

Tobacco.—About 1s. per lb.

Pumpkins.—From 1s. 6d. to 7s. 3d. per dozen.

Onions.—From 42s. 8d. to 45s 10d. per 100lbs.

Eggs.—Prices are still high, ranging from 2s. 1d. to 3s. 6d. per dozen.

Butter.—Several samples have been as low as 10d. and 1s. 1d. per lb. ; better quality from 1s. 5d. to 2s. 4d. per lb.

Poultry.—Fowls, from 1s. 3d. to 6s. 9d. each ; ducks, from 5s. to 8s. 3d. per pair : turkeys (cocks). 13s. 6d. to 16s. 9d. each , (hens), 6s. 6d. to 7s. 6d. each.

Sundries.—Mutton, from 3d. to 9d per lb ; pork, from 4d. to 9d. per lb. ; ham, 6d. per lb. ; bacon, 3d. to 6d. per lb.

Vegetables.—Bringals, beans, beetroot, cabbages, carrots, chillies, cauliflowers, celery, lettuce, onions, tomatoes, and turnips comprise the varieties sold daily.

Fruit.—Apples, bananas, guavas, lemons, mandarins, naartjes, oranges and pineapples are disposed of daily by the marketmaster.

Wood.—From 8½d. to 1s. 1½d. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes :—

General.—Business is fairly brisk all round though the difficulty of railing anything up-country remains as bad as ever.

Mealies.—Things are somewhat quiet again in this staple. A fortnight ago large enquiries were being made, but the difficulty in securing parcels at reasonable rates appears to have frightened away buyers. At all events, business is confined to hand-to-mouth basis and quotations are easy again. Eleven shillings per bag is about the average figure paid for the coast crop. Growers, however, are selling to speculators on the spot at a price well under this.

Potatoes.—Rates are h gh still, and are likely to keep so until the arrival of large supplies of Australian potatoes. The Colonial article is bound to be affected by importations, though perhaps not to any great extent, as up-count y growers now have the Johannesburg market to themselves, as well as the differential rates in their favour.

Mabele.—This is being freely offered, and prices are easy. With a falling market quotations are only nominal.

Hay is a good supply, but the quality hitherto is below that of late years.

Bran.—Cape ports are now closed on account of plague, and importers have to rely solely on South American and Australian bran. A good rise may be looked on as certain ere long, as quotations are even now at cost and somewhat below. The market varies from 6s. 6d. to 7s 6d. per 100lbs., according to quality.

Onions.—Famine rates for this useful vegetable have prevailed for some weeks, and it will be some time before things are easier. In any case the duty of 1d. per lb. will always keep prices high. The duty amounts to more than 100 per cent. on the prime cost of onions at port of shipment.

In Bremen (Germany) a cold store is being erected for horseflesh.

In 1773 an underground stable was discovered in the parish of Orcop, in Hertfordshire This retreat was used as a hiding-place for stolen horses by three professional horse-stealers, who were caught in the stable and lodged in Hereford Gaol.

There are 141 steamers engaged in the frozen produce trade with Australia, New Zealand, and the River Plate. These steamers have a total capacity of 7,001,400 tons. There are 17 refrigerating stores in London, with a capacity for 1,590,000 carcases.

Dairying in Australia.

THE HON. F. R. MOOR'S IMPRESSIONS.

(*Continued.*)

THE following is a further instalment of the pamphlet :—

PASTEURIZING.

In order to understand the pasteurizing system of treating milk or cream for butter-making purposes, it is necessary to have a knowledge of the composition of milk and its relation to bacteria. Milk is a complex food, and is composed principally of water, fat, caseine, sugar and ash, in the following average proportions :—

Water	86.80
Fat	3.70
Caseine and albumen	3.75
Sugar	5.00
Ash	0.75

Two great objects are sought in the pasteurizing of milk or cream. The first is to drive off the obnoxious gases that are present in milk produced from certain fodders, such as rape, lucerne, &c. Such milk has a strong, undesirable odour, usually termed as "cowy." It has been found that by proper aeration this fault is easily got rid of, but for some reason or other the farmer has not taken to aeration.

In order to be effective, the aeration of milk must be carried out at a high rate of temperature after coming from the cow and before the undesirable element becomes fixed in the milk. Since the milk producer has not undertaken this easy precaution in regard to the welfare of his milk supply for butter-making, it is therefore compulsory to effect the desired object at a later period — that is, when it reaches the creamery or factory. As the milk generally arrives comparatively cold at the creameries, it is not possile to get the objectionable volatile elements liberated without raising the temperature. It is found that the pasteurizing of the milk and the later exposure of it on the cooler to the atmosphere effected the object sought for by aeration.

As a matter of fact it appears that greater good has been achieved from this point of view than from a bacterial standpoint. All the experiments so far conducted prove that the greatest success in improvement of quality is noticeable only in districts that produce milk off of rich artificial grass pastures. It is still doubtful whether pasteurization will effect any improvement in butter made under good conditions from milk produced on clean hard pastures.

The second object looked for is to kill all the active micro-organisms that develop in the milk after it leaves the cow. Hitherto this has been the only consideration dwelt upon by scientists. It is well known that the milk in the udder of a healthy cow contains no bacteria. Many experiments have proved conclusively that such is a fact, and that all the changes that subsequently take place in the milk are due to the growth of bacteria. In ordinary dairying it is impossible to take milk from the cow without bringing a certain amount of bacteria with it into the bucket. Their presence is universal. They are in the air, in dust, in the soil, and in the water. Their chief function is to break up substances or bodies for the use of living animals or plants. Under favourable conditions bacteria multiply at an enormous rate. Milk is an excellent medium for their propagation.

Usually a certain class of bacteria acts upon the milk-sugar and converts it into lactic acid ; this acid gives the sour taste and thickens the milk. This is looked upon by the milk producer as prejudicial, and yet the butter-maker, in order to bring about the changes necessary in the cream before making good butter, has to make overtures to and encourage the same class of bacteria by supplying the requisite conditions for their development. The results in the past were very uncertain owing to the want of know-

ledge that existed in regard to this then unknown power. As well as the friendly bacteria getting into the milk and cream, very often unfriendly characters find their way in also. The number of unfriendly germs are sometimes present to such an extent that an evil result must ensue. The surroundings are always responsible for this state of affairs. If the milking yards are dirty and dusty, or the cows and milk vessels not properly cleaned, the result cannot be otherwise than bad. It is to kill the undesirable organisms that pasteurization is intended.

PASTEURIZING MILK OR CREAM FOR BUTTER-MAKING.

Pasteurizing mi'k or cream to obtain a superior butter is the latest development of dairying. Still we cannot by any means call it a new discovery, for there is nothing new in heating milk to 155 deg. to get rid of bad odours caused mostly by artificial feeding of various sorts and qualities. A similar system was practised by the dairy people of Devonshire and Cornwall 500 or 600 years ago, for who has not heard of Devonshire scalded cream? In two important points, however, their system and ours differ, viz., in those old times, after the milk was heated to a high temperature, it was allowed to cool in the pans without artificial means, while in ours it is cooled by refrigerating machinery at once to 60 deg. or lower, by this means solidifying the fatty globules in the milk, and thus when the cream is churned ensuring a good grained as well as a sound keeping butter.

Another important change from the old system is that whereas the milk was allowed to stand till the cream gathered and ripened, which did not take place for three or four days, sometimes longer, now by putting in a quantity of "ferment" or "ripener" in the cream it is ready for churning in 24 hours, or before any deleterious bacteria gets back again in the cream.

The following is a description of the process practised at present in our factories. Taking for granted you have got the milk in your dairy or factory in a sweet and sound condition, and that you have a pasteurizing plant fitted up to date, you then run the milk through the separator, making the cream a little thinner than usual. From the separator the cream runs into the heater; watch that the temperature of the cream does not rise higher than 155 deg. From the heater the cream passes on to the cooler, which, with the aid of the refrigerator or ice, will bring it back to 60 deg. or lower if required. The ferment, or starter, is now added. The quantity required of this starter is from 5 to 10 per cent., according to the amount of acidity in it and the time at which it is intended to churn.

How to obtain the Ferment or Ripener.

The European system is, take 1 gallon of sweet skim milk and heat it to 155 deg. Fahr., and then cool the milk quickly to 90 deg.; then add to it a bottle of the cultivated ferment, which is now imported from America, Denmark and Sweden. This done, place the milk in a water bath at 90 deg., and leave it for eighteen hours. This milk must be covered with a thin butter-cloth only. After this the milk will be thick. It then has to be cooled down to 60 deg. in cool water, and left alone without stirring. Only the top of it has to be skimmed off before use. The ferment is then ready for ripening the cream, which is now kept at a temperature of about 60 deg. If everything be right the cream should be churned in 24 hours, and the butter afterwards treated in the usual way.

The 1 gallon mentioned previously will be sufficient for ripening 20 gallons of cream. Of this ferment you must take 1 quart for making the "acidifier" for the following day, which is done in the following manner:—Take 1 gallon of fresh skim milk and heat it up to 155 deg. Fahr.; then cool to 90 deg.; add the quart of sour milk, and leave it for six or seven hours. Then the 1 gallon and 1 quart of milk is ready for ripening the cream next day. If the result of this ferment turns out good butter you may continue this ripener for some time before fresh lactic ferment is required.

Victorian System.

Perhaps it may be advisable to give experiences here of obtaining this ripener or ferment, because it is very often found that a successful dairy system in a cool climate is often the opposite in a hot one. For instance, experinee has taught us that very little of the imported "ferment" is sound on its arrival here, as it will not stand age and long carriage. It has therefore been found neeessary to make our own ripener just in a similar way to what has been already deseribed, but with this slight differenee, that whereas some of the European dairymen start with a scientifieally eultivated "ferment," we start with a sound new milk instead of skim milk, which in our climate often becomes deteriorated before arriving at that stage. However, much attention has of late been given to the preparation and use of cultivated ferments, and doubtless in the near future we will be able to send out for use pure eultures that can be relied upon to give satisfaetion.

When a manager wants to ehange his starter his easiest and best plan is to obtain a little buttermilk from an adjoining faetory making a first-class butter. Then the ehurning and the usual process of manufaeturing butter for market may be adopted. Before finishing this subjeet, it may be added that Messrs. A. N. Pearson and the dairy experts have for the last four years been experimenting in several of our factories, advising and demonstrating to the managers this system of butter-making, proving the merits of the method when the butter goes off flavour, and have sueeeeded in curing the faulty eream coming from a large number of creameries ; but from some reason yet to be found out, the faetory and creamery managers do not always keep the quality of the cream, after being pasteurized, up to the required standard.

We have also frequently exported a portion of the butter made at four of our best factories, but, with the exception of one, it eannot be said that the prices obtained have been as yet mueh above the average priee obtained for butter made in the usual way. Probably our hot seasons and dried-up pastures, also long distance of carriage of milk from farm to factory, may militate against the complete success of this system being adopted in Victoria. Still it is recommended, were consumers' eomplaints about the quality of the butter are numerous—and there are few faetories where such are not rare—to make butter by this plan, in order to overeome the diffieulty. There is no doubt that, as the system of pasteurizing beeomes better understood by managers, superior results will be achieved ; and now that the method has been given an impetus it is expeeted most of the faetories in the Colony will be pasteurizing their outputs within another season or so.

CHEESE.

Canadian-Cheddar Cheese.

The unsatisfaetory prices that have been obtained in England for eheese during the past two seasons have resulted in our dairy farmers losing sight, to a very large extent, of the importance of always being ready, in the event of a sudden fall in autumn in the value of butter, to eonvert the greater part of the milk into cheese.

So long as priees for butter in London continue remunerative, cheese-making for export will be a neglected industry in Victoria. But prices are not always going to remain as profitable for butter as they have been during the past two years. We have had three dry seasons in succession in Victoria, and owing to the searcity of butter, the usual fall in value at the end of each of the past shipping seasons did not take plaee. But we are not always going to have dry seasons. Already there are indications that the season 1898-9 is going to be the best experienced sinee 1894-5, and should the present favourable prospects continue, there will be a large supply of milk next autumn.

Do the proprietors of butter faetories realise what a heavy supply of autumn milk means ? We are inelined to think that they seldom give mueh thought to the matter. Having passed through

three dry seasons, it is quite probable that there may now be a run of good seasons. If so, the annual production of milk will be enormous. Additional land is being devoted to dairying every year, and new factories and creameries are being erected to deal with the increased supply of milk that will certainly be available.

A warning is necessary at the present juncture, and it is considered essential to point out to milk-growers not only the rock that looms in the distance, but also the means whereby that rock may be avoided.

The probable export season for butter terminates about the end of April in each year. Butter exported in May would arrive in England right in the middle of their flush season for milk, and the prices obtainable at that time of the year for best Victorian factory butter would not be sufficiently high to enable our factories to pay more than, say, 2d. per gallon for milk, perhaps not so much

Given, then, that we have a moist spring, and a favourable summer, the supply of milk during February, March, April, and May will produce more butter several times over than will be required for Australian consumption. This will mean that prices here will probably fall below 6d. per lb. for prime quality. All below prime quality will have to be sold at an unprofitable figure. Prices for milk will be so low that dairy farmers might become disgusted with their occupation, and suddenly abandon dairying, and sway round to some other occupation that just at the time might be offering better prospects. Such a state of affairs would be calamitous both to the individual and to this country generally; but how is it to be avoided? Simply by combining cheese-making with butter-making at all our leading factories. This is the only way out of the difficulty, and if neglected the result will be serious for the dairying industry.

In England there is, as a rule, a fairly good market for good Cheddar cheese during the months of February, March, April, and May. The price, of course, will not leave as good a margin of profit as we have been getting for butter during the past three seasons, but the price which good cheese will realise, if shipped at the right time, will pay dairy farmers very much better than glutting the Melbourne and English markets with butter during the summer and autumn. It is, therefore, advisable for factories to be in a position to convert milk either into butter or cheese as the requirements of the world's markets may demand. By thus being able to manufacture cheese when butter is low, and vice versa, gluts will, as far as possible, be minimized, and sudden fluctuations in the value of milk avoided.

Having so strongly recommended cheese-making during the summer months as the best possible means of avoiding a glutted butter market in the autumn, milk-growers will naturally expect some plain practical instruction regarding the latest and most approved methods of making cheese by this Canadian-Cheddar system.

Pure Clean Milk necessary.

Before a factory makes arrangements to commence cheese-making there should be some guarantee that none but the very purest and cleanest milk shall be supplied. Purity and cleanliness in milk is far more necessary for cheese-making than for butter-making, although for both it should always be clean and pure. Begin by prevailing upon the milk suppliers to have clean cowsheds, to clean the cows' udders before milking, and to always keep their hands clean. A beginning must be made at the fountain head, because unless the strictest cleanliness be observed at every stage, from the time the milk is drawn from the cow until it is delivered to the cheese-maker, it is impossible for a good quality of cheese to be manufactured. There is altogether too much indifference amongst our milk-producers regarding this question of cleanliness. If anything like a correct estimate could be obtained of the depreciation in the value of our butter during one year owing to impurities in the milk and the want of cleanliness in handling it, the figures would have a startling effect on the community. Seeing that

cheese requires purer milk and cleaner milk than butter, how very important, therefore, is it that all milk-suppliers, by supplying only the purest and cleanest of milk, should co-operate with the cheese-maker in producing a really prime article for the English market.

Receiving the Milk.

Every can of milk that is intended for cheese should, before being accepted, be very closely scrutinized. Firmness on the part of the chees-maker at this stage is of the utmost importance. Should there be the slightest shadow of suspicion as to either its sweetness, purity or cleanliness, reject it at once. One can of unsuitable milk will destroy the whole of the milk received that morning. Why, then, should the milk of, say, nineteen careful milk suppliers be ruined just to accommodate one neglectful supplier who is too obstinate to acquire habits of cleanliness ? Assuming the milk to be up to the required standard, it is received from the suppliers and strained into the large receiving vat, and gradually heated up to 86 deg. Fahr. The vat and the method of heating are so sufficiently well known that a description is unnecessary.

Adding the Rennet.

When to add the rennet is a stage in cheese-making that requires very careful attention. When the milk in the receiving vat has been brought to a temperature of 86 deg. Fahr., put about 5 ounces of it into a tea-cup. For this purpose have a graduated measuring-glass, which only costs two shillings.

To the 5 ounces of milk add one teaspoonful of any good brand of artificial rennet. Stir the milk and the rennet together for five seconds, and then watch for it to thicken. Should it thicken in from fourteen to seventeen seconds the milk in the vat will be ripe enough to "set," that is, to receive the rennet.

Sometimes, however, the milk does not thicken in from fourteen to seventeen seconds, and this happens, in cold weather. The lowness of the surrounding temperature, even when the milk is at 86 deg. Fahr. has been known to cause the milk to take 25 and in some cases 30 and 35 seconds to thicken. When this happens the temperature of the milk in the vat must be continued for a little while longer at 86 deg., or even increased a little, but on no account must it go over 90 degrees. By waiting a few minutes, keeping the milk in the vat a little over 86 deg., it will ripen, despite the cold weather, when the fourteen to seventeen seconds test in the tea-cup will then come out all right.

The rennet must not be added until proof of the proper ripeness of the milk has been decided by the tea-cup test.

There is a very simple plan for telling the very moment when the milk in the cup has thickened, and beginners ought to make use of it. When the 5 ounces of milk are put in the cup, before adding the rennet put a small chip, say half an inch of a wooden match, or small piece of cork, into the milk, and then stir rapidly when adding the rennet. The little chip will whirl round with the milk, but the moment the milk thickens the chip will suddenly stop. By keeping a close eye on your watch the exact number of seconds from the adding of the rennet to the stopping of the chip is easily counted.

Quantity of Rennet.

If good rennet is purchased the proper quantity to use is at the rate of 2 ounces for every 50 gallons of milk. This is the correct proportion. After thoroughly mixing the annatto with the milk then add the rennet. None but the best brands of rennet should be purchased. Stir the milk well for five minutes after adding the rennet, and then let it settle.

Testing Rennet.

As rennet varies in quality its strength should be tested regularly. In factories every new supply ought to be tested. On farms where only a small quantity is used every bottle as it is opened should be tested before using. If the proportions stated in the standard referred to (a teaspoonful of rennet to 5 ounces of milk) does not thicken the milk in the cup in seventeen seconds in favourable weather, providing, of course, the milk is at the right temperature, then the rennet is weak in quality, and the proportion

per 50 gallons of milk in the vat, as already explained, will have to be increased. Experience and observation soon enable even a beginner to determine the exact quantity of rennet to use, even should the quantity vary a little in strength. The use of too much rennet must be guarded against. Too much rennet is one of the causes of "streaky" and of "bitter" cheese.

Annatto.

One ounce of annatto to every 50 gallons of milk will be sufficient. For cheese intended for export not more than half-an-ounce of annatto per 50 gallons of milk should be used, for the reason that the English consumer prefers a straw or lightly-coloured cheese. Add the annatto as soon as the test shows you the milk is ripe enough, and then stir well for five minutes so as to mix it evenly and thoroughly with the milk.

Cutting the Curd.

In about twelve minutes after the rennet has been added, the milk in the vat will have thickened or curded. A close watch must be kept so as to note the actual time the milk takes to curd. Having ascertained the actual number of minutes the milk took to curd, the time for cutting the curd will be two and a half times the number of minutes that elapsed from when the rennet was put in until the milk curded. Suppose, for instance, the milk takes twelve minutes to curd, in 30 minutes afterwards (i.e., twice and a half times twelve) the curd is ready to cut. When everything goes on all right the "cutting" should commence from 40 to 42 minutes from the time when the rennet was added.

Here is an illustration showing how the whole operation actually works out.

Assume that the milk is ripe at a quarter to nine.

Add annatto at a quarter to nine, and stir the milk well until nine o'clock.

At nine o'clock add the rennet.

Stir the milk thoroughly until five minutes past nine.

At twelve minutes past nine the milk will be curds.

Thirty minutes afterwards (two and a half times twelve), i.e., forty-two minutes past nine, the curd will be ready to cut.

By following this rule no mistake will be made as to the proper time for cutting the curd. Dipping the finger into the curd, a test adopted by many people, should be avoided.

How to Cut the Curd.

Extreme caution is required in cutting the curd, and care must be taken to avoid breaking or bruising it in any way, and the cutting must be cleanly done, leaving no bruised surface. The knives must cut well. There should be no dragging, nor should there be any ragged surface on the curd when cut. First use the horizontal steel knife lengthwise, going from end to end of the vat, then use the vertical knife, going also from end to end. After this has been done then run the vertical knife through the curd across the vat, i.e., from side to side The curd should now be all in the size of about half-inch cubes.

Developing Acidity.

Having cut the curd, the next operation is for the development of acidity. Boiling water will now have to be used in order to raise the temperature of the whey up to 100 deg. Fahr. Before surrounding the vat with hot water it is always advisable to pass the hand gently round the sides and bottom of the vat so as to remove any curds that might be sticking there. It will take about 40 minutes to raise the temperature of the whey up to 100 deg. The curd meanwhile must be kept slowly stirred with a rake with the teeth set wide apart so as not to cause any bruising. As the curd gets firmer stir faster, until 100 deg. has been gradually reached in the 40 minutes. When 100 deg. has been reached draw the hot water from the vat at once, and allow the curd to settle down for about an hour and a half, the vat meanwhile being covered in order to maintain an even temperature. At the expiration of the hour and a half sufficient acidity ought to be developed in the curd to permit of the whey being drawn off.

Testing the Curd for Acidity.

The only sure test for showing when the acidity is coming is the hot-iron one. Get a piece of half-inch iron and make it nearly, but not quite, red hot. Take a handful of the curd, squeeze the whey out by compressing it gently, and then apply the hot iron to it. If when lifting the iron up from the curd it draws out fine hairy threads about one-eighth of an inch long it is time to draw the whey off and remove the curd to the cooler. If, however, the fine threads are not seen to be drawn up by the iron the curd must remain a little longer in the whey in order to reach the proper stage of acidity.

In the Cooler.

When the whey has been run off remove the curd to the cooler. Let it remain without being disturbed for about ten minutes in order to give it time to "mat." After "matting" it is cut into squares for convenient handling, and also to permit of further drainage of any whey. Turn the curd every quarter of an hour for about an hour to an hour and a half. When the curd is placed in the cooler it is most important that the cooler, except when handling the curd, be covered with a sheet or piece of strong "duck," in order to maintain an even temperature and further develop the acidity.

After being from an hour to an hour and a half in the cooler, again apply the hot iron test for acidity, when if the fine threads this time draw out fully three-quarters of an inch long, it will be time to put the curd through the curd cutter. If the fine threads do not come as described, turn the curd again, keep the cooler covered, and wait a little longer. Developing the proper acidity and allowing the gases to escape are the secrets of success. If everything goes on all right the curd should not require to be in the cooler for more than from an hour and a quarter to an hour and a half, but at the very outside not more than an hour and 40 minutes.

The Curd Cutter.

The old curd mills that were used fifteen and twenty years ago are out of date. They used to bruise, tear, and grind the curd down too fine, thereby allowing the richness to escape, which reduces the quality of the cheese. The new style of curd cutter cuts the curd as clean as you would cut chaff, instead of bruising it down as the old-fashioned curd mills did. The curd is only put through the cutter once, and it comes out in clean cut strips, each about 3 inches long by about half-an-inch in diameter.

Salting.

After putting the curd through the cutting machine it must be kept stirred and turned over now and again to prevent "matting," which operation also circulates the air through it, and cools it down to about 72 deg., at which temperature it is ready for salting. Add 1 lb. of salt for every 50 gallons milk that were in the vat. After mixing the salt thoroughly with the curd, give the curd another ten to fifteen minutes to allow the salt to properly dissolve before putting the curd into the "hoops" and pressing.

Cheese Presses.

Where large quantities of cheese are made, such as in factories and on large dairy farms, the "gang" press should be used, but for small dairymen making only one or two cheeses a day, the ordinary screw press will do, as it saves the outlay for a "gang."

The "hoops" being made of galvanised iron and in four pieces, are one of the greatest improvements in modern cheese-making, as they entirely dispense with all the bother that used to be attached to the proper adjusting of lids and trimming the edges of the cheese.

Be careful not to press the curd hard the first half-hour, or the richness of the cheese will be lost. A sudden heavy pressure at first will also form a skin on the cheese which will prevent a free escape of whey, and result in a "streaky" or "mottled" cheese. Increase the pressure gradually after the lapse of half-an-hour. From fifteen to twenty hours, according to the size of the cheese, will be long enough for it to remain in the press.

Then remove from the "hoops" and transfer direct to the shelves in the curing room.

In the Curing Room.

After cheese has been six weeks in the curing room it will be ready for export to London. During the six weeks while the cheese is in the curing room it will require to be "turned" once a day. Cheese intended for the Australian market need only be "turned" every second day until it is three months old, when it is fit for consumption. Uniformity of temperature is a very essential point in the curing room. The temperature should, as far as possible, be maintained at about 66 deg.

Cheese Bandages.

The imported seamless bandages are the best to use. Exporters of cheese to London should use no other. If, however, the ordinary cheese-cloth be used, sew it to suit the size of the "hoops" used, cut into required lengths, and then turn it inside out so that the seam will not show on the bandage on the outside. Always adjust the bandage on the hoop before filling with curd.

The Cheese Press.

All cheese factories and on farms where a large amount of cheese is made, the American gang press will be used. Small dairy farmers, who perhaps may not be making more than one or two cheeses daily, will find the old screw press answer the prupose just as well. The economy of the gang press is that it will press a number of cheeses at a time, hence its advantage to factories and large cheese-makers.

The "Hoops."

What old cheese-makers of twenty years ago called the "cheese-vat" we now call the "hoops." The cheese is pressed on the "hoops," and the "hoops" are greatly superior to the old style of vat. Where farmers, however, have got the old wooden vats these will do right enough for making cheese for home consumption.

Shipping Season for Cheese.

The manufacture of cheese for export to England will require to begin every year about the middle of November, or early in December, according to the conditions of the season, prices for butter, &c. January and February are the months when the output of cheese will be at its highest. As Cheddar cheese can be shipped when it is a month old the shipping season will thus commence from about the middle of December to first week in January, and continue until about the middle of April. This will land our first manufacture of the season in London about from the middle to the end of January, and the last shipment for the season should reach London on about from the first to the middle of May.

(To be continued).

The homely potato is to have a rival in the shape of another member of the same family. Solanum Commersoni in its general characteristics resembles the common potato. Its elongated and wrinkled tubers average about 2½ oz. in weight. The taste is first bitter, and afterwards sweet. It is probable that cultivation will greatly improve its qualities, and that with this plant will happen what took place in the case of the potato. Mons. P. Hariot says in *Le Jardin* that this plant has been cried up as destined to replace the potato in a time more or less distant. Introduced into Uruguay a few years back by the consul of the South American Republic at Marseilles, the Solanum flourishes on the banks of rivers; it is then semi-aquatic, and can maintain itself well in humid and irrigated places.

It is commonly believed, after Bracy-Clarke, that horseshoes with nails came in with the mounted barbarians who invaded the Roman Empire, and that those of the Huns, Goths, Vandals, etc., served as models for the mediæval cavalry. M. Louis Adrien Levat, in the *Revue Scientifique*, says this opinion is quite as mistaken as that which, on the strength of Homer's courses with "feet and iron" makes the origin go back to the heroic ages. Hippo sandals are mentioned by Catullus, but not the nailed shoe, which, however, was invented about the second or third century, as the funerary monument of Vaison in the Calvet Museum, Avignon, and excavations at Narbonaise have shown. It was the construction of the great Roman causeways which promoted its introduction. After the dismemberment of the Empire, it became armorial and architectonic. William the Conqueror fostered the new art, and had an hereditary superintendent of horseshoes, the Ferrers, of Rutlandshire, who probably gave rise to the custom of nailing horseshoes on doors.

Pigs Grazing.

THE above is a photograph taken by "Ergates" of some of a troop of pigs grazing on Mr. John Marwiek's farm. The following is reproduced from the interview which "Ergates" on the oecasion of taking the photograph had with Mr. Marwick :—

While riding round the farm I noticed a coolie herding a troop of pigs. Mr. Marwick said that throughout the neighbourhood it was the common practice to send out the pigs to graze on the veld in charge of a herd, who brought them baek at night to kraal and feed. He said the coolie I had noticed "was put on the job the first day he arrived, and does his duty splendidly ; he moves among his charges on the most friendly terms, and if he sees one of them wandering off a little too far from the troop, all that he has to do is to give it a call and the straggler instantly closes up at a run."

"Do you make mueh baeon ?"

"No, selling pigs alive pays best now. I used to make a good deal, but until the live price drops to 2½d. per lb. it will not be worth while to think of bacon curing. I used to run 300 pigs or more, but now I have only about 100. Pig-keeping is altogether a question of food — mealies, separated milk, etc. They find lots on the veld, but other food is necessary for them when they eome home at night, and for young ones, and for finishing off. The Richmond Canning Company, which promised so well, collapsed through the locusts. In 1896 I had every crop then growing swept off ; where in the morning there was promise of splendid crops, in the afternoon there was nothing but a dry, barren waste. Pigs, by-the-bye, are splendid locust exterminators : we used to put the troop among the hoppers early in the morning before the dew was off, and the quickness of the grunters in devouring them was worth seeing."

"What breed do you prefer ?"

"That depends. The middle-white is a good all-round pig, though not the best for getting about and roughing it. As you see, I have got a middle-white boar ; also a Berkshire, which I look upon as a pork or butcher's pig. For bacon, in my opinion, the Tamworth is hard to beat."

Ensilage from Poor Land.

PROSPECTS OF DAIRY FARMING.

INTERVIEW WITH MR. JOHN W. MOOR.

By "ERGATES."

THREE years ago Mr. John W. Moor left his farm at Ennersdale, and being chiefly attracted by the bracing climate of the Mooi River district, established himself on a farm four or five miles towards the Berg from the Mooi River Railway Station. He came with an open mind, and resolved to experiment in some directions. It was chiefly to see the result of his experiment in growing mealies on the poor top soil of the upper Mooi River, that I asked him to be good enough to give me an interview. I know the character of the soil of the district, for on one occasion, not many miles from where Mr. Moor is located, I inspected half a dozen acres of land better than his in appearance, and got into first rate tilth, which was sown with mealies. The average height of the mealie crop was, if I remember rightly, about 20 inches, and of cobs there were none. That was before the days of fertilisers, and it is little wonder that farmers in those days regarded only the bottom soils of the district as fit for cultivation. Land such as I have described, and on such as Mr. Moor has conducted his experiment, was looked upon as only really fit for summer grazing. With mealies at 5s. or 6s. a muid, good oxen at about the same number of pounds, full-mouthed wethers at about 12s., and cows regarded only as troublesome, but necessary media for the production of oxen, "intensive" farming had no attraction. All has changed, especially with respect to the cows. The cow is no longer despised; from a money point of view she now stands ahead of the ox in dignity, and it is becoming evident that she must be fed in a manner that never came within the ken of her forbears. Mr. Moor has done much by his experiment to solve this food problem for his own district, and indeed for many other districts in South Africa.

MEALIE ENSILAGE.

The mealie is of all crops the crop for the wet summer climate of Natal, and mealie ensilage, mealie hay, and mealie cob-meal are admitted, all round, to be first-class cow fodder. The mealie growing experiment on the top land appeared to me to be a perfect success. The stalks were fully eight or nine feet in height, and the crop was a very even one. It was purposely planted somewhat late, in order to have it in the best condition for turning into ensilage at the beginning of winter. I would not try this experiment again; it is better to get them in early. The reaping was done just as the corn was getting glazed.

"What fertiliser, and how much to the acre?" I asked.

"Superphosphate, and 2½ cwt., costing 15s. to the acre."

"What kind of mealie?"

"Horse-tooth; I think, at any rate, that is the best class of mealie for stalk, and to get lots of stalk, with a good cob, was one of my chief objects."

"I notice you waste but little stalk; are the short points not dangerous for the feet of oxen?"

"No. When the oxen come in the points will be soft. For cutting we use a sugar cane knife. It is much quicker and better in every way than a sickle."

I took a photograph of the field of hay stooks (which will be published in a future issue), and I think that the heavy crop which it depicts will conclusively show that the poor top soil of this large district is capable of giving a splendid mealie crop if assisted by even so moderate an amount of artificial manure as 2½ cwt. of superphosphate to the acre. The main portion of the crop was already in ensilage stacks. Mr. Moor presses his stacks with earth. Mr. G. R. Richards, who happened to be visiting when we were

talking on the subject of pressing ensilage, observed that he used wattle poles for that purpose. He remarked that besides being handy and giving even pressure, the poles were useful when done with.

Kale, Cabbage, and Cocksfoot.

Close by were other crops for the winter. A field of thousand-headed kale looked well, but it had been planted too late to give the results it is capable of producing. In No. 10, Vol. III., a description was given of a fine crop grown by Messrs. Hutchinson Bros. at Balgowan. This kale should be planted early in December; in the upper Mooi River probably the beginning of November would be the right time. Close to the kale was a field of drumhead cabbage, an excellent, even crop. Considering the enormous price of cabbages in the towns, it is to be hoped that some of them will be despatched for direct consumption instead of being used for conversion into milk.

Adjoining the cabbage land was a big strip under cocksfoot, and in which, at the time, the dairy cows were browsing contentedly. In reply to some questions, Mr. Moor said:

"I think well of cocksfoot for the district. It cannot be considered first-class for topping off stuff for fattening purposes, but as it keeps fairly green for a long time into our winters here, it is an extremely useful adjunct to the other food. Some years ago Mr. McFie, at his Highlands farm, kept, and indeed fattened, 21 sheep to the acre off it; 630 sheep on 30 acres. The sheep find green stuff at the roots of the stools, however frosted the ends may be."

Dairy Farming: Its Profits.

"You seem," I remarked, "fully bent in going in thoroughly for dairy work?"

"Yes. This is good dairy country. At the Creamery the best milk tests come from this neighbourhood. I should like to see the greater part of the Colony filled up with real dairy farmers; men who would go in solely for the business."

"Will you give me an outline of what you mean?"

"I'll try. Let us assume that the man wishing to go in for dairy farming has in capital about £3,000, or can get the use of it in credit or in kind. He should start on, say, 600 acres of cultivatable land, the closer to the railway the better. He should buy fifty or sixty good cows, costing from £20 to £30 per head. The calves he would be easily able to sell when twelve months old, at a figure between £8 and £12. That is what they are now worth. For a good many years to come, I think, he could rely on getting that price for them. As for cultivation, he could put in 35 acres of mealies for ensilage, 10 for mealie hay, and, say, 15 for corn. Ensilage is the sheet anchor for the dairy farmer in winter. He should begin with 20 acres of cocksfoot, but plant a bigger area every year, up to 50 or 60 acres, for it is an excellent early winter standby, and lasts about four seasons. For variety he should grow some thousand-headed kale, cabbage, and carrots, all first-class for winter feeding. With the foregoing, and, say, 30 tons of veld hay, he should be in a capital position to run a dairy business profitably. I know a man with 400 acres, who, from his dairy produce only, is making £40 per month. There is no danger, in my opinion, for several reasons, of cattle going down in value for a considerable time, firstly, owing to the enormous losses during the last four years from pest and war, secondly, to the certain increase in the consuming population; and thirdly, to the fact that the losses cannot be replaced by importation, so far as we at present know, and that Natal cattle have the advantage of being exceptionally adaptable for re-stocking any part of Africa as far as the Zambesi. This class of dairy farmer, and situated as I have described, will send his milk or cream to the nearest Creamery, and, being relieved of the costly trouble attending pasteurisation, churning, etc., will be able to devote the whole of his attention to his real milk-producing business."

"And about his profits?"

"We will say that forty out of his fifty cows calve. At £6 per head, for cream returns we get £240. Then the calves

should fetch at least £300 to £400, or both together £500 to £600. This estimate is very low, for with moderate luck I feel sure that for years to come it would top £700. My cows now are returning me more than the above figures. Then there would be poultry, and he should also go in on a moderate scale for fruit and garden produce. Hiss gross profits should be in the neighbourhood of £1,000."

"What kind of labour?"

"Coolies or natives."

Shelter at Night.

"What about shelter for the cows in this district at night?"

"The subject is an important one, particularly for high veld farms. The expenditure by cows of the food supplied for simply keeping up warmth must be enormous under the present conditions. Open sheds, such as are common, help a great deal, but my opinion is that we should aim at having really good cow-houses, with alley-ways for feeding between the mangers, well ventilated, yet warm. For dairy purposes we do not want breeds specially selected for fighting through hard, starvation winters, but animals that will fill the pails with good milk. Cows for dairy purposes here should get as good treatment as we give our riding horses. My herd is chiefly Friesland. I have just bought an Ayrshire bull, and I mean to keep to the milk breeds, but which will be the best for my farm here I cannot say yet."

A Great Colonial Industry.

"Are people catching on to the dairy farming locally?"

"Yes, particularly among those fairly close to the Creamery. In time I have no doubt that the circle of suppliers will increase. Those at a distance should make mutual arrangements for establishing forwarding centres. This will come, and indeed is coming, but—farmers are conservative. Broadly speaking, I should like to see everything done to foster, or rather to stimulate the dairy industry in its present initial stages, and I am inclined to think that the Colony would do well to follow the example of Canada and other countries, in offering to subsidise creameries for limited periods. The dairy interest should become very valuable to the Colony. The average man does not realise what its importance may be. Take Canada as an instance. That Colony exports every year £4,000,000 worth of cheese, that is to say, just as much as South Africa exports in diamonds. It is a mistake to think that the country fit for dairying in Natal is very limited. I hold, to the contrary, that a very large portion of the Colony is suitable. Every district has its special advantages and disadvantages, and in consequence those who go in for dairy work must study their local conditions, and not blindly follow what others in different districts are doing. Of course dairying on a large scale is new to the Colony. Until recently a farmer's chief object was the breeding of hardy oxen. Now it is to his interest—which I must confess he is somewhat slow to see—to breed cows that will supply lots of milk. From what I can gather from Government statistics and from observation, I feel certain that as soon as times return somewhat to their normal condition, there will be abundance of the raw material, that is, milk, for all the dairy produce the Colony can consume, and to spare."

About Calves.

"Do you have trouble with your calves?"

"No, practically none. The calves run with their mothers the first week. January and February, being the hottest, are the worst months, and when a calf is observed not to be thriving, or is ill from scours, it is run with its mother for a few weeks, and nearly always recovers very quickly. I think it would be a good thing to avoid having calves dropped in those two months. I noticed what Mr. John Marwick said in his interview with you about limiting the calving period to the winter, and about the wisdom of what he said, so far as it applies to districts where the summer mortality of calves is great, there can be no doubt. Here, fortunately, there is no such summer mortality. Summer, however, is the time for

disease. I suppose the temperature is then in its most favourable condition for disease germs, and where they will be thickest is, of course, about the kraals and sheds. A calf a few months old can, as a rule, stand against them, but not so with one newly dropped."

My visit was in the middle of last month. The veld was brown, and garden plants were black and shrivelled up. At the Creamery 19 degrees of frost had already been registered. About the hardness of the winters in the district there can be no doubt, and Mr. Moor, in proving ocularly what can be done with a paltry amount of fertiliser towards making first-class provision for the starvation months of the year, has given a useful object lesson to those who care to learn.

Shepherds Identifying Sheep.

A CORRESPONDENT of the "Agricultural Gazette" states:—"The Wiltshire shepherd is generally bred to the work from earliest infancy, and knows every ewe by sight as well as a huntsman knows his hounds. He soon knows the lambs as well, and this extraordinary power of individual knowledge of the entire flock produces a feeling of wonder in the uninitiated." This I can fully confirm, for the same knowledge as between shepherd and flock prevails amongst the Herdwick sheep which pasture on the mountains in the English Lake district. Some thirty years ago I was present at a preliminary hearing before magistrates for sheep stealing. A farmer's son was the delinquent, and few persons could bring themselves to believe him guilty. Some shepherds were ultimately taken to Barrow-in-Furness, and in the slaughter-houses of the butchers there they picked out both live sheep and the skins of those that had been slaughtered as belonging to the flocks of their employers. When in the witness-box one of the shepherds was under cross-examination, after having given his evidence, by the defending solicitor :—

Solicitor : "What is the number of your flock ?"

Shepherd : "From five hundred to one thousand."

Solicitor: "And do you think the Bench are so foolish as to believe your statement that you can recognise each of those sheep when you see them away from the flock ? Such an assertion is an insult to the magistrates. How do you know them ?"

Shepherd : "How do you know your friends, and how many people do you know ?"

Solicitor : "You have no right to ask me questions ; but to show the folly of your contention, I will answer you. I was born in the district, and know some hundreds of persons, recognising them by their features, of course."

Shepherd : "And I was born amongst sheep, and I know every one of my flock by their features, just as certainly as you know your human friends."

The solicitor tried to ridicule the claim, but the chairman, the late Mr. Montague Ainslie, J.P., D.L., assured him it was correct. The prisoner was committed for trial, and afterwards to a term of penal servitude.

Agricultural Shows.

Lion's River Division. Howick, Thursday, June 27th. Secretary, G. Hutchinson, Balgowan.

Natal Poultry Club. Annual Show, Market Hall, Maritzburg, 1st July. Hon. Secretary, J. Anderson, 272, Longmarket Street, Pietermaritzburg.

Ixopo, Wednesday, July 3rd. Entries close June 22nd. Secretary, A. Keith, Ixopo.

Richmond, Wednesday, July 10th. Secretary John Marwick, Richmond.

Alexandra, Umzinto, Thursday, July 11th. Entries close July 2nd. Secretary, R. G. Archibald, Umzinto.

New Hanover, Wednesday, July 24th. Secretary, H. A. Light, York.

A simple way to tell the age of a fowl, and one which is adopted by practical poultry-dealers, is to feel the breast-bone of the live bird. If the bone feels soft and tender the bird is young ; if, on the other hand, the breast-bone feels hard, ridgy, and not springy, then the bird is not young.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inanda & Ndwedwe	Lungsickness	H. Gillespie ...	Avoca.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein.
		,,	W. Ralfe ..	Ennersdale.
		,,	F. R. Moor ...	Greystone.
		,,	Cooke & Co. ...	Blue Krantz.
		,,	F. Bloy ...	Monte Christo.
		Lungsickness	Toonvani ...	Chieveley.
		,,	A. & W. M. Henderson ...	Elands Park.
J. Button ...	Estcourt, South of Bushman's River	,,	J. Mattison ...	Klipstone.
		Scab	H. E. Kirby ...	Klipfontein.
		,,	A. Lawrance ...	Grantly.
		,,	W. S. Crart ...	Springvale.
		,,	H J. Hurd ...	Weston T'Lands
		,,	J. W. Haw ...	Woodleigh.
		,,	H Albrecht ...	Brynbella.
A. H. Ball ...	Weenen ...	,,	C. P. F. Van Rooyen	Mona.
		,,	G. R. Van Rooyen	Vitoolia.
		,,	R. J. J. Van Rooyen	Bind Spruit.
		,,	,, ,,	Doornkloof.
		,,	L. J. Lotter ...	Waterfall.
		,,	T. J. Van Rooyen	Belle Vue.
		Lungsickness	Secwa... ...	Baviaan's Krantz.
J. J. Hodson ...	Lion's River ...	Scab	Jas. Morton ...	Tweedie Hall.
		,,	A S. Parkinson ...	Shafton Grange.
		,,	D. McKenzie ...	Cotswold.
		,,	J. F. Morton ...	Sherwood.
		Lungsickness	A. Clark & Natives	Mount Ashley.
E. J. B. Hosking ...	Upper Umkomanzi	,,	H. Gillespie ...	Intimbankulu.
		,,	Turnbull & Co. ...	Glen Islay.
		,,	Geo. Hackland & Sons ...	Inhlayuka.
R. J. Raw ...	Impendhle ...	Scab	R. Gresham ...	Castle Howard.
		,,	P. Ogram ...	Tilletudleni.
		Lungsickness	Donga ...	Johnstone.
		,,	C. C. Lewis, and Native ...	Clairmont.
W. Wilson ...	Polela.	,,	H. Eaglestone ...	Coleford and The Bungalow.
		Scab	H. Nicholson ...	Fondling.
		,,	A. W. Leggatt ...	Selbourne.
C. E. Hancock ...	Ixopo ...	Lungsickness	J. H. Johnson and Natives	Dronk Vlei.
		,,	W. W. Walton & Natives ...	Dronk Vlei.
		Scab	Native Pietman ...	Wesley.
		,,	W. K. Anderson...	Maxwell.
		,,	E. S. Clarke ...	Carr End.
		,,	Malambula ...	Location.
		,,	Qinisani ...	Klipgat.
		,,	Solibamba ...	Lufafa.
		,,	R. Kennedy ...	Cornhill.
		,,	G. Thomson ...	Cromwell.
		,,	A. Watson ...	Rosehill.
		,,	Archibald & Co. ...	High Flats.
		,,	W Gray ...	Helmsley.
		,,	Momololo ...	Umgodi.
J. F. Bernard ...	Newcastle	Lungsickness	A. A. Osborn ...	The Mount.
		,,	Native Shallos ...	River View, Ingogo.
		,,	G. L. Fraser ...	Ingogo.
		,,	J. F. Grant ...	Hilldrop.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	J. Mortimer ...	Try Again.
		,,	P. W. Dept. ...	Newcastle T'Lands
		,,	S. Loxton ...	Lennoxton
		,,	D. Dewar ...	Newcastle T'Lands.
		,,	W. A. Ross ...	,,
		,,	Neborasing ...	,,
		,,	— Roberts ...	,,
		,,	C. Watson ...	River Bend.
		,,	H. James ...	Kalbaslaagte.
		,,	J. R. Watt .	Horn River.
		,,	G. Matthews ...	Shakespeare.
		,,	H. Loxton ...	Lennoxton
		,,	A. & S. J. James ...	Paradise.
		,,	Natives ...	Hope Farm.
		,,	— Flemming ...	Newcastle T' Lands.
		,,	Vinnecombe & Robson ...	Lennoxton.
		,,	W. R. Bowes ...	Endsell.
		,,	F. Watson ...	Greenwich and Mountain View.
		,,		
		,,	G. E. Jubber ...	Brackfontein.
		,,	Digeto ...	Rooi Point.
		,,	J. E. Calf ...	Chelmsford.
			R. Dann ...	Yarl.
		,	W. L. Oldacre ...	Nil Desperandum.
		,,	A. J. Crawford ...	Newcastle T'Lands.
		,,	C. Collyer ...	Stilazie's Kop.
		,,	W. Adendorff ...	Hope Farm.
		,,	N'castle Corporation	Newcastle T'Lands.
		,,	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		,,	J. W. Goodwill ...	Cornwall.
		Scab	C. de Wet ...	Schuinshoogte.
		,,	H. S. Dicks ...	Lennoxton.
		,,	A. J. Middleton ...	Ingogo.
		,,	W. E. Few ...	,,
		,,	F. Johnstone ...	Craig.
		,,	Umkwenesi ...	Alcock's Spruit.
		,,	J. Dicks ...	Vet Klip.
		,,	F. R. Tewson ...	Rooi Point.
		,,	W. A. Lang ...	La Belle Esperance.
		,,	J. Vanderwesthuise	Hartebeestelaagte.
		,,	W. C. F. Napier ...	Eagles Cliff.
		,,	J. A. Vanderplank	,,
		,,	A. P. de Jager ...	One Tree Hill.
		,,	G. J. Way ...	Vrede.
		,,	J. W. O Reilly ...	Gordon.
		,,	H. P. Beare ...	Ingogo.
		,,	J. Matthews ...	Shakespeare.
		,,	O Schwikkard ...	Boscabelli.
		,,	G. Star ...	Lennoxton.
		,,	R. S. Miller ...	Goloch.
		,,	W. C. F. Napier...	Newcastle T'Lands
		,,	C. G. Palmer ...	Dry Cut.
		,,	P. L. Uys ...	Jackalspan.
		,,	W. Dicks ...	Hope Vale.
		,,	S. J. James ...	Stafford.
		,,	J. W. Shuttleworth	Duck Ponds.
		,,	S. W. Reynolds ..	Newcastle T'Lands.
		,,	W. L Jee ...	Lennoxton.
		,,	J. Davidson ...	,,

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	H. S. Dicks & Sons	The Retreat.
		,,	Native Funwayo...	Tigerkloof.
		,,	Umbobo & Lugudu	The Garden.
		,,	Umgodini ...	J. Adendorff's farm Ingagane.
		,,	Kotshaindoda ...	N. Dugenaar's farm, Ingagane.
		,,	J. W. O'Reilly, Natives Jonas, and Paplana	Newcastle T'Lands.
		,,	L. H. S. Jones ...	,,
		,,	J. Hodgson ...	Belvedere.
		,,	Bob. Salugwanda	Boschhoek.
		,,	A. Nottman ...	,,
		,,	P L. Uys ..	Jackalspan.
		,,	T. Breary ...	Newcastle Colliery.
		,,	J. Davidson ...	Lennoxton.
		,,	A. Danks & Fox...	Crown Colliery. Newcastle.
		,,	Beckeroo ...	Lennoxton.
		,,	J. Smith ...	,,
		,,	-- Sheikamier ...	Newcastle.
		,,	A. Paine ...	Mount Prospect
		,,	F. W. Hatley ...	,,
		,,	E. Parker ...	,,
		,,	Ramsaroop ...	Newcastle.
		,,	G. J. Way ...	Vrede.
		,,	Unjopal & Eseresing	Newcastle.
		,,	A. H. Tatham ...	,,
		,,	J. W. James ...	,,
		,,	G. Brown ...	Wykom.
		,,	Macdonald & Kemp	Lennoxton.
		,,	Natives ...	Whykombe.
		,,	,, ...	Droog Plaats.
		,,	J. Pettigrew ...	Newcastle T'Lands.
		,,	A. Krause ...	Filexton.
		,,	G. W. Nourse ...	Rutti & Highton.
		,,	Simeon Ndhlovu	Freda.
		,,	— Hodgson ...	Newcastle T 'Lands
		,,	S. W. Reynolds ...	,,
		,,	O. Olver ...	,,
		,,	D. S. Redman ...	Snipe Marsh.
		,,	R. T. H. Harrison	Lennoxtown.
		,,	F. Ferrier ...	Henley Farm.
		,,	G. W. White .	Ruth.
		,,	C. R. Savory ...	Pomeroy and Evin.
		,,	Dr. Ormond ..	Ingogo.
		,,	Seikomya Datuz	Newcastle T'Lands.
		,,	Loxton & Rudd	Waterfall.
		,,	L. C. Koch ...	Kabbaslaagte.
		,,	D. Miller ...	Roseless
		,,	H. Singleton ...	,,
		,,	E. Graham ...	,,
		,,	Cooper & Chandley	Newcastle T'Lands.
		,,	Blizzard & Pratt	Ingogo.
		,,	J. W A. Welsh ...	Paradise.
		,,	— Hanstin ...	Wykom.
		,,	J. G. Kemp ...	Heighton.
		,,	G. Star ...	Lennoxton.
		,,	G. Wood ...	Heron's Court.
		,,	W. L. Lea ...	Lennoxton.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
F. J. Bernard ...	Newcastle ...	Scab	A. J. Debenham...	Knowsley.
		,,	G. Wood ...	Heron's Court.
A. S. Parkinson ...	New Hanover ...	Lungsickness	E. Boast ...	The Avenue, York.
A. Hair	Umgeni and Borough of Pietermaritzburg	,,	T. Dawson ...	Zwartkop.
		,,	C. Oldfield ...	Wilgefontein.
		,,	H. H. S. Moreland	Maudstene.
		,,	W. Oldfield, Natives	Ambleton.
		,,	Jonas	Slangspruit.
J. Chaplin ...	Klip River	,,	Discharged Transport Cattle	Matowan's Kop.
		,,	W. J. Tully ...	Grobelar's Kloof.
		,,	A. H. Spring ...	Reserve.
		,,	W. Cochrane ...	Aller Park.
		,,	A. Armstrong ...	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ...	Grobblar's Kloof.
		,,	Natives ...	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,,	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	J. A. de Waal ...	Blau Bank.
		,,	J. P. Buys ...	Reit Kuil
		,,	Pepworth & Reid	Reitfontein
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein
		,,	Natives ...	Weltervreden
		,,	J. Peniston ...	Reserve
		,,	W. M. Tollner ...	Weltervreden
		,,	J. Van Whye ...	Ladysmith T'Lands
		,,	G. J. Heslop ...	,,
		,,	H. E. K. Anderson	Gedula.
		,,	J. F. Rethman ...	Georgina.
		,,	Natives ...	Reit Kuil.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	G. F. & J. Woodhouse	Davel's Hoek.
		,,	Natives ...	Georgina.
		,,	,, ...	Zwaart Kloof.
		,,	G. J. McDuling ...	Waterford.
		,,	Natives ...	Langverwatht.
		,,		Vertrek.
		,,	Nondo Gama ...	F. J. Dewaals' farm
		,,	A. Boers, & Native	Marais Vel.
		,,	W. Neizel, & Natives	Roosboom.
		,,	Natives ...	Doornkraal.
		,,	E. Walker ...	Doornkloof.
		,,	J. Umpbleby ...	Springfield.
		,,	F. N. Nel ...	Catherine.
		,,	Natives ...	Macpherson'a farm.
		Scab	J. H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson ...	Walker's Hoek.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	G. M. Rudolph ...	Reit Kuil.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	E. F. Gibbons ...	Plaat Berg.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Scab	J. G. Nel ...	Femie's Kraal.
		"	G. Wetherill ...	Walker's Hoek.
		"	A. C. Beyers ...	Vaal Krantz.
		"	A. Krogman ...	Brakfontein.
		"	M. W. Krogman...	Dreifontein.
		"	P. Marais ...	"
		"	H. Boers ...	Dew Drop.
		"	G. Spearman ...	Feir View.
		"	A. C. Harding ...	Waterford.
		"	J. Van Reenen ...	Wessel's Nek.
		"	A. Boers ...	Marais Vel.
		"	C. W. Denhill ...	Washbank.
		"	J. A. Dryer ...	Spion Kop.
		"	A. Carbutt & J. Good	Natiwaan's Hoek.
		"	Sparks Bros. ...	Ladysmith.
		"	J. de-Waal ...	Blaubank.
		"	F. J. de-Waal ..	Lombard's Kop.
		"	G. Innes ...	Eland's Laagte.
		"	J. Umpleby ...	Springfield.
		"	A. J. Taylor ...	Arnot Hill.
		"	R. Horsley ...	Warrock.
		"	D. Helps ...	Roosboom.
		"	Corrigel ...	Koolfontein.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	- Spence ...	Reunion Estate.
		"	H. F. Pearson ...	Everton.
		"	W. Caldwell ...	Stamford Hill.
W. Freer ...	Upper Tugela ...	"	J. W. Coventry ..	Rangeworthy.
		"	Mr. and Mrs. C. C. J. Bester	Bester's Hoek.
		"	W. Freer ...	Acton Homes.
		"	W. O. Coventry ...	Acton Homes.
		"	G. H. H. Coventry and Native	Rangeworthy.
		"	J. Reed ...	Roode Bent.
		"	Borbasee ...	Vrom Draai.
		"	S. Sharratt ...	Klein Waterfall.
		"	Natives ...	Green Point.
		"	C. H. Williams, & Natives ...	Kroom Draai.
		Scab	J. Scheepers ...	Sand Drift.
		"	G. H. H. Coventry	Rangeworthy.
		"	J. M. Wales ...	Fairleigh.
G. Giglink ...	Zululand ...	Lungsickness	M. Titlestad ...	Ntingwe.
		"	Dinizulu ...	Hlabisa District.
		"	Noiwana ..	Nqutu.
		"	Natives' Cattle ...	Melmoth.
		"	Sebambindoda and Natives ...	Kwamagwaza.
		"	G. Havemann ...	Insuzi.
		"	Military Loot Cattle	Warbeck, Elizabeth, and Barneveld Melmoth.
		"	Damusa ...	near Melmoth.
		"	Ndabazeywana ...	Nqutu.
		"	Strachan ...	"
		"	Jacob ..	Vant's Drift.
		"	M Bube ...	"
		"	Surrendered Boers	Hlabisa.
		"	Lufahla Usutu ...	Nqutu
		"	F. W. White ...	Melmoth.
		"	Havermann	Ukandhla.
		"	J. G. Vanderwesthuyse	Ukandhla.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
G. Gielink ...	Zululand ...	Lungsickness	G. Muller ...	Near Melmoth.
		,,	C. Green	Inyoni.
		,,	J. Wantick	Eshowe.
		,,	Liversage & Van Rooyen ...	Umhlatuzi.
		,,	Surrendered Boers	Eshowe
		,,	Mtantana ...	Telezi Ridge, Nqutu
		,,	Mhlamb ...	Sihlunegwana Hill.
		Scab.	H. T. James ...	Prospect.
A. Klingenberg ...	Umsinga ...	Lungsickness	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
		,,	Combrink Bros. ...	Uithoek.
		,,	Mrs. H Strydom...	,,
		,,	Ngobazane ...	Vermaak's Kraal.
		,,	Usiq antjee ...	Emsita.
		,,	James Fuli ...	Umsinga Location.
		,,	A. Müller ...	Pression and Buffalo Home.
		,,	M. Shebele ...	Freiburg.
		,,	Dr. J. Dalzell ...	Gordon Memorial M.S.
		,,	H. Steyn ...	Craigneathen.
		,,	H. Dedekind ...	Buffalo Home.
		,,	T. Keyter	Pomeroy Town Lands.
		,,	T. Crooks	
		,,	Botha	
		,,	Westbrook Bros.	
		,,	N. Smit ...	Tugela Ferry
A. J. Marshall ..	Dundee ...	,,	Marshall Bros. ...	Cleveland.
		,,	— Dammann ...	Celle.
		,,	— Frockling ...	Henning.
		,,	W. Muller and C. Hellberg	Karlsburse.
		,,	— Schroeder ...	Schroeder's Hope.
		,,	do. ...	Rosenen.
		,,	— Haynes ...	Sterkstroom.
		,,	Military Authorities	Maypole.
		,,	A.F. Henderson...	Brazil.
		,,	— Stoffel ...	,,
		,,	— Ohlsen ...	Craigside.
		,,	Umquayo ...	Sweet Home.
		,,	Glutz ...	Rocky Glen.
		,,	Thorn ...	,,
		,,	D. Oppermann ...	Gedull No. 2.
		,,	— Botha ...	Jackalsfontein.
		,,	Cooper & Umbleby	Dundee.
		,,	Redman ...	,,
		,,	Natives ...	Craigieburn.
		,,	Cooper & Umbleby	Domain.
		,,	A. A. Smith ...	Dundee.
		,,	Redman & Nourse	Craigside.
		,,	J. Landman ...	Boschfontein.
		,,	J. Davidson ...	Beacon Hill.
		,,	Natives	Long Land.
		,,	J. W. Goodwill ...	Keloin.
		,,	,, ...	Carolina.
		,,	,, ...	Revier.
		,,	L. Hedder & May	Roadside.
		Scab	—Hearn ...	Hatting Spruit.

RETURN OF FARMS AT PRESENT UNDER LICENCE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ...	Dundee ...	Scab	J. W. Marshall ...	East Lynn.
		,,	– Ohlsen ...	East Lynn.
		,,	D. Meumann ...	Dundee.
		,,	A. & P. Conyers ...	Rest.
		,,	Natives Sheep' ...	Maypole.
W. A. Hutchinson	Alfred ...	,,	W. Stafford ...	Sutherland.
		,,	Nqubu ...	Location.
		,,	Ngihla ...	St. Mary's.
		,,	Mpapu ...	Location.
		,,	Camulana ...	,,
		,,	Manxolo ...	,,
		,,	Nakubana ...	Amaci Location.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	Faku ...	Mount Alice.
		,,	A. C. Beyers & Sons	Doveton.
		,,	Natives ...	Hungerspoort.
		Scab	J. Lawford ...	Emmadale.
		,,	G. Spearman ...	Woodlands.
		,,	J. H. Beyers ...	Doveton.
E. Varty ...	Umvoti—Western Portion	,,	H. Hansmeyer ...	On Rust.
G. N. Perfect ...	Umvoti—Eastern Portion	,,	L. J. Nel ...	Welgegund.
		,,	J. A. Nel ...	,,
F. E. Van Rooyen ...	Kranzkop ...	,,	L. J. Potgieter ...	Broedershoek.

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand. have been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
5th June, 1901.

M. J. HIME,
for P. V. Surgeon.

Redwater or Tick Fever.

THE following are the concluding remarks of Dr. Tidswell's report on tick-fever or redwater to the Government of New South Wales :—

Dipping.

The only way in which cattle can be aided in their struggle against the ticks is by removal of the ticks. Change of pasture is little use since the new pasture very soon becomes as bad as the old. In dairies, or in the case of specially valuable beasts, the ticks may be reduced in numbers by mechanical removal by hand, followed by washing and smearing. Preliminary clipping is useful under these circumstances ; but, in general, the only practicable method by which infested animals may be given the chance of overcoming the parasitism of ticks is dipping. The value of dipping at the present time is precisely that stated in my previous report. It can "rarely be so conducted as to ensure the destruction of every tick on a beast," but "the removal of the bulk of the ticks affords the relief, albeit temporary, necessary to enable the animals to regain sufficient vigour to make an ultimate recovery." The fears formerly entertained that repeated dipping injures the cattle have been proved to be groundless, and now-a-days dipping is repeated every six or eight weeks, or according to circumstances.

The composition of dips, especially as regards the inclusion of arsenic, is still a disputed question. The difficulty has

been to find a dip which will kill ticks and not injure cattle. In America success is reported to result from the use of "extradynamo" oil saturated with sulphur, and used so as to entirely fill the dip, no water being added.

So far as I am aware, no systematic experiments on dipping have been conducted in Australia. Though it would probably be expensive, such work is much needed; for since inoculation affords protection against tick-fever, the weakest point comes to be our defencelessness against the parasitism of the ticks. At the present time the most pressing desideratum of the tick question is the discovery of a means of destroying ticks which will at the same time be innocuous to cattle.

Remote Effects of Inoculation.

As the inoculation illness and its immediate effects have been described in my previous report, it is only necessary here to briefly refer to the subsequent health of the cattle. The animals retained under observation at North Head after inoculation all remained perfectly well during the period of sixteen months covered by the experiment. Neither the relapses nor chronic ill health described as sequelae of natural tick-fever appeared in any of them. The three animals under my immediate supervision were all dairy cows. They were milked regularly when in milk, fed mainly on lucerne, and in other respects treated in the ordinary way. From being originally poor and thin, they became fat, sleek, well-looking beasts, and two of them gave birth to healthy, well-nourished calves. The animals sent to the North Coast districts have had a much less peaceful time, and have been travelling at intervals. I am informed they have not done so well, but have remained free from sickness of any kind which could be regarded as the result of their inoculation. Two of them have calved.

Our observations go to show that inoculation is not necessarily followed by any deterioration of the general health, and that after recovery from the operation the animals differ from uninoculated animals neither in appearance nor vigour. The profound change which has resulted from the inoculation only becomes revealed when the animals are reinoculated or exposed to ticks, or when their blood is used to inoculate other animals.

Inoculated Animals resist second attacks.

I have never personally observed a second reaction in inoculated animals, although I have reinoculated different animals at intervals of six, eight, ten, and twelve months after the first (reacting) inoculation, and the blood used always produces reaction in controls. The protection against reinoculation has remained perfect in every such case coming under my direct notice. It has been reported to me that second reactions were observed in the course of the inoculations carried out in the North Coast districts. They only occur occasionally, and always to young animals. The conditions under which the inoculations in question were performed precluded detailed investigation of the causes underlying this unusual feature of inoculation.

Fourteen of the North Coast animals were all treated with the same bloods, at the same time, &c., but on exposure to the ticks exhibited great variation in resistance to tick-fever. No. 48 escaped attack; No. 25 had a slight attack; Nos. 15, 16, 27, 43, 55, 57, and 62 had moderate attacks; Nos. 19, 22, 51, 54, and 61 had high fever; whilst No. 22 died. It will be seen, then, on the one hand, that in certain animals the resistance was equally perfect although the inoculation treatment had been different in each case, and on the other hand, that in certain other animals the resistance exhibited was very different, although the inoculation treatment was the same in each case. Further examination of the data failed to reveal correspondence between any special feature of inoculation and the amount of resistance obtained. The issue appeared to depend more on the individual peculiarities of the animals than upon anything under human control.

The observations indicate that inoculation may be indulged in without fear of permanently injurious consequences, provided, of course, that it be carried out intelligently and with a reasonable amount of care. They also tend to show that the

details of the procedure are matters of secondary consideration ; the one essential thing is to make sure that the animals have been adequately inoculated. Our one guide is to produce a reaction, such as will protect against reinoculation ; and provided this be done, little significanee would seem to attach to its particular features or mode of production.

In arranging for the inoculation of herds it is desirable to have a suitable bleeder on the spot, and to use the blood as soon as possible after it has been shed and defibrinated ; but if for any reason this cannot be done, the inoculations may be performed with blood transmitted from a distant plaee or station. The possibility of thus transporting blood was first pointed out some years ago by Mr. Barnes, M.R.C.V.S., of Rockhampton. As an indication of what may be done in this way, I venture to insert here some observations made during the course of our experiments.

Our initial inoculations were performed with blood sent from Brisbane to Sydney, the interval elapsing between the bleding and the inoculation being three days. The animals inoculated exhibited refractory reactions, were immune to reinoculation, and, although getting tick fever, did not succumb when exposed to ticks at Greenfell, and were not worse than many animals inoculated with recently shed blood. The same sequence of events oecurred in relation to a second sample of blood obtained in the same way. A sample of blood sent from Grafton to Sydney, used after an interval of four days, produced a good reaction in the animal inoculated with it.

With the idea of obtaining some guide as to the length of time blood would retain its infectivity after being shed, the following experiment was performed :—

Blood was taken by Mr. Stewart from three animals at Rockhampton — one inoculated, and two controls. Some sent to Mr. Archer, and used three days after collection, produeed good reaetions in all animals inoculated. Some sent to Mr. Pound at Brisbane, and used two days after collection, produced good reactions in all animals inoculated. Some sent to me in Sydney, and was used five days after collection, but of the three animals inoculated only two exhibited a very slight reaction. Thanks to the courteous assistance of Mr. Archer and Mr. Pound, we were thus in possession of faets which indieate that the infeetivity remains in shed blood for between three and five days.

It must be stated, however, that in the various observations just mentioned, the colleetion and transmission were eonducted by specially skilled individuals in such a way as to materially lessen the chances of putrefaetion. In less expert hands, and with faulty methods, the blood might beeome putrid within the times above mentioned. It need scarcely be said that the slightest taint makes the blood utterly unsuitable and dangerous. As a practical rule, it may be taken that transmitted blood should not be relied upon when it has been more than two days on its journey.

Conclusion.

The conclusions arrived at in my previous report, based to some extent on the observations of others, can now be reviewed in the light of our own subsequent experience, reeorded in this report.

The need for maintenance of the first line of defence there indicated—viz., the exclusion of tick-infested eattle, with compulsory erush inspeetion and dipping of possibly infested beasts—is afforded the strongest support by the faets eoncerning cattle ticks presented in Part V. of this report. It is obviously our best policy to spare no efforts in keeping the ticks out of the Colony as long as possible. The recent success of the Government in seeuring the continuance of an adequate buffer area is a matter upon which the responsible authorities are to be warmly eongratulated.

The conclusion previously arrived at as to the value of inoculation is also borne out by the more recent observation recorded in Part VI. of this report. It is plainly evident that, although the protection conferred by inoculation may not be perfect, it is yet such as to be of very great service in reducing the ravages of tick-fever. The difference between inoculated and control animals observed at Greenfell were really more obvious to the

eye than I can hope to express by description, it was quite easy to distinguish between the two by merely noting the appearances presented. The inoculated animals sometimes looked sick to the skilled observer, but their condition was a mere nothing in comparison with the woebegone, wretched-looking controls. The facts given, tables, and discussed in the report, clearly exhibit the reasons for the differences, and are eloquent witnesses to the value of inoculation.

It is unfortunate that our efforts to obtain guidance as to the possibilities in the way of perfecting the protection were not attended with much success. We found no single detail of inoculation exerting special influence over the amount of resistance to tick-fever subsequently exhibited. The hope that imitation of the sequence of events by which immunity is acquired by nature, i.e., repeated inoculations, would prove effective, has not been realised—not, at least, with respect to any repetition that could be regarded as within the limits of practicability. Upon the question of the influence of time in reducing the protection, the results were also indecisive ; but, at least, they do not indicate any deterioration that seriously detracts from the value of inoculation.

Work in another direction was attended with a more definite outcome, since a certain amount of information has been obtained as to the precautions to be observed in performing inoculation. If I may be permitted to say so, the facts recorded in Part VI. B, concerning the selection of bleeders, are well worth the attention of those who propose to engage in the practical application of the method. I would lay particular stress on the necessity for checking the infectivity of the blood upon every occasion that it is used. We cannot depend on bleeders for an indefinite time; we cannot secure the continuance of the infectivity of their blood; consequently we must satisfy ourselves that it does actually produce reactions whenever it is used to obtain protection. Neglect of this precaution is apt to deceive. It has happened, more than once, that an unsuspecting owner, having injected his herd with blood believed to be suitable, and having thereby acquired a false sense of security, has met with a rude awakening when the ticks invaded his cattle. In some such cases the method has been loudly condemned as valueless ; whereas, in reality, the herd has never been inoculated against tick-fever.

The importance attaching to the provision and maintenance of animals whose blood is of a suitable kind, suggests the desirability of establishing convenient centres at which an adequate supply of properly "salted" cattle could be kept up under the supervision of competent individuals.

Although there can be no doubt that inoculation is a very valuable safeguard against tick-fever, opinions differ as to whether we, in this Colony, should inoculate at once, or postpone operations until the nearer approach of the ticks. It must be admitted that the pros and cons are such as to prohibit any dogmatic statement in favour of either plan, and all I venture to do is to give expression to my own individual opinion for whatever it may be worth.

It appears to me that in the first place one has to decide whether one's cattle are or are not exposed to risk. I should consider any place to or through which cattle from suspected country directly pass as liable to the possibility of tick infestation, and other places as free from the danger of being taken unawares. The immediate decision as to inoculation need only be made in respect to the former, since ticks will not spread all over the country at a jump, and may be expected to appear first at places on the lines of transport. But, even were I so situated that my cattle were exposed to risk, as above defined, I would still prefer not to rely exclusively on either one of the two plans suggested, but to use them in combination. I would have no hesitation in inoculating my cattle at once, but I would certainly also reinoculate them when the ticks came to close quarters. In breeding herds, inoculation would necessarily become something like an annual event, since it would be necessary to treat each year's young stock. Under these circumstances I

should be inclined to put all cattle through the process every year. Of course, the question of expense has to be considered, but perhaps the outlay would be justified by the feeling of satisfaction that everything possible had been done to secure the protection of the cattle. At places other than those on or near direct routes, inoculation may, I think, be safely deferred until the appearance of ticks at some place with which they are in communication; but matters should be in trim so that inoculation may be at once proceeded with should occasion arise, i.e., salted stock should be at hand.

The foregoing conclusions concerning inoculation may be briefly summarised in the following terms:—

1. The question of inoculation need only be considered at the present time by stockowners in districts to or through which cattle pass from districts actually or possibly tick-infested.
2. In such districts owners whose cattle are situated on or near direct routes, would be taking the safe course in inoculating at once, but should inoculate again on close approach of the ticks. Owners, whose cattle are well outside direct routes, need not inoculate at present, but should maintain a sufficient number of properly salted cattle to enable them to immediately inoculate their whole herd should the ticks appear at any place in direct communication with them.
3. As it is above all things necessary to make sure of the suitability of the blood used for inoculation, it may be advantageous to establish convenient centres at which a supply of suitable cattle can be constantly maintained under the supervision of competent individuals.
4. The question of erecting dips is not a matter of urgency at the present time, except at the border crossing-places, where they should be erected and systematically used for the cleansing of travelling stock of all kinds.

Finally, I may point out that the foregoing conclusions do not differ in any essential respect from those arrived at in my previous report:—"We should energetically maintain our border defences, and we should set about rendering our internal position as secure as possible by inoculation and reinoculation of our cattle. The young stock should be inoculated at once, and the old stock later on, if necessary." If I now extend the operation so as to include all cattle, it is from a conviction that with reasonable care the operation is harmless, and, therefore, may be practised upon all. Nevertheless, I still regard the inoculation of all cattle, and of beasts destined for early slaughter, as a matter which may be left to the discretion of the owner; hence, I may fairly say that the above-quoted recommendations express my views at the present time as adequately as when they were written twelve months ago.

In the *Farmers' and Fruit Growers' Guide* (4th edition), page 51, Mr. Guthrie explains how to convert small quantities of bones into super phosphate, and that is probably the best and most economical way of treating them. But to carry out the process involves some little difficulty, especially to persons unaccustomed to handle stuff like sulphuric acid. An easy method of treating them is to make a sort of compost heap, putting a layer of six inches of bones, then a layer of three inches deep of quicklime, and on the top of that spread loam to the depth of four inches. Repeat the layers until the heap is complete, and then cover it all over with a good thick layer of fine soil. Holes should then be made right down through the heap, and water poured in to slack the lime. The mass will become hot, and at the end of about three months the heap will slice down like cheese, and the material, in the shape of a substantial fertiliser, can be applied to the land, where a great variety of crops will readily assimilate it.

A colonial correspondent of the *Times* writes urging that the War Office should buy more horses in Australia. He suggests that the hardy and compact stock horse of 15 hands or 15 h. 2 in., used on the cattle ranches, are just the stamp required for compaigning; they do not know what pampering means, and are used to doing their eighty miles a day without being any the worse. In Queensland, he says, breeders would be content to accept from £12 to £15 per head for four-year-olds; but what these horses would cost after the journey down to Brisbane and transport to the Cape is another thing. The same writer thinks that the Army buyers who have purchased horses in Australia for South Africa made a mistake in their choice; they gave preference to the big, upstanding, and showy horse, which is good to look at, but too soft for bush work; and, therefore too soft to withstand the hardships of campaigning.

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CONTENTS.

The Rinderpest Outbreak.

THE Principal Veterinary Surgeon gives the following particulars of the outbreak of rinderpest in Sobuza's Location situated in the Umvoti Valley, some twenty miles distant from Greytown. The disease appeared amongst the cattle of two Natives. As is frequently the case, the first animals to die were supposed to have suffered from gallsickness, and it was not until several days later, when an extension of the disease had taken place and several more deaths had occurred, that the significance of the malady was recognised. Advice was then sought from Mr. Koman, a storekeeper, and he considered the matter sufficiently serious to bleed a beast known to have recovered from rinderpest in 1896, and with this blood to inject all the young animals at the infected kraal. The cattle of the second kafir had been obtained from the first kafir as *lobola*; all (three) have died from the disease. There is no doubt as to the nature of the disease, the symptoms during life and the *post-mortem* appearances being typical of rinderpest. Immediately on arriving at this decision the veterinary authorities wired the police to form a cordon round the infected area. All animals, with the exception of those to be used for the production of an immunising serum, were destroyed. A veterinary surgeon was stationed on the spot, and the immunisation of the surrounding cattle was at once commenced with a supply of serum which had been preserved, in view of any such possible occurence, since the epi-

demic of 1896. In this way it is hoped that a barrier will be opposed to the further progress of the disease. Such process will, of course, be free from the grave objection attaching itself to the use of bile, serum being free from the possibility of introducing the infection, and at the same time the immunity which is conferred is established within a few moments, and not, as in the case of bile, until the lapse of ten days. In the meanwhile, cattle undoubtedly salted are being rapidly fortified with virulent blood, taken from one of the sick beasts, in order that a potent and reliable serum may be available for checking any extension which may unhappily occur. No virus will of course be used in immunising the surrounding stock; they will, therefore, in the strict sense of the word, be "immuned," but not salted. It has been ascertained by European workers with the serum that the immunity produced by good serum equals in point of time, if it does not exceed, the length of immunity conferred by a bile injection.

Experimental Farms.

AN AMERICAN EXPERT.

MR. G. M. ODLUM, B.Sc., from Michigan, U.S.A., who has been engaged to start Agricultural Experiment Stations in Rhodesia, has been devoting a few days to the study of agriculture in this Colony. Mr. Odlum was good enough to sanction the publication of the following observations which he made on experimental farms in America:—

"By next spring," he said, "I hope to start two or three orchards of about 3,000 trees in Mashonaland. I shall have 300 varieties of fruit trees, and in each of the orchards ten of each variety will be planted. In this manner we should get at reliable information as to the kinds of trees which do best, as to how they are affected under different conditions of soil, climate, and altitude, and as to how they do cultivated under irrigation, or 'dry farming' as we call it. There will also be some experimental growing of mealies. I have about two dozen American varieties for trial. In America all advanced men are great cultivators. Mealies get cultivation every week. The crop will receive, say, seven or eight cultivations. The two top inches of soil will be as fine as dust, and not a weed will be seen. Our properly-managed orchards are absolutely free from weeds.

"Experimental agriculture is conducted by nearly all the American States. Each State will have from one to five Experimental Stations, and each State has its Director, supported by a staff of from ten to forty. The staff will include bacteriologists, agriculturalists, entomologists, dairy experts, poultry experts, live stock experts, horticulturists, botanists, mycologists, veterinarians, zoologists, soil experts, agricultural chemists, and so on. All the work is specialised, so there is practically no useless overlapping. Each station has its manager for the field work, and his subordinates. At first—some 30 years ago—farmers were sceptical as to the advantage they could derive from researches and demonstrations in scientific agriculture, but all scepticism or jealousy is long gone by, and the Legislatures of many States are ready to vote more money for educational agriculture than is required.

"The success which has attended the institution of these centres for scientific research and for scientific and practical education has been enormous. The monetary returns have been a thousandfold, and these results are interestingly proved by elaborate statistics annually published by the various States. Take California for instance. There the fruit industry has been twice rescued from destruction, and thus the State has benefited to the extent of millions of pounds. In Michigan the fruit industry was also saved from destruction, and here, also, the introduction, after years of experimental research, of new wheats, has resulted in increasing the yield from the same acreage by one million bushels. In Carolina a fungus

disease threatened ruin to the cotton industry. Happily a man working at an experimental station succeeded in discovering a remedy, and the industry was saved. In Mexico and California the date-palm and Smyrna fig, after long study of the local conditions necessary for them, have been successfully introduced. And so also it has been with innumerable other but less striking matters in agriculture generally."

Mr. Odlum graduated at the Michigan State Agricultural College. He is appointed Special Agent to the U.S.A. Department of Agriculture for South Arrica. From what he has seen of Natal agriculturally, he is very favourably impressed with its possibilities.

"Modern Dairying."

IN this issue appears the final instalment of the pamphlet on "Modern Dairying," by the Government Dairy Experts of Victoria, and lent by the Hon. F. R. Moor for reproduction in the *Journal*. All who take interest in dairying will find in it much valuable information, and most matters of doubt on details will be easily solvable by reference to the reproduced pamphlet. At the end of the pamphlet is given a list of the Victorian creameries; they number about 500—Natal at the present date has two. The concluding portion deals with silage. It will be noticed that the writers advocate ensilage making without reserve. Natal also has ensilage enthusiasts, and the views of several have at times appeared in the *Journal*. In the paragraph "Crops for the Silo," there is a remarkable statement about a Mr. Lamb, who makes into ensilage 10,000 tons of grass, and keeps a bullock for twelve months in good condition at a cost of 8s. 9d. and a sheep for 1s. 9d. on ensilage. For various reasons preference is given to the stacking of ensilage in Natal. In the paragraph "Stack Ensilage," it will be seen that the writers of the pamphlet, while preferring constructed silos, have little to say against the stack system.

Manna.

WITH reference to manna or millet—the growing of which was strongly advocated in the last *Journal* by Mr. Arthur Koe, Estcourt — it may be of interest to state that the Department disposed of 260lbs. seed last autumn to four farmers. Attempts to get more seed were, owing to the war, unsuccessful. Manna, previously to the war, readily sold on the Johannesburg market at about 10s per cwt., a very remunerative price considering the heavy return it gives per acre. In connection with the subject of millet growing, the following, which is extracted from the seed catalogue of Messrs. Anderson, Sydney, may prove interesting :—"Johnson Grass (Sorghum halepense), or Evergreen Millet, 1s. 6d. per lb.; 28lb 1s. 3d. Special quotations for large parcels.—One of the best fodder plants we have, though, while it is known as Johnson Grass, it is in reality a millet, and is being sown largely on the poorer pasture lands of the Colony, where it has proved invaluable during periods of drought, yielding a large amount of fodder. It spreads rapidly even on poor land, its runners sending up a shoot at every joint. For this reason it should not be sown on cultivated land or in the garden, as if once introduced it is almost impossible to eradicate it. Its remarkable adaptability to all sorts of soil, however, and its resistance to drought, render it most valuable. It can be cut three times a year, and it will give 5 tons of hay per acre. The best time to cut it for that purpose is when the plant comes into bloom. Sow and cover lightly 10 to 15 lb. per acre. Sow during spring ; it will not stand frost."

Irrigation.

COLONEL CORBETT, the Irrigation Expert, will complete his term of two years' service with the Natal Government about the middle of November. Any one wishing to consult him should therefore apply without delay. No fee is charged for this officer's services. Application should be made direct to Colonel Corbett, Department of Agriculture, Pietermaritzburg.

District Reports.

HARDING, 10th June.—We have got fairly into winter now, and I am afraid it will be a severe one, as the streams have never been up above winter level, we can only hope that it will not be a long winter. Crops, taking them all round, are not good, some portions of the District felt the drought, and the locusts as well made them look very bad when I saw them last, and I am afraid they can not recover. We have had little or no horsesickness, I am pleased to say, this season. Land in this District is being much sought after by farmers from East Griqualand, for winter grazing. Several farmers from there have purchased farms in this District, and if land were obtainable others would follow suit.

P. W. SHEPSTONE, Magistrate.

INANDA, 15th June —It has been very quiet here since I wrote last. The weather has been delightfully cool—even cold on occasions. and very dry. The following are the main features of the meteorological observations during May: Rain 0·93 of an inch, which fell on 5 days, the heaviest fall being 0·48 of an inch on the 6th, Max. temperature in the shade, 95 degeees on the 29th, minimum 45 degrees on the 12th. The latter is about as low as it ever falls in Verulam, when there is usually frost along the valleys and other low-lying lands. The mean temperature for the month was 67 degrees. There was a very partial shower over the township of Verulam on the 9th inst., when ·44 of an inch of rain fell, so far as I have been able to ascertain. This did not extend far in any direction, so that the country is beginning to look very dry, and cane fields are beginning to present white patches here and there. I, however, hear from planters that they are not anxious for rain just at present, as nearly all the mills are crushing, and the density of the juice is good, and rain would have the effect of lowering it very much when unaccompanied by heat, as in summer. Stock is looking well for this season of the year, and so far as I am aware there is no disease in the Division. Horsesickness was very bad about a month ago—seemed to come with a rush with the cold weather, and kept on into the winter much later than usual. But for this the season would have been considered a favourable one. The dengue epidemic has also passed away, but very few individuals escaped it while it lasted. Considerable movements of mealies and tobacco are still taking place, and the prices of the former are being well maintained. I have heard of 8s. per muid being paid, but I think the average price has been nearer 10s. Oranges and naartjes, of good quality and sweet, are plentiful at present. Bananas do not seem to be a favourite hereabouts; one seldom sees any, and the few brought round by Indians are generally of poor quality. The Locust Act has been proclaimed in the *Government Gazette* as extended to this Division, and its working will no doubt be put to the test next summer if there are any locusts to try it upon. I have not seen any locusts about since my last notes, but I believe there are one or two swarms still hovering about the Division.

JOHN L. KNIGHT, Magistrate.

NKANDHLA, 31st May.—The fall of rain has been very small, winds have been prevalent, with an exceptionally strong north-west gale on the 12th and 13th instant, when a number of trees were blown down round the Magistracy, The first frost was noticed about the 15th instant. The natives have been busy reaping and getting in their crops, and are now selling a few mealies at the local stores, but the harvest does not appear to be very good. No locusts have been reported in the District. Horses have been dying throughout the month from horsesickness, mostly belonging to the Military. All the cattle belonging to Colonel Bottomley and his agents in the Mfongosi Valley are under license as infected with lungsickness, as well as the cattle belonging to Messrs. Havemann, surrendered Burghers. Mr. F. W. White, Stock Inspector, visited the Magistracy on the 10th and 30th instant. The health of the District has been good. There is still one case of enteric fever at the Qudeni. Things are still very unsettled in the District. The Nkandhla Rifle Association was again called out for duty on the 31st instant.

C. C. FOXON, Magistrate.

PORT SHEPSTONE, June 14th.—Since my last report, I have held my annual hut-tax collection, and had an opportunity of visiting certain parts of the District. I found that in some localities locusts had done a considerable amount of damage to the mealie crops: in some cases whole fields have been destroyed. In other places, on the other hand, and more especially at the Imbazane, splendid crops have been

reaped. Mr. Mitchell informed me that he got as much as 18 bags to the acre, and this too, from land on which no manure had been used. He stated that next year he intended using basic slag, and hoped, if all went well, to reap 25 bags to the acre. The soil about there appears to be exceptionally rich. The cattle reported by me some time since, as suspected of being infected with rinderpest, were found to have eaten some poisonous herb. On the whole horsesickness has not been severe this season. At present I know of no disease amongst stock in this Division. The rainfall for May was 1·05 inches, the highest temperature 81 degs., and the lowest 51 degs.

P. HUGO, Magistrate.

UBOMBO, 5th June.—Some bitterly cold weather was experienced during the past month The minimum temperature registered being 48½ degs., and 80 degs. the maximum The cold was intensified by south winds. Rainfall was 1·09 of an inch. The native crops, especially on the mountain, north and south of the Mkuzi River, have turned out very much better than anticipated. Larger quantities of mealies and mabele have been reaped than during the past two years, and green mealies are still being eaten everywhere. Only one calf, out of stock in the district, is known to have died, and merely from gallsickness.

A. R. R. TURNBULL, Magistrate.

Importations of Sugar Cane.

AT the ordinary meeting of the Inanda Agricultural Association, held on the 12th instant, the convenor of the Cane Plants Committee (Mr. Leonard Aeutt) reported that the Committee had visited Mr. James's estate, and inspected the samples of canes imported by the Agricultural Department, at the request of the Association. The cane from Honolulu arrived in the best condition, and there were two varieties now growing, and looking well. One box only came from Honolulu, and in this the canes were sealed at the end with paraffin candle wax, and wrapped in paper, and, as these came in so much better condition than those from other countries, the Committee recommended that in future, when canes were imported, it should be an instruction to pack them in this way. From the Barbadoes, two wardian cases were received, and only one plant showed any signs of life, and there was a small weak stool resulting from this. The canes were too young to form an opinion on, but Mr. James informed them that it was a large cane. From Queensland there were three varieties living—a cane resembling "Gold Dust," four stools; a cane resembling "Green Natal," one stool; and a cane like "Louiser," six stools. From Demerara, which was the first cane to arrive, they had seven varieties—one like "Green Natal," two stools; one a light green, five stools; which were all in "arrow" ; a very fine cane which impressed the Committee, two stools; a cane like "Bois Rouge," in appearance, with which they were unfavourably impressed, but which might prove a good variety, 10 stools; a rich dark cane, very hardy looking; two varieties resembling the "Queen" cane, but not so large, and a light-coloured cane, like the lightest of "Green Natal" ; a large cane resembling the "Queen," three stools. There was enough of cane of all varieties to complete the planting of one acre, which the Committee proposed to ask Mr. James to do when the weather was seasonable, and not to distribute any during the coming season. The wardian case was generally considered the best mode of packing, but of the three cases removed only six eyes germinated. The result of the experiment, having regard to the exceptionally dry season, must be regarded as satisfactory, and the Committee urged the Association to ask the Government to arrange for further importations from as many countries as possible. No cases were received from Louisiana, and the Committee considered it in the highest degree important that they should receive some from that country, the climate being, like our own, rather rigorous for sugar cane, and the Agricultural Department there in a state of great efficiency. The Committee pointed out that, although the result of importing cane in this manner was satisfactory, and was likely to be more so with succeeding importation, the process was rather too slow for restocking our plantations, and that, pending the establishment of our own experimental station, the em-

bargo against importation from Mauritius should be removed, and arrangements made for importing cane from that island in quantity in time for the coming planting season. If the Government Entomologist and a representative of the planting industry were sent to Mauritius, duly accredited to the Government there, they felt sure that the matter could be arranged with safety, so far as any risk of introduction of disease was concerned, and with satisfaction to the planters.

Gardening Notes.

By W. J. Bell, Florist and Seedsman.

WHERE watering can be done, further sowings may be made of carrot, turnip, lettuce, radish, beet, spinach, mustard, and cress, parsley and other herbs.

A grand lettuce for sowing now is Webb's Wonderful, one of the largest in cultivation. They should be transplanted not less than 18 or 20 inches apart, as they will easily fill up that space in good rich soil.

Two other good varieties of cabbage lettuce are the Big Boston and Iceberg.

Sow in the flower garden candytuft, larkspur, calendula, antirrhinum, phlox, drummondi, pansy, daisy, petunia, carnation, sweet alyssum, poppy, gaillardia, coreopis, and ten-weeks' stock.

The young seedling plants of carnation, pansy, daisy, and stocks that have been previously sown in boxes should, as soon as large enough, be pricked out into small beds of nice rich soil about two inches apart each way; afterwards, when strong enough, each plant can be lifted with a ball of soil and planted out where they are required for flowering. Several varieties having tap roots,such as poppy and larkspur, do not transplant well, and should be merely thinned out when the seedlings are too crowded. This thinning is a very necessary operation, especially so in regard to the poppy, the seed of which is so fine that from fifty to a hundred plants will often come up in the space that should only be occupied by one. Each plant of the larger varieties of poppy requires at least a space of eighteen inches in diameter.

Tree Seed Sowing.

The sowing of all tree seeds enumerated in last month's notes should be completed this month, and also the various varieties of eucalypti, such as E.Globulus, Blue Gum,, E. Amygdalina, and E. Rostrata, both red gums; E. Coriacea, Weeping Gum, E. Marginata, the Jarra, E. Obliqua, Stringybark, E. Paniculata, Iron Bark, E. Robusta, Swamp Mahogany, E. Viminalis, Manna Gum, E. Diversicolor, Karri Tree, E. Citriodora, Lemon-scented Gum.

Pruning.

The pruning of grape vines and all kinds of deciduous trees and shrubs may be commenced at the end of this month, and should be completed by the end of July.

Grape vines should be pruned by cutting back last year's wood to one or two eyes. If the vine is in an exposed place it is best to leave two eyes. The Isabella or Catawba may be pruned to one eye only. The pruning of deciduous flowering shrubs requires considerable discretion, as some need different treatment to others ; take, for example, the double-flowering May Spirea Reevesi. The beauty of this shrub when in bloom is in its long pendulous sprays of white blossom, and the only pruning required is in cutting or thinning out as near the ground as possible all the old wood, and leaving the long sprays required for flowering untouched. As an example of a different style of pruning, the Pride of

India may be given. The flowers on this shrub are produced on the young wood of the same season's growth, and in the winter pruning all the wood of the last season's growth may be cut back to the old stems. The pruning of evergreen shrubs consists chiefly in thinning and cutting out all the old wood.

Rinderpest Proclamation.

THE following Proclamation by His Excellency the Governor (Sir Henry E. McCallum), dated 18th June, 1901, was published in the *Government Gazette* on the 18th inst. :—

Whereas the disease of Rinderpest has broken out in the area hereinafter defined :

Now, therefore, in virtue of the powers vested in me by the Law No. 13 of 1866, and the Animals Diseases Act of 1894, I, the Governor in Council, do hereby proclaim and make known that the place defined in the Schedule to this Proclamation shall be deemed to be an infected area within the meaning of the said Law and Act.

And, I do hereby forbid the removal from or bringing into the said area of any horned cattle, sheep, or goats, whether the same are or are not affected with any disease; but such prohibition shall not apply to horned cattle, sheep, or goats carried through the said area by the Natal Government Railways, provided that such animals are not entrained within the said area.

The penalty for any contravention of the Law No. 13 of 1866, or of the said Animals Diseases Act of 1894, or of this proclamation, or of any other proclamation, which may hereafter be issued under the authority of the said Law or Act, shall be a fine not exceeding £50 sterling, with the alternative of imprisonment, with or without hard labour, until the payment of such fine ; such imprisonment not to exceed the term of three months.

This proclamation shall take effect from the date of promulgation in the *Natal Government Gazette.*

SCHEDULE.

Boundaries of infected area :—

On the west by the Greytown Road ;

On the north by the Hermansburg Road ;

On the east by a line five miles east of Umvoti River and of its tributary (unnamed), running north to cross the Hermansburg Road ; and

On the south by the Inkanzi and Rooi Spruits connecting the Greytown Road south of Sevenoaks with the Umvoti River.

Correspondence.

To the Editor Agricultural Journal.

EXPORT OF ORANGES AND NAARTJES.

SIR,—It may prove of use if I give you an instance of the above fruit being successfully sent to England from my brother's place, "The Kloof," on the Town Hill.

On or about 13th July last a quantity of oranges and naartjes were picked and packed in two old paraffin cases, the sides and tops of which, however, were not left solid, but had been taken off, and part put on again in the shape of bars, the ends and bottoms remaining untouched, and a division being put in the middle. Each orange and naartje was wrapped in a piece of newspaper, and the fruit was ripe when picked, being yellow but quite firm, and of course it was picked by hand to avoid bruising. The newspaper constituted the only packing.

The boxes were sent to the *Saxon* at Durban, and I presume placed in the "cool chamber," or whatever the cold storage of the steamer be called. They duly arrived at Southampton, and were despatched at once, and the one for me arrived at Lowestoft, where I was then staying, on the 13th August. The condition of the fruit was absolutely perfect,

being quite firm, and the appearance all one could wish; in fact it looked as if it might have been picked within twenty-four hours. There was but one exception, which we came across about half way down the box, an orange with a large bad place between the side and the top, and I have no doubt it had been dropped on the ground in course of packing, and instead of being rejected in consequence, had been picked up again and packed with the fatal bruise which caused it to go bad.

Some of the oranges were kept just a month, the last being eaten on 13th September, and found quite fresh and delicious inside, though the skin was somewhat wrinkled by that time. The naartjes began to get a little soft before the oranges did, and would not as a rule keep so long, I believe.

Now, if oranges and naartjes in such condition as were these could be landed in England during July and August, not only would they arrive when the weather was at its hottest, and such fruit most desired by consumers, but it would fill a gap in the Home fruit supply, coming in as it would do between the strawberries and pears. The demand in London and at all seaside places would be simply unlimited, and I feel sure that excellent prices could be obtained for any quantity.

I do not know of any other place so well situated as Natal for supplying the Home markets with these fruits at just the right time to ensure a large and ready sale. We should commence shipping the beginning of June, and continue till the end of July, but not later than that, I think.

Careful picking by hand is easy enough, and it will be observed that the packing is quite simple, so that the only other requisite to ensure success is cool storage on the voyage Home at a moderate cost.—Yours faithfully,

F. A. HATHORN.

Maritzburg, 7th June, 1901.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of May, 1901 :—

Name of Colliery.	Labour Employed. Above Ground. E.	N.	I.	Below Ground. E.	N.	I.	Coal raised. tons.	cwt.
Natal Navigation	*13	50	117	9	340	97	11,573	5
Dundee	12	28	125	11	186	274	8,914	9
Natal Marine	10	130	17	7	375	3	8,690	4
Elands Laagte	11	17	120	9	120	230	8,022	12
St. George's	12	114	14	7	186	0	5,430	0
Natal Steam Coal	7	67	15	3	194	5	2,925	0
Newcastle	4	9	12	4	109	0	1,270	0
New Campbell	6	81	18	6	139	22	730	0
Inkunzi	2	12	0	1	48	0	677	19
West Lennoxton	1	6	4	1	0	27	507	0
Crown	No Return.							
Total	78	514	442	58	1,697	658	48,740	9
Corresponding month (1900)	18	34	95	7	150	210	7,015	12

*6 Europeans, 15 Natives, and 25 Indians, reported as employed on new construction, shaft sinking, and other unproductive work, are not included in the return.

CHAS. J. GRAY,
Commissioner of Mines.

Mines Office,
June 6th, 1901.

Return of Coal bunkered and exported at the Port of Durban for the month of May, 1901 :—

	tons.	cwt.	tons.	cwt.
*Coal Bunkered			22,430	17
Coal exported to Cape Colony	3,896	9		
Beira	153	14		
Chinde	29	14	4,079	17
Total bunkered and exported			26,510	14

*Included in this item are 4,079 tons 17 cwt. of Imported Coal.

GEO. MAYSTON,
Collector of Customs.

Customs House, Port Natal,
June 5th 1901.

Dairying in Australia.

THE HON. F. R. MOOR'S IMPRESSIONS.

(*Continued.*)

SILOS AND ENSILAGE.

THE following is a further instalment of the pamphlet :—

On this subject we have taken numerous extracts from a pamphlet on silos, by J. L. Thompson, late Principal of Dookie College.

The silo system cannot be said to be of recent origin, for we read of the ancient Romans preserving fruits, grains, and forage is a green state in large subterranean vaults. The Mexicans also have practised the same process for centuries, and still preserve a large bulk of their fodder in this way.

The attention of the English-speaking world was first drawn to this subject by the translation by a Mr. Brown, an American, of a work written by a Mr. Augustus Goffart, a distinguished member of the Central Agricultural Society of France. This work was published in New York in 1879, when the subject was quickly taken up by the American people, who have since done so much to popularise the system, and there are now in that country thousands of silos.

In 1882 a conference was held at New York of several hundred farmers, who met to compare their various experiences, and the answers to some of the questions considered are very remarkable. Regarding the profitableness of ensilage :—

Farmer No. 6 said : "It will double the stock-carrying capacity of our farm ; its advantages to dairymen are incalculable."

No. 7 said : "It gives a vigour and healthy appearance not seen in hay-fed cattle. We can double the stock, and thus increase the fertility and value of farms."

No. 8 : "It enables one with a little land to keep a large amount of stock."

No. 9 : "We believe stock can be kept for one-half the cost of other food, and will fatten as much as during the best grass season."

No. 10 : "Anything of vegetable nature that animals will eat will make useful ensilage."

No. 11 : "40 or 50 tons of fodder can be ensilaged off one acre, which is worth more than 20 tons of hay."

No. 19 : "The cost of feeding on ensilage as against hay and roots is one to three."

No. 20 : "I think cattle can be kept for one-fourth the expense of any other method."

No. 28 : "One acre of ensilage will keep eight head of cattle 100 days."

No. 30 : "I am keeping four times the number of stock with my silos that I have been able to do hitherto. A silo filled with green fodder in time of protracted drougth is invaluable."

No. 37 : "The profits are very large. I consider my two silos worth £2,000, and would rather pay interest on that amount than give them up."

No. 38 : "Ensilage I believe to be the dairyman's anchor on the expensive land of the East. I would as soon think of doing without my house as without a silo. I farm for profits, not for pleasure, and have found the silo the best investment I ever made."

It is needless to multiply these extracts. They are from practical men, whose opinions can be relied upon, and if ensilage is so valuable in America it must be doubly so in these Colonies, subject as they are to long periods of drought. It is really astounding that so little has been done to popularize the silos in Victoria. Some years ago the subject was taken up by the Royal Com-

mission on Vegetable Products, and much valuable information was distributed.

Before giving some details concerning the introduction of the silo into these Colonies, it may be mentioned that there are now a very great many in England, Scotland, and Ireland, and hundreds of new ones are being built every year. The Messrs. Trepplin, near Kenilworth, Warwickshire, preserve over 5,000 tons every year, and at the Smithfield Club Cattle Show, Islington, 1884, there were 254 exhibits entered for competition, comprising almost every description of plant that could be placed in a silo.

Australian Silos.

To Mr. Charles Rake, of Olive Farm, Enfield, South Australia, is the credit of introducing the silo into these Colonies. Mr. Rake has for a long time been in the habit of taking in all the best agricultural papers in the world, and, observing the apparent success of the silo in America, was not slow to imitate the example. As early as 1880 Mr. Rake built his first silo, and the whole neighbourhood thought he was doomed to disappointment when they saw him putting in tons of succulent green fodder into a pit. Mr. Rake invited his neighbours to come and see the opening of the silo six months afterwards, and, to the surprice of all, found the fodder coming out in excellent condition. Mr. Rake the following year increased his silo capacity to six in number. By this means he was able to produce first-class cream and butter all the year round.

Mr. J. L. Thompson, who was managing "Beefacres," the adjoining estate, at that time, on seeing the success of Mr. Rake's silos, was induced to imitate his example, and in 1884 he built a silo of concrete, which for strength, durability, and convenience, will compare favourably with any silo in the world. This silo consists of four compartments, each 20 feet long, 12 feet wide, and 15 feet deep, having a total capacity of 14,000 cubic feet, and capable of holding 300 tons of green fodder. The cost was about £300, and the structure will last sixty years, bar accident. A sample of ensilage from the first filling of this silo obtained a prize of £10 10s., presented by the proprietors of the "Australasian" at the National Show, Melbourne, 1885.

When carrying on dairying at the well-known Spring Bank dairy farm near Egerton, Mr. Wilson used to incur heavy losses every summer, owing to the sudden shrinkage in the quantity of milk when the grass dried up. Ensilage being recommended as a summer fodder, he had a silo constructed and filled with chaffed green oats, peas, and maize. The oats and peas were cut and put into the silo in the month of November, and from the same land a crop of maize was ready for the silo by the following April or May. Thus two crops a year were had from the same land, giving an average yield, in the green state, of about 20 tons per acre. The ensilage always turned out well, and lessened the dread of dry summers, scarcity of summer feed, and shortage of milk.

Further practical proof of the value of ensilage for milk-producing purposes, when other feed was scarce, was given at the grounds attached to Government House, Melbourne. Shortly after the arrival in Victoria of Lord Hopetoun, Mr. Wilson, by desire, superintended the cultivation of 3½ acres of poor land at Government House for the growth of two crops a year on it for conversion into ensilage for feed for the Governor's cows during the summer months. This also was a great success, for by applying 30 loads of stable manure per acre to the land a crop of twelve tons per acre of oats and vetches was obtained, followed in the autumn by a twelve-ton crop of maize. This fodder, grown on 3½ acres of land, kept twelve cows in splendid condition right through the whole of the dry weather each summer. The milk and cream produced by the cows fed on the ensilage were pronounced by Lord Hopetoun to be equally as good as when the cows were fed on the spring pastures. These facts have been repeated to farmers in almost every part of Victoria, yet, strange to say, not one in a thousand has yet adopted the system.

Construction of a Silo.

Local circumstances must determine what material can be most economically used for the construction of a silo. Where plenty of gravel and sharp river sand can be procured nothing in our opinion can equal concrete walls. The division walls should be 2 feet thick, but 18 inches will be sufficient for the outside walls, as these will be built against the excavated bank. One-third of the silo should be above ground and two-thirds below. Doorways as far down as the natural surface should be provided, so as to facilitate the filling of the silo and also the getting out of the ensilage. These openings can be closed up with planks as the silo is being filled, and removed as the ensilage is being taken out. The walls of the silo should be as smooth and plumb as possible, so as to allow the ensilage and covering planks to go down easily as the mass subsides. The walls and bottom of a silo should be air and water-tight. It was thought and recommended at one time to provide drainage at the bottom of the silo, but this is a fallacy, as no moisture should escape from the silo; and a drain that would carry off water would also allow air to get in, which would do a great amount of damage to the ensilage. It has been said that it makes no difference whether a silo cost £20 or £500, one will preserve ensilage as well as the other, the only thing required is continuous pressure. But you cannot make small silos as effective as large ones, nor can you pack the fodder so well against rough surfaces as against walls that are smooth, consequently there is more waste of fodder with small pits and rough surfaces than with large silos and smooth walls.

Cheap earthen silos (holes simply dug in the ground) are more likely to popularize the system of ensilage among the farming community than expensive masonry, and where the earth is sound this plan may be adopted with perfect success.

Filling the Silos.

Before saying anything on this head, it will be as well to state that there are now two recognised varieties if ensilage, viz., sweet and sour ensilage. By the term "sour" it must not be understood that the ensilage is in any way offensive; it has a pale greenish yellow colour, and a slightly vinous odour. Sweet ensilage, on the other hand, is of a brown colour, and of a sweet luscious odour. Sour ensilage has been found to be most suitable for animals producing milk, and sweet ensilage for fattening stock. When it is desired to produce sour ensilage, the scrop may be cut when full grown (but before any of the moisture has escaped), and carted to the silo immediately it is cut, and pressed tightly down. The sooner the silo is filled and the weights applied the better for sour ensilage. If the crops are of a rough nature, such as barley, vetches, maize, &c., they should be pressed through the chaff-cutter, but the finer English grass does not require chaffing. When filled rapidly and immediately weighted, the temperature will seldom exceed 80 deg. Fahr., and little or no fermentation will take place.

Sweet Ensilage.

When it is intended to produce sweet ensilage the crop may also be cut when full grown; but it must lie a day or two in the field, so that, at the time of being put away in the silo, it contains less than 70 per cent. of moisture. The process of filling should go on slowly, so that the temperature may rise from between 125 to 150 deg. Fahr. Should the temperature not be sufficient either the fodder has been too wet, or the filling and consequent compression has been going on rapidly. When a sufficiently high temperature has been obtained, it should immediately be cooled down to below 90 deg. by applying the pressure, or the ensilage will rapidly spoil. The testing the temperature of the silo is a very simple matter. Procure a 12-feet length of common inch gas pipe, to this weld a steel point, drive this into the ensilage mass about the centre, and by means of a small glass thermometer and a piece of string you can test the temperature at various depths. I should mention that it is well to put a little wool in the bot-

tom of the pipe to save the glass thermometer in its descent.

Covering and Closing the Silo.

The filling of the silo should be carried out in such a manner that the layer of fodder should always be horizontal. The filling having been completed, the covering up takes place. The planks should be put across the short way of the silo, and 9 x 2 red gum is found to be a convenient size. At one time it was thought to be necessary to have the covering as close and air-tight as possible, but this has proved to be a fallacy. Sawdust, bran, felt, boards tongued and grooved, have all been tried in order to prevent the air from escaping ; but the object now is to facilitate the air to escape by compression, and for this purpose it is better to put the planks about a quarter of an inch apart, and half-an-inch shorter at each end than the silo, so that there will be no fear of them sticking against the walls.

Weighting the Silo.

Mr. Wilson's first experience in weighting the silo was with bags of sand two feet deep ; but this was not a success, as the bags soon got rotted. He then got the local blacksmith at Egerton, Mr. Simpson, to make a screw and chain press. The screw is worked by one man, and the total leverage of the appliance is as 450 is to 1, due allowance being made for friction. This appliance is a great saving of labour, especially when a silo is being refilled, as the whole covering can be removed in fifteen minutes. In the absence of any mechanical pressure, the weighting can be accomplished by the material easiest procurable on the ground, and that will give sufficient pressure, viz., 100 to 150 lbs. to the square foot. Ensilage can be made in a silo without pressure ; but, taking into account the waste of space and loss of ensilage by decay at the top and sides, this system has no advantage to recommend it. As good ensilage has been preserved in this way as in the most expensive silo, and a small farmer need not hesitate to sink a hole in any good ground, put in his green fodder, and cover it up with two feet of earth, and it will come out green and sweet six or nine months afterwards. Wooden portable silos are now much used in England. They are in shape like a huge barrel, and answer the purpose very well in that country. but I doubt very much whether they would be successful in these Colonies, owing to the excessive heat of our summers. A great deal has been done in England in the way of converting old barns and other buildings into silos.

Opening the Silo.

Only a sufficient number of planks should be removed as to give convenient room for the operation of cutting to be performed.

It is best to cut ensilage in vertical sections as is done in a haystack, as much being taken out each day as is required for the day's consumption, although it will keep fairly well for a week or so after being removed from the silo. The weights should not be removed from the uncut portions until absolutely required, as it is necessary to continue the pressure as long as possible. When the first cut gets below the surface use a large coal basket capable of holding 100 lbs. This is raised by means of block and tackle sufficiently high for the man in the dray to catch and empty it. When the silo is small and deep and the consumption rapid, the whole of the weights and coverings may be removed at once, and the ensilage removed from the entire surface as required. In a broad and shallow silo, however, it would be unwise to attempt this method. Ensilage has been taken from a silo of this kind every day except Sunday for three months, and the last was as good as the first.

Crops for the Silo.

Any vegetation that stock will eat in its natural state will make good ensilage, and it will be much improved by the operation, especially if fed to cattle. It is said that cattle assimilate ensilage better than they do any other food, and the reason for this is the change effected in the silo is nearly or quite that which is brought about in the first stomach of

the ruminant animal. Barley and tares sown immediately after the first rains are very suitable and profitable for a first filling. These will be ready to put away in the silo, say, about the 1st of October, and the land can be at once ploughed and sown with maize, which will be fit for pitting about the end of February. As much as 30 tons per acre of fodder has been obtained in this way without irrigation, i.e., from the two crops. This is sufficient per acre to keep a milch cow for twelve months. Indeed, it has often been proved that by thoroughly cultivating and manuring the land ample food can be grown on an acre for a cow by adopting the ensilage system. Cockspurs variegated, and Scotch thistles, if put away in succulent condition, can be taken out six months later in prime condition, and stock will devour them ravenously. In short, the silo has been styled "the farmer's all"; nothing can come amiss to it. Mangold or turnip tops, cabbage leaves, surplus fodder of any kind can be siloed and kept till periods of want.

We have heard of stock-holders in the interior losing in times of drought all their valuable stud bulls, rams, &c., for want of food. There is really no excuse for this state of affairs. Every few years we have seasons of plenty, when thousands of acres of the natural grasses can be mown and siloed for use in the years of famine. Mr. Walter Lamb, of Rooty Hill and Merilong, Liverpool Plains, New South Wales, has proved to his fellow pastoralists what can be done by means of the silo in storing up fodder in good seasons to save his stock from starvation in periods of drought. Mr. Lamb has siloed over 10,000 tons of the native grasses on his estate at Merilong, and is able to keep a full-grown bullock for twelve months in good condition at a cost of 8s. 9d., and a sheep for 1s. 9d. No man has done so much as Mr. Lamb to demonstrate the great boon that may accrue to the pastoralist in these Colonies from the use of the silo. His silos were inexpensive, but answer the purpose well. The weighting is done entirely with earth, and he uses no top covering between the ensilage and the earth.

The Chemistry of the Silo.

It is not intended to touch on the scientific aspect of the silo, but this paper would be incomplete without mentioning that eminent scientists have, as a rule, all through thrown cold water on the subject of ensilage. Professor Custance, of the Roseworthy Agricultural College, South Australia, compared the putting of green fodder in a silo to burying a dead dog. Sir John Lawes and Dr. Volcker have often given the English farmers gentle warnings that ensilage was not worthy of their attention. Lately, however, Sir John has conducted a number of valuable experiments as to the feeding value of ensilage, and has proved that 50 lbs. of ensilage was equal to 84 lbs. of good mangolds.

Mr. A. N. Pearson, our Government Agricultural Chemist, published the result of an analysis of some ensilage submitted to him, and states that 2 lbs. of it are equal to 3 lbs. of good hay. This shows ensilage to be of great value indeed, and scientific men are now forced to admit there is something in ensilage after all, and certainly progressive farmers of the present day cannot ignore it.

Stack Ensilage.

Ensilage has been preserved in good condition in England by simply stacking it green without any silo at all. Mr. H. B. Hughes, of Booyoolie Station, South Australia, stacked a large paddock of lucerne right from his mowing machine. Some time after his stack was built, when his lucerne was 6 inches high, Mr. Hughes put a number of bullocks on to the lucerne, but getting a taste of the stack ensilage they preferred it to the succulent green feed. This shows that there is something in the system that improves the fodder, as the tastes of cattle are the best tests of its quality. Mr. Hughes now provides large quantities of ensilage to top up his Queensland bullocks before putting them on the market.

The only objection to stack ensilage is that our penetrating hot winds and sun

have the effect of spoiling a considerable portion of the fodder around the edges of the stack, and, although the ensilage can be made well in a stack, the loss is sometimes so great that it will repay the farmer to make a silo.

Practical Results from the use of Ensilage.

Wonderful results have been reported as to the value of ensilage on dairy and other stock, but as some of these may be looked upon as "American tall talk," the actual experiences may be given of Mr. J. L. Thompson, formerly Principal of the Dookie Agricultural College. Mr. Thompson writes as follows :—

"When I opened the silos at Beefacres in 1884, about the end of January, our dairy cows were not averaging two gallons of milk a day, and it was almost a matter of impossibility to make any good butter, although we had a very good dairy. A week after we commenced using ensilage the milk increased to two and three quarter gallons daily, and the butter made from this milk had the peculiar yellow tint so well known as characteristic of good butter. Considering the time of the year it was also remarkably firm, and the churning was accomplished in half the usual time. In March of that year we had a clearing sale of 127 Clydesdales and 110 shorthorn cattle. They were fed almost exclusively on ensilage for three months before the sale, and it was remarked by all good judges that they never saw stock looking better or healthier. I can further assert that during the whole of the time this large and valuable number of stock were fed on ensilage there was not one single case of sickness the whole time."

Great excitement was caused in South Australia some years ago when nine horses out of 30 being fed on ensilage died suddenly. Of course, everyone said it was the ensilage ; and so it was, but it was largely composed of several very poisonous plants, which, if eaten in any condition, would have caused death, and, being chopped up, the stock could not avoid eating them, although in the pasture they could be passed by. No evil results from the use of good fodder made into ensilage has ever come under our notice, but, on the contrary, all stock fed on it have shown a most robust and healthy appearance.

"Ensilage in a nutshell," is simply this :—Every farmer in the spring of the year has abundance of green succulent food for all stock. Then is the period of the year when stock will put on condition, and when any quantity of prime butter can be made. By the use of the silo this abundance of succulent food can be carried right through the year. In the parched month of March, when not a green blade of vegetation can be seen in our fields, you can open your silo full of fresh green fodder, and feed it to your cows, which will give milk that will produce butter quite as good as any you are making at the present time, on what is known as the flower of the grass. This proves, beyond a doubt, that it is not so much the heat of our summers that causes the production of that white frothy-looking butter, so often seen during summer, as the unsuitable nature of the food that cows under ordinary circumstances have to eat.

In England the use of silos and ensilage has passed the experimental stage. Two very important reports bearing on ensilage have been issued, a few extracts from which are taken. These are the reports of the Ensilage Commission, and the Judges of the Royal Agricultural Society's Competition. They are dated May, 1886. Be it noted, the evidence is not that of enthusiastic advocates, but the calm deliberations of judicial bodies appointed to consider and determine as to the value or otherwise of the system. Both bodies emphatically declare ensilage a decided success, and both reports are capable of affording encouragement to British farmers. The Ensilage Commission classify the advantages claimed for ensilage under the following heads :—

1. In rendering the farmer independent of the weather in saving his crops.

2. In increasing the productive capabilities of farms.

3. In greater weight of forage saved.

4. In greater available variety and rotation of crops.

5. Increased facility for storing crops. It is suitable for all kinds of stock — dairy stock, breeding stock, store stock, fattening stock, and farm horses.

The Commissioners, in conclusion, state that they have endeavoured to discount all exaggerated estimates, as well as to make allowance for a considerable amount of prejudice and incredulity which they met with, and they add :— "After summing up the mass of evidence which has reached us we can without hesitation affirm that it has been abundantly and conclusively proved to our satisfaction that the system of preserving green fodder crops promises great advantages to the practical farmer, and, if carried out with a reasonable amount of care and efficiency, should not only provide him with the means of insuring himself to a great extent against unfavourable seasons, and of materially improving the quantity and quality of his dairy produce, but should also enable him to increase appreciably the number of live stock that can be profitably kept upon any given acreage, whether of pasture or arable land, and proportionately the amount of manure available to fertilize it."

The report of the Royal Society's Judges is also very interesting and instructive, and is equally favourable to the system under investigation.

The following concise summary of the experience of the judges of the northern division is worthy of production :—

"We are of opinion that the great question of satisfactorily ensiling green crops has received ample confirmation. It has been proved to us incontestably that its success has been manifested in every district. We have seen silos of brick, of stone, and of wood ; we have seen old barns and other buildings converted into silos ; we have seen them containing 20 tons, and we have inspected others capable of holding 700 tons ; we have found silos constructed at a little over £20, and others at £400; we have found them filled with all sorts of green crops, and we have found some sour and some sweet, the latter in by far the greater proportion ; we have seen them weighted with bricks, with stones, with slates, with sand, with earth, and also with ingenious mechanical contrivances ; we have inspected some chaffed, and in others the fodder spread out and put in whole ; in all cases the practice was successful, and in every instance cattle of all descriptions did well on the silage, and in many instances the opinion was conclusive that decidedly more stock could be carried per acre with silage than with hay. In conclusion, we would say that we consider the system of ensiling will probably affect the future of agriculture on strong land, as in most instances, especially in such where it is necessary to obtain winter foods for the stock, a crop of winter-grown tares or trifolium, or other strong-growing green crops may be sown in the autumn at little expense, and mown and put in the receptacle by the first week in June, and thus do away with the immense expense and great uncertainty of the cultivation and consumption of roots on such land. The report winds up with the following verdict :—The chief advantage of silage-making against haymaking is its comparative independence of the weather, that the fodder is handled while green without any risk of the tender and nutritious leaves being lost on the ground as in haymaking, that the resulting silage is succulent and palatable, and that on purely grazing farms it is now possible to obtain a portion of the grass crop for winter in such a state as to equal the effect of summer-fed grass for the purposes of the dairy."

In conclusion, it may be added that we cannot continue to keep farms in a high state of fertility without stock, and we cannot keep dairy cattle profitably unless we provide feed for them during periods of drought and consequent famine, and the silo will greatly assist us in this direction.

[The End].

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of May, 1901.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1900.	Total for same per'd from July 1st, 1899.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	77·4	56 7	90·0	48 1	2·13	9	0·66	19th	42 87	24·86
Stanger...	77·8	56·6	94·0	48·0	2·50	11	0·97	17th	36 98	21·38
Verulam	79·5	48 1	95·0	44·0	0·93	5	0 48	6th	38·58	23 77
Newcastle	67·0	39·8	76 0	32·0	...	...	...	...	28 21	...
Estcourt	73·0	36·4	81·0	27 0	0 10	1	0·10	28th	29·60	25 30
Port Shepstone .	72·0	61·2	81·0	51·0	1·05	6	0·60	18th	38·95	37·72
Umzinto	77·8	55·4	80·0	51·0	0 27	5	0 10	19th	33·81	28·92
Richmond	73·2	45·0	86·0	36·0	0·23	1	0·23	17th	31 50	33 26
Maritzburg	76 3	44 4	90·0	35·0	0 15	1	0 15	17th	32 42	28 31
Howick	72 4	39·0	84·0	28·0	0·07	1	0·07	18th	24 63	26 61
Dundee	71·3	37·2	85·0	31·0	...	...	..	...	...	...
Weenen	77 1	37·0	86·0	27 0	0·04	2	0·04	28th	27·44	20·08
New Hanover ...	73·6	43·3	88·0	32 0	0·36	4	0 30	17th	34·51	28·64
Hillcrest	71 7	53·0	85·0	46·0	0.78	8	0·35	7th	35·99	...
Mapumulo	71·2	49.2	87·0	41·0	0.18	3	0 12	18th	34·85	29·22
Nongoma	70·9	54·2	82·0	46·0	0·77	2	0·42	21st	43·34	26·18
Qudeni	62 2	40·2	73 0	31 0	1 00	11	0·41	6th	...	...
Hlabisa	72 2	58·9	80·0	45 0	1·45	4	1·00	7th	...	22 10
Melmoth	78 0	51·0	91·0	43·0	1·48	6	0·69	7th	31·75	...
Ubombo	...	...	...	...	1·09	4	0·75	7th	32 64	24·03
Eshowe...	74·4	54 5	89·0	46·0	1·95	7	0 93	7th	49·04	...
Point	...		...	...	1·93	8	0·90	18th	34·71	24 89
South Coast Junction	...	...	. .	...	1·03	9	0 63	19th	...	...

OTHER STATIONS.

Estcourt	...	...	74	22	0 06	1	0·06	28 h	30·87	26·73
Nottingham Road ...	...	...	...	...	0 17	3	0·09	18th	...	37·28
Adamshurst	...	...	77	41	0 16	1	0·16	18th	27·10	37·00
Hilton	...	...	83	36	0·12	2	0·09	17th	32·49	36·06
P.M.B. Tn. Bush Valley	...	...	...	...	...	...	...	...	...	51·09
Ixopo	...	...	78	44	0 07	2	0 06	5th	13 24	21·10
Mid Illovo	...	...	77	43	0·61	3	0·45	18th	37·06	27·43
Ottawa	...	...	...	...	1·07	6	0·32	19th	39 87	...
Mount Edgecombe ...	...		92	50	1·14	7	0·51	7th	45·32	19·72
Cornubia	...	...	...	...	1·22	...	...	...	50·47	25 17
Milkwood Kraal ...	...	...	...	...	0·98	...	..	.	32·16	20·69
Blackburn	...	...	...	...	1·35	...	...	...	39·30	24·63
Saccharine	...	...	...	...	1·08	...	...	...	34·77	30·04
Prospect Hall... ...	...	...	...	..	2·19	...	...	...	47·07	..
Clairmont	...	...	...	...	1·58	4	0·59	18th	46·69	...
Equeefa	...	...	85	54	0·38	6	0·15	7th	37·81	26 62

A Barn.

THE above illustration represents a large and commodious barn at Ward Hill, Mr. John Marwick's farm. The framework of the roof is constructed entirely from sawn gum wood.

Green Manuring.

By Alex Pardy, F.C.S., Agricultural Chemist.

MUCH has been said and written of late years on the subject of growing crops for manurial purposes, and scientific investigations are responsible for the great advancement made in methods of improvement, both of the physical and chemical qualities of the soil, in their relation to plant life. One of the most important investigations has gone to prove the fallacy of bare fallow, or 'resting the land,' as it is called. It has been demonstrated that the land is capable of producing crops continuously, provided it is well-cultivated and receives a proper rotation of crops, and supplied with the constituents which are liable to become exhausted. The soil might properly be regarded as the medium in which plants receive their support, and is most adapted for the development of their organizations. Throughout the soil the mineral constituents, which naturally are found there, are so distributed that the plant roots develop in their search of the material that will aid their development, and thus they become established or anchored in the most suitable environment which will promote their growth and fulfil all the conditions of their nature.

The seed of the future plant contains in itself sufficient stored-up nutriment to give it a start in life. It sends forth its roots, young leaves and stem, and in the process exhausts its store of food. Thence it becomes dependent on the material which its roots are fitted to extract from the soil in which it has sprung, and with the unfolding of the leaves the whole organisation comes into play, making it capable of drawing carbon and oxygen from the air and elaborating the various materials it has accumulated into food,

from which the growing parts receive their supply and power of further development.

Grown on pure sand the development of the plant would cease after the exhaustion of the seed food supply, as there are no necessary mineral constituents present from which it can draw, but if these constituents were added to the sand the plant would continue to live and develop. And so it is with the soil, provided it is properly cultivated and well supplied with all the constituents necessary for the well being of the plants, it will go on carrying crops year after year, a natural medium through which we can feed and rear our crops under the conditions which by nature are most adapted to them.

The question of supplying the plant with food material in the cheapest and most approved form, is a living one at the present day. The more cheaply and efficiently we can manure, the more satisfactory will be the returns, and in casting around for cheap sources the one of green manure presents itself as an inexpensive way of furnishing the valuable nitrogenous constituent in an inexpensive manner. The subject of artificial manure has already received a little attention from me in the *Journal*, but that of green manuring was delegated for future consideration, as I considered it too important to be discussed under the short notices that I wrote on artificials.

It will be as well, in the first place, to consider some of the objects and effects of soiling crops. If a crop of some description were grown and ploughed under, nothing would be added to the soil in the shape of minerals ; carbon and oxygen would certainly be increased by absorption through the crop from the atmosphere, but the mineral constituents such as phosphoric acid, potash, and lime, already derived from the soil, would simply be returned to it, in no way increased. Nor has the nitrogen (with the exception in one order of plants) become more abundant ; and the natural question arises "where does the benefit of green manuring appear ?

A great change has been effected by the green crop, it has sent its roots horizontally and vertically, far and wide, in search of food, it has been at work dissolving out mineral matter, building up its system and storing food, accumulating much valuable material during its growth, which in the process of decay is readily yielded up in a much more valuable and accessible form to those plants which succeed it. The various constituents drawn together enrich the soil, not in an increased quantity of these constituents, but in their concentration and ready availability. Besides which the land is enriched by the addition of their humus of vegetable matter which, as is well known, has a powerful influence on the conservation of moisture, giving body, especially to sandy soils, and keeping the land friable and in good heart. The effects of the added vegetable matter are far reaching ; while decaying it assists in the liberation of fertilizing constituents, regulates the soil temperature, it is the home of useful bacteria, and, in fact, must be looked on as a necessary ingredient in our soils.

There are, broadly speaking, two classes of green manures, viz. :—Leguminous and others. The former order of plants includes the clovers, peas, beans, vetches, lupins, lucerne, etc., and is the most important class for soiling purposes. The latter includes all other plants, but precedence is given to those which are fast growing, easily and inexpensively cultivated. They are mainly grown for the reasons mentioned, *i.e.*, rapidity of growth, collection of mineral matter, and the supply of humus material which they give.

The legumes are, however, the class essentially adapted for this purpose, as they not only fulfil all the functions of the other, but enrich the land in nitrogen, the most expensive ingredient which has to be supplied in artificials. This unique property is due to the bacteria which live in the root nodules ; they have the faculty of drawing on the inert nitrogen of the atmosphere, and passing it on in an assimilable form to the plants on which they live. Only this order of plants have been observed to be attended by these nitrogen-absorbing bacteria, and to them the plant is indebted for its main supply of nitrogen, so that when the plants mature and are ploughed in, they increase

the contents of the soil by the amount of the nitrogen they have been able to take up from the atmosphere.

It has been estimated that such crops supply from 50 to 150 lbs. of nitrogen per acre, about equal to the amount of nitrogen contained in from 2½ to 8 cwt. of nitrate of soda, or 2 to 6 cwt. of sulphate of ammonia.

There are so many varieties of leguminous plants, both susceptible and hardy, that they can be selected to suit almost any climate, hot, temperate, or cold. For the purposes of manuring they are usully sown in midsummer or autumn, so that they may receive sufficient heat and moisture to enable them to attain sufficient growth to permit of their being turned in at the end of the year, or in the early spring. The exact time of planting is regulated by the system of cultivation, previous crops, and individual circumstances. When grown late in the year, at a time when the ground would otherwise be bare or the standing crop inactive, they fill the land at a time when the nitrifying bacteria are most active, and when a great part of the nitrates they form are liable to be lost by leaching. In the presence of active root growth the nitrates are taken up by the plant as they are prepared, and the loss in this direction is greatly minimised.

It may be necessary to manure the green crop, which on the face of it looks like robbing Peter to pay Paul, but it is not so; the manure so applied not only increases the yield of the soiling crop, but it is still available for the standard crop, both through the medium of the vines ploughed under, and the remainder which has not been utilised. Besides, the improvement effected on the more insoluble parts by the availability brought about during the process of decay by its chemical action, makes much of the insoluble matter fit for use by the new crop.

The most beneficial manures to apply to the leguminous crops are phosphoric acid, potash and lime, and in some cases it will prove of great benefit to assist them to a vigorous growth by the addition of a little soluble nitrogen.

Certain precautions have to be observed when green crops are grown simply for manurial purposes. It is always advisable to see that sufficient dressings of lime are given, both for the benefit of the crop itself and to neutralise the excess of acid which may occur during the decay of so much rank vegetable matter. The lime will tend, to a large extent, to counteract any evil effects arising from this cause, and will promote a healthy condition for the nitrifying organisms. Good and thorough cultivation will also assist by æration of the soil, and exposure to the influences of the atmosphere, and by the inclusion of oxygen in the interstices among the soil particles. In warm, moist climates it is inadvisable to turn in such a large amount of green moist herbage, decay is too rapid under these conditions, and a consequent souring of the soil ensues. Far better, it would be, to let the plant complete its growth, and allow the foliage to lie on the soil as a mulch for some time during the winter, and plough it under when it has become drier and less succulent. A certain amount of loss would necessarily occur in the ærial part of the plants, but probably as much would be lost were the ploughing in to be done in autumn, and rains were to enter the freshly turned over ground. In colder climates there is less to fear from ploughing in in the autumn, as energetic decomposition is retarded by the cold, and the formation of acid is slow, and more easily dealt with.

The subject has been here treated in general, and has been confined to the manurial side of green crops only. They have an important value as feeding stuffs as well, but it has been thought better to refer to these when the individual crops, and their methods of cultivation, are discussed.

Agricultural Shows.

Lion's River Division, Howick, Thursday, June 27th. Secretary, G. Hutchinson, Balgowan.

Natal Poultry Club. Annual Show, Market Hall, Maritzburg, 1s July. Hon. Secretary J. Anderson, 272, Longmarket Street, Pietermaritzburg.

Ixopo, Wednesday, July 3rd. Entries close June 22nd. Secretary, A. Keith, Ixopo.

Richmond, Wednesday, July 10th. Secretary John Marwick, Richmond.

Alexandra, Umzinto, Thursday, July 11th. Entries close July 2nd. Secretary, R. G. Archibald, Umzinto.

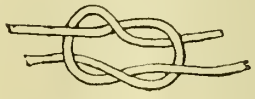
New Hanover, Wednesday, July 24th. Secretary, H. A. Light, York.

Sugar in Veterinary Obstetrics.

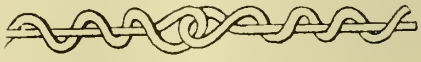
IN December last we drew attention to the use that was being made of sugar in veterinary obstetrics. It was pointed out that Professor Bossi in Italy and Professor Payer in Austria had used sugar with success in cases of delayed delivery of cows, and that many French veterinary surgeons had followed their example. In the "Veterinarian" of February last, Mr. F. C. Mason, M.R.C.V.S., mentions several cases in which he had used sugar as a remedy, with what he describes as astonishing results. Case 1—An aged cow, membranes retained five days, and becoming foul; health beginning to suffer, loss of appetite, and cessation of rumination. Treatment, membranes partly removed, and half a pound of Demarara sugar was given at once in a bottle of Burgundy. The same does was ordered to be repeated in twelve hours. A third dose was given, by which time there was a free evaeuation of semi-putrid membranes. There was a rapid recovery, and the whole course of treatment was completed within three days. Case 2 — A fine, healthy cow, aged about six years. Membranes had been retained eleven days, and were so putrid it was impossible to withdraw them. Treatment—sugar and wine as before, but in this case two doses were sufficient to get a free discharge of membranes and fluids. Owing to the advanced stage of putrefaction of membranes, the uterus was thoroughly cleansed with an antiseptic solution, and in a few days the cow was milking and feeding well. Case 3—A dairy cow just off grass, in wretched condition, and recent delivery of twin calves. Membranes retained very tenaciously and traction useless. Treatment—In this case sugar was again tried with wine, with the result that the second does was sufficient to cause complete emission of the membranes. Two other cases are mentioned by Mr. Mason, in which the same treatment had equally favourable results. In all cases Mr. Mason says he found the sugar himself, well saturated with bol. armen. and left it to the owners of the animals to find the wine. Of this system of treatment he says :—"From my short experience of the use of sugar in this matter, I am inclined to continue its administration every six hours till success comes or purgation results. It is my intention to proceed further with my trials of sugar in 'post-partum' cases, and more particularly to notice (a) if the wine is a useful adjunct, and (b) if treacle has an effect at all similar." A form of inertia subsequent to parturition in cows is not uncommon, and in Australia it is often difficult, if not impossible, to obtain the services of a veterinary surgeon. Where cows have not "cleared" the sugar remedy may safely be employed by any dairyman without danger of bad results following, as might be the case if powerful drugs were administered by unskilled persons.

Wire Splicing.

The Knot Splice



The Loop Splice



The Loop & Twist

The Telegraph Splice

Rearing Chickens in the Spring.

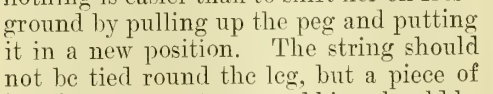
W. D. TEGETMEIER, the well-known English authority on poultry, writes as follows in the "Live Stock Journal" :—

The general rearer, as distinguished from the fancier who breeds birds for the early shows, will now be raising chickens in what may be called the natural season of the year, when the finest and most prolific birds are produced. With the fine weather we may now expect, chickens can be reared in a much more natural and consequently healthy manner than was practical in the previous month. Hens may now be allowed to sit in the open, where they will rear much stronger, healthier, and hardier chickens than if the eggs are taken and kept in a warm room, as they very often are by ignorant fanciers. If it is convenient the eggs should be allowed to remain where the hen lays them. These nests will always produce the strongest clutches of chickens. There is no fear of their being injured by occasional showers of rain or night frosts. The hen adds an egg to them every day or every other day, and when some seventeen or eighteen have accumulated she will usually begin to sit, and in all probability will bring out as many chickens as she has eggs under her. If, as generally happens, the eggs are removed, they should not, as is often done, be brought into a warm room with a fire, in which the air is rendered impure by the breathing of the occupants and by the burning of lights, but they should be placed in a cool, pure atmosphere.

The nest for the sitting hen if not on the ground should invariably be made of damp earth, and no attempt should be made to set the hen in one of a set of close, vermin-haunted nest-boxes placed in rows on a shelf, these being the worst nests that can be imagined. A hen's or pheasant's nest in a natural condition is placed on the damp ground, and the closer we can imitate nature the better. If the hens are set by the owner it is much the best to set if practicable two or three hens on the same day. At the end of a week the eggs should be examined. A hole cut in a piece of cardboard a little less than the size of an egg should be held before a lamp, as shown in the diagram. This should be done in a dark room. If the eggs are sterile, they will look as transparent after being sat on for a week as if new laid, but if they contain a chicken they will be perfectly dark except at the larger end. The clear eggs should be taken away, and if two or three hens are set on the same day, it is probable that the entire lot may be given to one or two of them and a fresh lot to the other, thus preventing the waste of a sitting fowl and doing much to ensure large broods.

The less interference with the sitting hen during the remainder of the period the better, although in some cases it may be necessary to take her off the nest once every day, giving her a full feed of corn, allowing her to dust in a heap or large box of ashes, which should always be provided for the purpose, before returning to her nest. On the twenty-first day, the same day three weeks that the hen was set, many of the chickens, if strong, may be hatched out. They should not be removed from the nest, and put before the fire in a basket lined with flannel—a silly plan pursued by some ignorant persons, which the chickens resent loudly by cheeping in a most unpleasant manner, only to be quieted when returned to the natural warmth of the hen. They should not be fed, inasmuch as they are nourished on the materials of the yolk, which is drawn into the body as the chicken is breaking through the shell. If all be well, on the twenty-second day they are strong and vigorous, and ready to feed. The hen should then be taken out in the open, and if she be cooped should be placed on the ground, not in a coop with a boarded floor, in as warm a position as possible. If practicable, the ground should be that on which chickens have not been reared before, for as great a degree of success on tainted ground cannot be expected as on that which has not been soiled by fowls. The pheasant rearer knows this very well, and never attempts

to rear the pheasants two years in succession in the same field. If he does so it is seriously to his loss. If practicable, the hen should be allowed at large, and the chickens will do much better than if she is cooped. But this plan cannot be followed where there are many broods. In addition to cooping, other plans may be followed. A ring of wire work, 6ft. high, may be made, and the hen, with a box for shelter, placed in the interior. If this is placed on mould or short grass, the chickens will do much better, as the hen will scratch for them, and there is no difficulty is shifting the wire work day by day. Another useful plan is that of tethering the hens, fastening them by means of a long string to a peg driven into the ground, and giving them a box or empty coop in which they can shelter with the chickens at night. This tethering system, where it can be pursued, is much more advantageous than cooping. It enables the hen to scratch for the chickens, obtaining insects and small worms, and nothing is easier than to shift her on fresh ground by pulling up the peg and putting it in a new position. The string should not be tied round the leg, but a piece of thin leather or strong webbing should be taken about 8in. or 9in. long by an inch broad. Two short slits and a hole should be cut in it, as shown in the diagram. A



TETHER FOR HEN (ONE THIRD SIZE.)

and B should be placed around the leg of the hen, and the end C passed through both slits, and if pulled tight will make a secure band round the leg of the hen which can neither be undone by picking or tightened by pulling. The string which is attached to the hole C in the leather should have a loop at the other end, which is placed over the peg, and the box in which the hen roosts should be placed just so far from the peg that the hen can enter into it, and not go behind and twist the string round it. I have always found that chickens reared under featherered hens have thriven much better than those under hens in coops.

As to feeding the chicken, the clear eggs that were removed from the sitting hen on the seventh day answer admirably for the first food, but they should not be boiled hard and chopped up, as is usually done, inasmuch as the yolk is eaten first and the white is very often dried in the sun till it becomes perfectly horny, being useless and uneatable. The eggs should be mixed with a little more than an equal quantity of milk, put into a saucepan by the side of the fire until it sets into a crumbly custard, which is much relished by the chicken. I regard canary seed or dari as much superior to chicken grits, which, having been husked, have the kernel exposed to the air, and in all probability are stale and rancid, whereas the dari or canary seed is fresh, and the husk contains the mineral materials which are essential to the growth of bone in the young fowl. Bread dipped in milk and squeezed dry is also advantageous, and this in a few days should be followed by small wheat, which, if the chickens are allowed to range on fresh ground, is easily digested, and they obtain stones and grit to ensure the grain being ground in the gizzard.

Veterinary Departmental Report for April, 1901.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I HEREWITH enclose the Reports of the Veterinary Department for the month of April.

Cases of infectious disease still continue to be reported from the Northern parts of the Colony, thirty-three fresh licenses having been issued for the supression of lungsickness within the last month by District Veterinary Surgeon Hutchinson. This shows a falling off in the number of licenses issued by eleven, forty-four herds having to be placed in quarantine during the previous month.

The number of cases of contagious disease in other parts of the Colony is less, and it is gratifying to note that no fresh cases of glanders in horses have to be recorded.

The work in the Laboratory has been of the usual routine nature. *Post-mortem* specimens have been examined for the various District Veterinary Surgeons, and reported upon. The usual work in connection with such preparations, as quarter-evil, anti-venomous serum, etc., has been undertaken. A further supply of mallein has been elaborated; examinations of samples of locusts, urine, etc., have been made. Seven hundred and ninety doses of the vaccine for quarter-evil have been sent out. Of locust fungus 179 tubes have been issued; of mallein, 3,010 doses have been sent out, besides small orders for anti-snake serum, anti-tetanic serum, etc.

H. WATKINS-PITCHFORD,
P.V. Surgeon.

GREYTOWN—D.V.S. CORDY.

Scab.—One fresh outbreak has occurred. Mr. ——— was fined three pounds for contravening the Scab Law by not giving notice to the Stock Inspector of an outbreak of scab among his flock.

Lungsickness.—Eight head of cattle on Mr. E. Bentley's farm, Sproxton, York, were placed under their fifth license on the fourth of the month. This is due to the fact that a cow which has been suffering from the disease for several months was still showing symptoms of lungsickness.

Glanders.—None.

General.—Horsesickness has been prevalent. I was called to a case of horsesickness of the pneumonic type, the animal having to be brought home after being driven a short distance, the owner finding him to be unwell. On arriving, I found the animal to be in the last stages of the disease—dyspnœa, very marked—in fact, the breathing could be heard at a great distance from the stable. Although tracheotomy was at once performed, and a solution of iodide of potassium injected into the trachea at intervals, with the administration of small and repeated doses of diffusible stimulants, the animal died about six hours after treatment was commenced.

MARITZBURG—D.V.S. WOOLLATT.

On April 21st I proceeded to the Lower Tugela to arrange and mark off the boundaries in connection with the Proclamation of Zululand as an infected area under the Lungsickness Prevention Act. I returned on the evening of the 23rd. I attended six cases of horsesickness during the month, with no success, however. Two Volunteer horses have been examined, and three horses tested with mallein. These horses were not suspicious of being infected with glanders; they were tested at the request of the owner before going into his stable. They were recent purchases. In the camp for discharged Military transport oxen at Matowan's Kop, Elandslaagte, there were only 228 oxen, belonging to 17 owners. Fifty of these oxen were under license for lungsickness, belonging to three owners. In the clean quarantine dopôt for cattle at Pieters there were 1,403 head of cattle, 330 being admitted during the month. Permits were issued for the removal of 337 oxen from the infected area during the month, belonging to 20 different owners.

NEWCASTLE—D.V.S. HUTCHINSON.

Lungsickness. — Thirty-three fresh licenses have been issued in the Newcastle Division, eight in Umsinga, five in Dundee, and fifteen in Ladysmith. The majority of the cattle licensed have been taken from the Military during the month, in exchange for horses.

Scab.—Eleven fresh outbreaks have occurred in Newcastle Division, and two in Ladysmith, besides the various flocks purchased at the Imperial Government sales, all of which have been placed under license.

Horsesickness.—This disease is rampant throughout the whole of my District.

DURBAN—D.V.S. AMOS.

Glanders.—All the remaining horses of Mr. ——— have been examined weekly, and again tested, with the result that only two horses did not react. These two were shot by the owner, so that every horse now has been shot or has died that was in this extensively diseased stable. A special report deals with this. I am glad to say that no cases have come under observation on the market.

Tuberculosis.—Seven cows have been tested at the compound with tuberculin. I proceeded to Mount Edgecombe to test 63 head of cattle that had mistakenly been sent there by the owner before being tested. In all these cattle there was an average temperature of 104·5 before testing, due entirely to heat and the low condition of the animals after a rough sea journey, and the journey to Mount Edgecombe. After having to wait a considerable time I inoculated them, but no reaction was obtained.

Horsesickness has been much more prevalent, in fact this month has proved the worst as yet of the usual horsesickness season. Blue-tongue has been the commonest form, and the pulmonary type has been the next common. Many horses that have died were stabled animals, fed entirely on dry food, green food being withheld altogether. Some had been taken great care of, even rugged and bandaged every night with other precautions. I have met with no success whatever in treatment. I have tried intratenous injections with subcutaneous injections and internal administration of stimulants. I have tried arsenic and the rum and carbolic acid drenches, with only one result, viz., death.

Lungsickness exists on the Reunion Estate, and is under quarantine restrictions.

Redwater has come under my notice in several cases in imported cattle—commonly Australian cows. No cases have yielded to treatment. It is impossible to allow any imported cow outside the stable door without exposing the animal to this disease. Many beautiful cows have died this month from redwater.

Biliary Fever.—I have treated during the month a good many cases of biliary fever, there having been quite an epidemic. This disease, I am of opinion, is due to some specific organisation. It certainly is contagious. I have not had a fatal case in any instance, though considerable systemic derangement has taken place. Very high temperatures have been recorded in these cases—up to 107·4. I have followed purely a saline treatment, with a laxative diet. A disease that has killed many animals is due, I think, to the entrance of a necrosis bacillus through wounds at the coronet and pastern. It is especially prevalent in stables near the Eastern Vlei. This locality is simply a quagmire in wet weather, and small scratches even are sufficient to allow of infection. The whole tissue around the pastern and coronet simply necroses and sloughs away, whilst the animals suffer agonising pain. Some I have destroyed, and many others have died. The only treatment is an antiseptic bath as a preventive.

IXOPO—D.V.S. VERNEY.

Rinderpest.—From information obtained from the Resident Magistrate, Port Shepstone, I visited a Native, Daza, residing between St. Faith's and Mehlainyama, who had lost several head of cattle from a disease supposed to be similar to rinderpest. On investigation I found that this Native owned fifteen head of cattle, and on the 19th and 20th inst. they all became sick, and by the 23rd inst. nine had died, the remaining six eventually recovering. These cattle were practically well when I inspected them. From the description of the cattle given by the Native, I am of the opinion that the cattle died from poisoning, and the symptoms strongly suggested "tulip" as the cause, or if it was not this plant it was something that possessed very similar toxic effects.

Horsesickness. - This disease has been fairly prevalent, both in the Ixopo and the Polela Districts. I have been very busy, as usual, most of my cases being of an ordinary character, such as lameness, wounds, digestive troubles, castration, fistulous withers, etc.

MOOI RIVER—D.V.S. WEBB.

Lungsickness. – No fresh outbreaks of lungsickness have been recorded.

Scab.—Three fresh outbreaks of Scab are reported.

Horsesickness. — Numerous cases of this disease have occurred during the last fortnight.

Blue-Tongue in Sheep.— This disease has been playing fearful havoc amongst the flocks all over the district.

HOWICK—D.V.S. BYRNE.

I am pleased to be able to state that the Upper Umkomanzi Division is at present free from scab.

The only two farms under license for lungsickness in this Division are those belonging to Mr. H. Gillespie, Stirtrumfontein, and Messrs. Turnbull & Co., Glen Islay, and there are no sick beasts on either of those farms at present.

There are no other contagious diseases in this Division at present that I know of, and stock, generally, are doing well.

Horsesicknees has been rather bad in the Upper Umkomanzi Division this season, fifty horses having died in the last two months, and those were all local horses, not those purchased and brought into the District.

In the Umgeni Division I am also pleased to state there is no scab.

There is no other contagious disease in this Division that I am aware of.

The lungsickness license of Mr. A. Clarke and Natives of Mount Ashley, have, for the fourth time, been renewed, two fresh cases having occurred.

During the month I inoculated seventy calves with your preventive against quarter evil, and in each case successfully.

Lucerne for Dairy Cattle.

THE value of lucerne as a food for dairy cattle has never been properly appreciated in this country, says "Merton" in "The Field," England. I notice that in one of the American States — Kansas — the area cropped by lucerne has increased from 34,000 acres in 1891 to 276,000 acres in 1900. England is not suited in all parts to the growth of lucerne, but it might be grown very much more than it is. I speak with some years of experience of this crop, and do not hesitate to recommend it where it can be grown. At the experiment station, of New Jersey the yield, take in five cuts, last year reached 26½ tons to the acre, the first cut reaching 9 tons, this being taken on May 18, before which date lucerne will be out in this country.

Its value as a green crop is enormous. Taking five cuts, the analysis of each in succession shows that the fourth cut was much the richest in feeding matter, for it contained 5.4 per cent. of nitrogenous matter, and only 69¾ per cent. of water, while the first cut, with 83 per cent. of water and 3.6 of protein, was the poorest. When compared with other foods, a crop of lucerne yielded 2,200lbs. of nitrogenous matter, this being present in 8,250lbs. of dry matter per acre. Maize, also a huge cropper, gave only 5,000lbs. of dry matter and 400lbs. of nitrogenous matter, clover, peas, and trifolium all being below these figures, except that clover contained more protein than maize.

Again, when a ton of lucerne hay is compared with other dry foods, it is found to contain more dry matter than clover, hay, bran middlings, oats, or rice meal, and with few exceptions, more nitrogenous matter. Cows were fed upon two rations, one composed of maize-silage, lucerne hay, grass hay, and 2lbs. of cotton seed meal; the other consisted of the same quantity of the silage and grass hay, but, in addition, there were 10lbs. of bran, dried grains, and the cotton seed meal. There was more protein in the latter ration, but slightly less dry matter, while the cost of the latter ration was much higher.

What was the result? There was a slightly larger quantity of milk produced by the four cows tested, but the cost of production was much in favour of the ration containing the lucerne hay; in other words this ration cost 6d. and a fraction, whereas the more mixed ration cost slightly more than 7½d. The ration produced slightly less butter, but what it did produce cost 6d. a lb., whereas the butter produced on the other ration cost more than 7d. Cows can be fed with economy on lucerne from May to the end of October, and a small area will prevent considerable expense in the purchase of dry foods during summer, and even winter as well.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inanda & Ndwedwe	Lungsickness	H. Gillespie ...	Avoca.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein.
		,,	W. Ralfe ...	Ennersdale.
		,,	F. R. Moor ...	Greystone.
		,,	Cooke & Co. ...	Blue Krantz.
		,,	F. Bloy ...	Monte Christo.
		Lungsickness	Toonyani ...	Chieveley.
		,,	A. & W. M. Henderson ...	Elands Park.
J. Button ...	Estcourt, South of Bushman's River	,,	J. Mattison ...	Klipstone.
		,,	Landalas ...	Kaffir's Poort.
		Scab	H. E. Kirby ...	Klipfontein.
		,,	W. S. Crart ...	Springvale.
		,,	H. J. Hurd ...	Weston T'Lands
		,,	J. W. Haw ...	Woodleigh.
		,,	H. Albrecht ...	Brynbella.
		,,	S. Nel ...	Wagon Drift.
		,,	D. Mackay ...	Dalton.
		,,	R. Mattison ...	Fernhurst.
A. H. Ball ...	Weenen ...	,,	T. J. Van Rooyen	Belle Vue.
		,,	C. Van Rooyen & J. S. Els ...	Scottsberg.
		Lungsickness	Seewa... ...	Baviaan's Krantz.
J. J. Hodson ...	Lion's River ...	Scab	Jas. Morton ...	Tweedie Hall.
		,,	A. S. Parkinson ...	Shafton Grange.
		,,	D. McKenzie ...	Cotswold.
		,,	J. J. Morton ...	Sherwood.
E. J. B. Hosking ...	Upper Umkomanzi	Lungsickness	H. Gillespie ...	Intimbankulu.
		,,	Geo. Hackland & Sons ...	Inhlayuka.
		Scab	H. Nicholson ...	Alton.
R. J. Raw ...	Impendhle ...	,,	R. Gresham ...	Castle Howard.
		,,	P. Ogram ...	Tilletudleni.
		,,	— Roberts ...	Ebrington.
		Lungsickness	Donga ...	Johnstone.
		,,	C. C. Lewis, and Native ...	Clairmont.
W. Wilson ...	Polela.	,,	H. Eaglestone ...	Coleford and The Bungalow.
		Scab	H. Nicholson ...	Fondling.
		,,	A. W. Leggatt ...	Selbourne.
C. E. Hancock ...	Ixopo ...	Lungsickness	W. W. Walton & Natives ...	Dronk Vlei.
		Scab	W. K. Anderson...	Maxwell.
		,,	E. S. Clarke ...	Carr End.
		,,	Malambula ...	Location.
		,,	Qinisani ...	Klipgat.
		,,	R. Kennedy ...	Cornhill.
		,,	A. Watson ...	Rosehill.
		,,	Archibald & Co. ...	High Flats.
		,,	W. Gray ...	Helmsley.
		,,	Momololo ...	Umgodi.
		,,	Natives ...	Langefontein.
		,,	E. H. Surridge ...	Chadwell.
		,,	Rulumeni ...	Farm adjoining Chadwell.
		,,	J. Dalgarno ...	Abercairney.
J. F. Bernard ...	Newcastle	Lungsickness	A. A. Osborn ...	The Mount.
		,,	G. L. Fraser ...	Ingogo.
		,,	J. F. Grant ...	Hilldrop.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle [illegible]...	Lungsickness	J. Mortimer ...	Try Again.
		,,	P. W. Dept. ...	Newcastle T'Lands
		,,	S. Loxton ...	Lennoxton.
		,,	D. Dewar ...	Newcastle T'Lands.
		,,	W. A. Ross ...	,,
		,,	Nehorasing ...	,,
		,,	— Roberts ...	,,
		,,	C. Watson ..	River Bend.
		,,	H. James ...	Kalbaslaagte.
		,,	J. R. Watt ..	Horn River.
		,,	G. Matthews ...	Shakespeare.
		,,	H. Loxton ...	Lennoxton
		,,	A. & S. J. James...	Paradise.
		,,	Vinnecombe & Robson ...	Lennoxton.
		,,	W. R. Bowes ...	Endsell.
		,,	G. E. Jubber ...	Brackfontein.
		,,	Digeto ...	Rooi Point.
		,,	J. E. Calf ...	Chelmsford.
		,,	R. Dann ...	Yarl.
		,	W. L. Oldacre ...	Nil Desperandum.
		,,	A. J. Crawford ...	Newcastle T'Lands.
		,,	C. Collyer ...	Stilazie's Kop.
		,,	W. Adendorff ...	Hope Farm.
		,,	N'castle Corporation	Newcastle T'Lands.
		,,	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		,,	J. W. Goodwill ...	Cornwall.
		,,	Messrs. Wade, Bros.	Macclesfontein.
		,,	Harvey & Ketalbach	Lease 42.
		Scab	H. S. Dicks ...	Lennoxton.
		,,	F. Johnstone ...	Craig.
		,,	J. Dicks ...	Vet Klip.
		,,	F. R. Tewson ...	Rooi Point.
		,,	G. J. Way ...	Vrede.
		,,	J. W. O'Reilly ...	Gordon.
		,,	J. Matthews ...	Shakespeare.
		,,	O. Schwikkard ...	Boscabelli.
		,,	G. Star ...	Lennoxton.
		,,	R. S. Miller ...	Goloch.
		,,	C. G. Palmer ...	Dry Cut.
		,,	W. Dicks ...	Hope Vale.
		,,	S. J. James ...	Stafford.
		,,	J. W. Shuttleworth	Duck Ponds.
		,,	S. W. Reynolds ..	Newcastle T'Lands.
		,,	W. L. Jee ...	Lennoxton.
		,,	J. Davidson ...	,,
		Lungsickness	H. S. Dicks & Sons	The Retreat
		,,	J. W. O'Reilly, Natives Jonas, and Paplana	Newcastle T'Lands.
		,,	L. H. S. Jones ...	,,
		,,	Bob. Salugwanda	Boschhoek.
		,,	J. Davidson ...	Lennoxton.
		,,	A. Danks & Fox...	Crown Colliery. Newcastle.
		,,	J. Smith ...	Lennoxton.
		,,	A. Paine ...	Mount Prospect
		,,	F. W. Hatley ...	,,
		,,	E. Parker ...	,,
		,,	Ramsaroop ...	Newcastle.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness.	G. J. Way ...	Vrede.
		,,	Unjopal & Eseresing	Newcastle.
		,,	A. H. Tatham ...	,,
		,,	G. Brown ...	Wykom.
		,,	Macdonald & Kemp	Lennoxton.
		,,	Natives ...	Whykombe.
		,,	,, ...	Droog Plaats.
		,,	A. Krause ...	Filexton.
		,,	G. W. Nourse ...	Rutti & Highton.
		,,	Simeon Ndhlovu	Freda.
		,,	S. W. Reynolds ...	Newcastle T'Lands.
		,,	O. Olver ...	,,
		,,	R. T. H. Harrison	Lennoxtown.
		,,	G. W. White ...	Ruth.
		,,	C. R. Savory ...	Pomeroy and Evin.
		,,	Dr. Ormond ...	Ingogo.
		,,	Loxton & Rudd	Waterfall.
		,,	L. C. Koch ...	Kabbaslaagte.
		,,	D. Miller ...	Roseleas
		,,	H. Singleton ...	,,
		,,	E. Graham ...	,,
		,,	Cooper & Chandley	Newcastle T'Lands.
		,,	Blizzard & Pratt	Ingogo.
		,,	J. W A. Welsh ...	Paradise.
		,,	H. Austin ...	Wykom.
		,	G. Star ...	Lennoxton.
		,,	G. Wood ...	Heron's Court.
		,,	W. L. Jee ...	Lennoxton.
		Scab	A. J. Debenham...	Knowsley.
		,	G. Wood ...	Heron's Court.
		,,	A. D. Uys ...	Horn River and Mooi Krantz.
A. S. Parkinson ...	New Hanover ..	Lungsickness	E. Boast ...	The Avenue, York.
A. Hair	Umgeni and Borough of Pietermaritzburg	,	T. Dawson ...	Zwartkop.
		,,	C. Oldfield ...	Wilgefontein.
		,,	H. H. S. Moreland	Maudstene.
		,,	W. Oldfield, Natives	Ambleton.
		,,	Jonas	Slangspruit
		,,	J. Neden ...	Wilgefontein.
J. Chaplin ...	Klip River	,,	Discharged Transport Cattle	Matowan's Kop.
		,,	A. H. Spring ...	Reserve.
		,,	A. Armstrong ...	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ...	Grobblar's Kloof.
		,,	Natives ...	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,,	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	Pepworth & Reid	Reitfontein
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein
		,,	J. Peniston ...	Reserve
		,,	W. M. Tollner ...	Weltervreden
		,,	J. Van Whye ...	Ladysmith T'Lands
		,,	G. J. Heslop ...	,,
		,,	H. E. K. Anderson	Gedula.
		,,	Natives ...	Reit Kuil.
		,,	E. F. Gibbons ...	Plaat Berg.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Lungsickness	G. F. & J. Woodhouse	Davel's Hoek.
		,,	Natives ...	Georgina.
		,,	,, ...	Zwaart Kloof.
		,,	G. J. McDuling ..	Waterford.
		,,	Natives ...	Langverwatht.
		,,	,,	Vertrek.
		,,	Nondo Gama ...	F. J. Dewaals' farm
		,,	A. Boers, & Native	Marais Vel.
		,,	W. Neizel, & Natives	Roosboom.
		,,	Natives ...	Doornkraal.
		,,	E. Walker ...	Doornkloof.
		,,	J. Umpbleby ...	Springfield.
		,,	F. N. Nel ...	Catherine.
		,,	Natives ...	Macpherson'a farm.
		Scab	J. H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson ..	Walker's Hoek.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	G. Wetherill ...	Walker's Hoek.
		,,	A. C. Beyers ...	Vaal Krantz.
		,,	A. Krogman ...	Brakfontein.
		,,	M. W. Krogman...	Dreifontein.
		,,	P. Marais ...	,,
		,,	H. Boers ...	Dew Drop.
		,,	G. Spearman ...	Feir View.
		,,	J. Van Reenen ...	Wessel's Nek.
		,,	A. Boers ...	Marais Vel.
		,,	A. Carbutt & J. Good	Natiwaan's Hoek.
		,,	Sparks Bros. ...	Ladysmith.
		,,	J. de-Waal ...	Blaubank.
		,,	F. J. de-Waal ..	Lombard's Kop.
		,,	G. Jones ...	Eland's Laagte.
		,,	J. Umpleby ...	Springfield.
		,,	A. J. Taylor ...	Arnot Hill.
		,,	R. Horsley ...	Warrock.
		,,	Dr. Helps ...	Roosboom.
		,,	Corrigel ...	Koolfontein.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	-- Spence ...	Reunion Estate.
		,,	H. F. Pearson ...	Everton.
W. Freer ...	Upper Tugela ...	,,	W. Caldwell ...	Stampord Hill.
		,,	J. W. Coventry ..	Rangeworthy.
		,,	W. Freer ...	Acton Homes.
		,,	W. O. Coventry ...	Acton Homes.
		,,	G. H. H. Coventry and Native	Rangeworthy.
		,,	J. Reed ...	Roode Bent.
		,,	Borbasee ...	Vrom Draai.
		,,	S. Sharratt ...	Klein Waterfall.
		,,	Natives .	Green Point.
		,,	C. H. Williams, & Natives ...	Kroom Draai.
		Scab	G. H. H. Coventry	Rangeworthy.
		,,	J. M. Wales ...	Fairleigh.
G. Gielink ...	Zululand ...	Lungsickness	M. Titlestad ...	Ntingwe.
		,,	Dinizulu ...	Hlabisa District.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
G. Gielink ...	Zululand ...	Lungsickness	Noiwana ..	Nqutu.
		,,	Natives' Cattle ...	Melmoth.
		,,	Sebambindoda and Natives ...	Kwamagwaza.
		,,	G. Havemann ...	Insuzi.
		,,	Military Loot Cattle	Warbeck, Elizabeth, and Barneveld Melmoth.
		,,	Damusa ...	near Melmoth.
		,,	Ndabazeywana ...	Nqutu.
		,,	Strachan ...	,,
		,,	Jacob ...	Vant's Drift.
		,,	M. Bube ...	,,
		,,	Surrendered Boers	Hlabisa.
		,,	Lufahla Usutu ...	Nqutu.
		,,	F. W. White ...	Melmoth.
		,,	Havermann	Ukandhla.
		,,	J. G. Vanderwesthuyse	
		,,	G. Muller ...	Near Melmoth.
		,,	C. Green ...	Inyoni.
		,,	J. Wantick ...	Eshowe.
		,,	Liversage & Van Rooyen ...	Umhlatuzi.
		,,	Surrendered Boers	Eshowe.
		,,	Mtantana ...	Telezi Ridge, Nqutu
		,,	Mhlamb ...	Sihlunegwana Hill.
		,,	Dr. Case ...	Eshowe.
		,,	Sub-M'jor Lewis, NP	Melmotq.l
		,,	Surrendered Boers	Port Durnford.
		Scab.	H. T. James ...	Prospect.
		,,	Surrendered Boers	J. R. Ortlepp's farm
A. Klingenberg ...	Umsinga ...	Lungsickness	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
		,,	Combrink Bros. ...	Uithoek.
		,,	Mrs. H. Strydom...	,,
		,,	Ngobazane ...	Vermaak's Kraal.
		,,	Usiquantjee ...	Emsita.
		,,	A. Müller ...	Pression and Buffalo Home.
		,,	M. Shebele ...	Freiburg.
		,,	Dr. J. Dalzell ...	Gordon Memorial M.S.
		,,	H. Steyn ...	Craigneathen.
		,,	H. Dedekind ...	Buffalo Home.
		,,	T. Keyter	Pomeroy Town Lands.
		,,	T. Crooks	
		,,	Botha	
		,,	Westbrook Bros.	
		,,	N. Smit ...	Tugela Ferry
		,,	J. Benecke ...	Stone Hill.
A. J. Marshall ..	Dundee ...	,,	Marshall Bros. ...	Cleveland.
		,,	— Haynes ...	Sterkstroom.
		,,	Military Authorities	Maypole.
		,,	Glutz ...	Rocky Glen.
		,,	Thorn ...	,,
		,,	Natives ...	Craigieburn.
		,,	J. Landman ...	Boschfontein.
		,,	J. Davidson ...	Beacon Hill.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ...	Dundee ...	Lungsickness	Natives	Long Land.
		„	„ ...	Carolina.
		„	„ ...	Renier.
		„	L. Hedder & May	Roadside.
		„	Natives ...	Kelvin.
		„	„	Uitsay.
		„	A. Jansen ...	Sheepridge.
		Scab	—Hearn ...	Hatting Spruit.
		„	A. Jansen ...	Sheepridge.
		„	J. H. Erkland ...	Carolina.
		„	F. J. deWaal ..	„
		„	J. H. Reis ...	Longfontein.
W. A. Hutchinson	Alfred ...	„	— Dupreez ...	Jackalsfontein.
		„	W. Stafford ...	Sutherland.
		„	Nqubu ...	Location.
		„	Ngihla ...	St. Mary's.
		„	Nakubana ...	Amaci Location.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	Faku ...	Mount Alice.
		„	A. C. Beyers & Sons	Doveton.
		„	Natives ...	Hungerspoort.
		Scab	G. Spearman ...	Woodlands.
E. Varty ...	Umvoti—Western Portion	„	J. H. Beyers ...	Doveton.
		„	H. Hansmeyer ...	On Rust.
		„	J. M. & J. C. Van Rooyen ...	Pampoennek,
G. N. Perfect ...	Umvoti—Eastern Portion	„	L. J. Nel ...	Welgegund.
		„	J. A. Nel ...	„
		„	Thos. Hill ...	Stolzenvels.
		Rinderpest	Natives Cattle ...	Sobuza's Location.
F. E. Van Rooyen...	Kranzkop ...	Scab	L. J. Potgieter ...	Broedershoek.

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand, have been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
19th June, 1901.

M. J. HIME,
for P. V. Surgeon.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 17th July next :—

Mooi River.—One red ox, stumped tail, right ear clipped, no brands.

Melmoth.—Chestnut mare, aged, 14 hands, white near hind foot, badly marked with knee halter.

The stock impounded as hereunder will be sold, unless previously released, on the 7th August next :—

Eshowe.—Dark bay mare, no brands, short mane and tail, one lop ear, poor in condition, age about eight years. Black goat, white marks on foot and belly, no brands. Five goats, being increase of the above goat, found wandering near Chief Umfungelwa's kraal, and reported by the Chief to the Resident Magistrate, Eshowe.

Estcourt.—Reported by Mike Hatting, residing on and owner of the farm Nokopela, near Tabamhlope : grey mare, no brands or marks visible. Reported by A. C. Harding, of the farm "Meadon Banks," Tabamhlope, on the 10th June : light chestnut stallion, no brands, about three years old, estimated value, say, £3. If not claimed within one month from this date will be sold at Estcourt Pound.

Howick.—A two-year-old black-and-white heifer.

Ladysmith.—Reported by J. A. Dewaal as running the farm "Blauw Bank," on the 14th June: black-and-white heifer, three years old, branded on the right hip WM, left ear swallow tail, piece taken out under side, and piece cut off top side of right ear.

Greytown.—Running on the farm "White Cliff," Umvoti County, and reported by Mr. H. Newmarch as too lame to be driven to the Pound: red ox, branded indistinctly on off hind quarter, near hind leg broken, age about two years. Running on the farm "Stonehinge," Riet Vlei, Umvoti County, and reported by Mr. P. Otto, jun., as too thin and too wild to be driven to the Pound: red heifer, white belly, white stripe over face, branded looks like V on left side.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—There is a slight improvement in prices of Agricultural produce; not that there is any extra demand, but farmers are calculating on the opening up of trade with the Transvaal, and are asserting that they intend holding this season's goods, as they are sure to realise large prices. Many farmers did the same last year, with the result that having become speculators instead of farmers, they were open more than ever to the fluctuations of the market. Even now, last year's crop has not been exhausted, and there are thousands of sacks of old grain still on hand.

Mealies.—Prices on the market have fluctuated between 4s. 3d. and 5s. 9d. per 100 lbs., and mealies privately are being purchased at 11s., 11s. 6d., and 12s per muid, including sack.

Forage.—Very little offering; 8s. per 100 lbs. has been obtained.

Hay.—Some good samples sold daily, at prices fluctuating between 2s. and 3s. 9d. per 100lbs. Bedding from 5s. 6d. to 13s. 6d. per load.

Potatoes.—The several varieties of potatoes offered have realised from 6s. to 17s. 3d. per 100lbs.; sweet potatoes, from 1s. 6d. to 4s. per sack.

Mabele.—Every day large quantities are being offered privately, and the prices on the market have varied between 5s. and 6s. 3d. per 100lbs.

Beans.—Some good samples offered, but some samples have been as low as 3s. per 100lbs.: others, 10s. to 13s. 6d. per 100lbs.

Tobacco.—While some samples have been as low as 1s. per lb., others have reached 2s. 9d. per lb.

Onions.—Although the market is better supplied than it was, prices rule between £1 9s. 2d. and £2 1s. 8d. per 100lbs.

Butter.—From 9d to 2s. 8d. per lb.

Pumpkins.—From 1s. to 5s. 9d. per dozen.

Eggs.—From 2s. to 3s. 9d. per dozen.

Poultry.—Common fowls from 1s. to 3s. 6d. and 4s. each, and some varities have been up to 6s. and 11s. 9d. each; ducks, from 4s. 3d. to 10s. 6d. per pair; turkeys (cocks) 10s. 9d. to 18s. 3d. each, (hens) 3s..7d. to 9s. 6d. each.

Sundries.—Mutton of which there has been a considerable quantity disposed of, has realised between 3d. and 8½d. per lb., pork, from 3d. to 10d. per lb; beef, from 4d. to 8½d. per lb.; bacon, 6½d. to 1s. 0½d. per lb.; ham, 11½d. to 1s. per lb. The question might be asked, Why is there such a difference in the prices of beef, mutton, and pork? The fact is, if customers saw the carcasses of oxen, sheep, and pigs drawn through our streets on hot, dusty days, on dirty trolleys, uncovered, we question if any of them would be tempted to buy at any price.

Vegetables.—Beans, beetroot, cabbages, cauliflowers, carrots, lettuce, peas, onions, celery, tomatoes, and turnips, sold daily.

Fruit.—Australian apples, Avocado pears, custard apples, limes, lemons, oranges, naartjes, pineapples, and pawpaws, comprise the varieties sold.

Wood.—Market fairly supplied, and prices have fluctuated between 6d. and 1s. 1½d. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44. writes:—

General.—A considerable amount of business is being put through, and the majority of firms are busier than for some months past.

Mealies.—The market continues very uncertain, and rates fluctuate almost daily. Small parcels are daily enquired for, and the Transvaal is the principal objective. With railway restrictions removed there is no doubt large business would ensue. About 11s. per bag is the average price paid by the local dealer.

Potatoes—Colonial samples are still excessively high, and there are no large parcels available even then. Considerable supplies of Australian are just in, and these will fill most of the demand from now onwards. Best Colonial Early Rose average 22s 6d., while the best brands of Australian bring 20s. The cooking qualities of the latter are far superior to the local article.

Fodder of all descriptions is scarce, and in demand.

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AND MINING RECORD.

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CONTENTS.

Rinderpest.

THE UMVOTI OUTBREAK.

BY H. WATKINS-PITCHFORD, F.R.C.V.S.

IT will be reassuring to Colonists to learn that up to date no further extension of this disease has been reported from the scene of outbreak in the Umvoti Valley. Every day which passes adds to the sense of security, although it will be some time before we shall be able to consider ourselves sufficiently "out of the wood" to feel secure. Indeed, the cause of the present outbreak of the disease is so obscure as to lend some colour to the obsolete theory of the Spontaneous Origin of Disease. It is a curious coincidence that this fatal malady should have again manifested itself in Natal after an absence of some three years at the same time that it is showing itself in other parts of South Africa. The outbreak in this Colony, however, is as yet happily much more limited in extent than that in Basutoland and on the borders of the Orange River Colony. The fact of these outbreaks occurring at the same time must somewhat shake the faith of those who are asserted to still hold the opinion that the present disease in Natal has been incorrectly diagnosed.

The action of the Government in not destroying "root and branch" all animals, both affected and in contact with the disease, has been called in criticism. While everything is to be said in favour

of such "stamping out" policy when applied to countries under efficient sanitary control, it cannot be forgotton that this same policy alone failed utterly to check the progress of the disease both in the Cape Colony and Natal. Indeed, an extended trial of the reliability of such means of suppressing a virulent disease of the highly infectious nature of Rinderpest must, under conditions such as obtain at present in South Africa, be considered a failure. Such a measure is, of course, of great utility when adopted together with other means for suppression, but to rely solely for the arrest of an outbreak on the slaughtering of the infected animals and those immediately in contact would be to disregard the dearly-bought experience of the past and to run the risk of almost certain failure in the future. In addition to this, when such an outbreak occurs in a Kafir Location and has existed there for some time before detection, even the most ardent advocate of the stamping out system will admit that other measures are imperative if the progress of the disease is to be arrested.

The measures adopted in the present instance consisted in the issue of orders by the Government, upon the confirmation of the outbreak, for the immediate destruction of all animals affected with the disease, or capable of conveying it. Two oxen which were known to be "salted" in 1897 were reserved for the purpose of supplying serum for any further outbreak which might occur. These beasts were immune, and the immunising power of their serum was considered to be greatly enhanced by their recent close contact with the sick animals. These beasts, however, though carefully guarded and perfectly immune, and potentially of the greatest utility in the event of any extension of the disease coming to light, were sacrificed to the public demand to "stamp out," and—trust to luck for the future. Meanwhile the Colony is threatened by the disease from outside. It is a matter for congratulation, however, that a small supply of serum had been reserved from the 1896-97 outbreak, which was available for use on the immediately surrounding herds, and it is interesting to hear, by official advice from Masera, that rinderpest serum is perfectly good and has lost none of its immunising powers by the lapse of time. So there are grounds for hoping that the present Natal outbreak in the Umvoti Valley will be prevented from extending. In addition to these steps, precautions have been taken by establishing a cordon extending round the locality.

The origin of the disease has proved, as I have already said, untraceable, so there is, unfortunately, no warranty for our future safety, but it can be asserted with confidence that Natal will for some years yet be free from the possibility of an invasion of the disease to the same degree as the epizootic of 1896 and 1897. Young stock are undoubtedly susceptible now, and as the animals which were salted during the progress of the late outbreak die out, to that degree we shall become increasingly susceptible.

The policy to be adopted in the event of a future serious outbreak of Rinderpest is a matter for grave consideration. Fortunately we all of us know more of the disease and its treatment than we did five years ago.

The feverish efforts of scientific workers at that time to achieve something which would oppose a barrier to the progress of this fell disease have since been reviewed and tested by scientists in many parts of the world, and in this way the best practical method is being slowly evolved from their efforts.

If one can judge from the present state of our knowledge, the means likely to be adopted for checking the disease will be the temporary or "passive" immunisation with serum alone of animals surrounding the focus of infection, which will itself be dealt with on the principle of slaughtering all infected and susceptible animals.

Both Russia and Turkey have adopted this policy. Here in Natal we should, however, endeavour to preserve a judgment free from bias.

Time alone will show the best method of dealing with this disease, and to the arbitrament of time I submit the issue.

In parts of North America, the Russian mulberry is coming into high favour for fence posts. Recently one firm of nurserymen shipped 150,000 young trees to Shenandoah, Iowa, to be planted and grown expressly for posts.

New Sugar Canes.

A FURTHER consignment of cuttings of new sugar canes has recently been received from the Imperial Department of Agriculture for the West Indies. These were sent from Antigua in exchange for some cuttings supplied to that Island by this Department last year. They have now been handed over to the Inanda Farmers' Association for propagation under similar conditions to those canes introduced from other parts some months back. The following report, furnished by Mr. Alexander Pardy to the Government Entomologist, upon the arrival and condition of the canes will be of interest to sugar planters. Mr. Pardy reports :—

"I have to inform you of the arrival at Verulam on 26th June of the canes sent by the Imperial Department of Agriculture, Antigua, West Indies. This importation, as far as the condition of the cane-cuttings is concerned, has been most successful. All were 'tops.' They were forwarded in a Wardian case, and planted in what appeared to be sand and mould, with which shell-lime had been mixed. The butts of the cuttings extending into the soil were decayed in the majority of cases, but the upper parts were quite healthy, with perfect eyes, and giving promise of good plants. Upon close inspection, unfortunately, many were found to contain a 'borer,' and were also infested with mealy bug (*Dactylopius sp*). Acting in accordance with your wire, all those showing signs of the "borer" were destroyed by fire, together with the case in which they came, and only clean cuttings, from which the mealy bug was removed, were retained and handed over for planting.

"The contents of the case consisted of over 100 cane-cuttings of three varieties, viz., D95, B109, and Naga B. Unfortunately over 50 per cent. had to be rejected, owing either to the presence of the borer or to the rotting of a number of the canes, particularly D95, which, in one corner of the box, had become quite useless for planting, probably through some misadventure during the voyage. Altogether eighty-five cuttings. viz., 25 of D95, 10 of B109, and 50 of Naga B, were selected for propagation.

"The canes were handed over to Mr. H. W. James in the presence of Messrs. L. Acutt and J. Polkinghorne.

"The case was dispatched from Antigua on 8th May, and arrived per *S.S. Kinfauns Castle* about June 22nd. It arrived at Verulam on 27th June, and the canes were handed over for planting on the 28th ; altogether 51 days elapsed between the date of consignment and planting.

"The whole of the cuttings were 'tops,' and unsealed at either end. The good condition in which they were received bears out the previous experience that 'tops' carry better than ordinary cuttings when subject to this method of packing. A number had commenced to throw out roots, but none were firmly set. This time of the year is rather unfavourable for planting, but a piece of sheltered ground has been selected, and and they will be watered if necessary."

With reference to the "borers" observed by Mr. Pardy, the Entomologist furnishes the following remarks :—"The 'borer' referred to by Mr. Pardy, is the larva of a moth, and after examination I take it to be that of the sugar cane moth borer of the West Indies, *Diatræa saccharalis*, Fabr. The discovery of this insect serves to illustrate most forcibly the great necessity there is for the examination of all introduced plants – to which exception has recently been taken with regard to the importation of American fruit trees.

"This sugar cane borer does not occur in Natal, so far as my enquiries and examinations show, and it is very necessary that it should be kept out, not only because it attacks all sugar canes, but also because, like the mealie grub, it feeds upon mealies, imfi, and mabele."

A few scientists have ventured to deny the spontaneous combustion of hay. Farmers who have lost barns from conflagrations which could be traced to no other source were firm enough in their belief that an ounce of such fact was worth a pound of scientific theory which held that heat could not be raised to the point of combustion in the haymow. The question has been investigated recenty by an official of the United States Weather Bureau, who found that fermentation with moist hay may raise the temperature to 374 deg. Fahrenheit, at which high temperature clover hay will ignite. The mooted point may, therefore, be accepted as settled from a scientific point of view.

Feeding Sheep.

ELSEWHERE in this issue will be found a report on the advantage of feeding sheep on hay chaff while green grass is scarce. A Mr. Flower, of Onetree Hill, South Australia, is the writer of the report, or rather "paper," which was read by him before his local Agricultural Society. What he says seems eminently practical, and might be worth essaying in the sheep districts of the Colony. About the quality of the hay nothing is said—whether it is from cultivated or indigenous grass. With windmill power — unfortunately but rarely possessed in Natal — the chaffing would be a matter of but small difficulty. The "Journal of Agriculture," South Australia, from which we take the report, states: "An interesting discussion ensued, Mr. Flower's departure in sheep-feeding being new and somewhat startling to members. With the first appearance of green feed they were aware that sheep lost their zest for dry feed, but there was no doubt that with the scarcity of green grass neither hay nor chaff would be neglected. Members considered Mr. Flower's contention, based as it was on personal and successful tests, was entitled to the serious attention of farmers. In wet weather in particular the waste of hay would be a drawback, but with chaff fed as proposed this would not apply. One member is already making preparations to benefit from Mr. Flower's experience, and others will probably follow in the same line. Members calculated that going by Mr. Flowers' figures a flock of 700 sheep each receiving 1lb. of chaff per day would in four months' time show a minimum profit of £100, taking hay at its present figure. Mr. Flower did not think that a sheep would eat more than 1½lbs. of chaff per day if it could get all it wanted."

Howick Show.

ON the 27th ultimo, the Lion's River Society held its Annual Show. Since the inauguration Show of this Society there has been no break. Every year the Show has been a marked improvement on its predecessor. In the fodder section considerable interest was attracted by a sample of sugar-cane grown in the neighbourhood, and by some manna grown in the Balgowan district. The driving and riding competitions proved a most attractive feature of the Show. Full descriptive reports were published in the daily press.

District Reports.

IXOPO, 18th June.—Since last writing no rain has fallen, but stock look well notwithstanding. In my last report I stated I had completed my hut tax collecting, amounting to about £6,500; this sum was printed as £65. The actual amount paid was £6,483 8s., and the Auditor-General's report shows that last year this Department contributed a larger amount of revenue than any other Magistracy. The number of civil and criminal cases have greatly increased, and I predict a substantial increase in revenue over last year's collection, and yet this is only classed as a second class Magistracy.

FRANK E. FOXON,
Magistrate.

NEWCASTLE, 24th June.—A great many horses have died this season from the usual horsesickness. Lungsickness amongst the cattle in this Division is very bad indeed; wherever you go you hear of cases. Scab is also very prevalent amongst the sheep. The District Veterinary Surgeon and Stock Inspectors are doing good work, and all in their power to stamp the several diseases out, and they deserve great credit for the manner in which the duties are being carried out. The war is to a great extent the cause of much of the spreading of the several diseases. Looted and captured, and generally infected stock is being driven all over the Division. Owners of stock should give notice, as the law requires, when any disease has broken

out amongst their stock, to facilitate the Veterinary Department. The Hut Tax for this year is now collected, the Natives having paid up well. They endured many hardships during the Boer occupation here. The crops, taking them all round, are not good, and all produce is fetching high prices—eggs and poultry are exceptionally high. This is owing to the large number of troops scattered all over the Division. The winter is fairly mild—at the commencement several frosts were severe; there is every appearance of an early spring.

GEO. BRUNTON WARNER,
Acting Magistrate.

NEW HANOVER, 1st July. — There is nothing of importance to relate since my last report, excepting that rinderpest has broken out just beyond the borders of the Division. At a meeting held in the Agricultural Hall for the purpose of considering the advisibility of having a show this year, a resolution was passed that the show should be held on the 24th instant, in spite of the outbreak of rinderpest and the advice of the P.V.S. to postpone the show until better times. A great many of the farmers will not be convinced that it actually is rinderpest, and their contention is that if it is, it would have spread, and could not be checked by quarantining. The farmers, of course, know much better than the P.V.S., for whom they appear to have little gratitude for the prompt steps taken to stop the spread of the disease. Indeed, I have heard of complaints about the disease being declared rinderpest, when at the worst it could only be gall-sickness.

A. RITTER, Magistrate.

WEENEN, 29th June.—The peculiarities of the present winter—which was ushered in by a series of hot north winds such as usually visit us in July and August—are being fully maintained by the cold, grey days, with occasional showers, of the past week. Quarter-evil, surely exceptional in June, has played havoc on farms, while two cases of horsesickness have been lately reported. As regards the latter, however, and in view of the fact that no *post mortem* examinations were made, it is possible that the disease may have been wrongly diagnosed, unless the old theory of immunity, after a fortnight's frost, is to prove false. Lungsickness has broken out in the Impafana Location, but the cause of infection has not so far been traced, as the natives deny the advent of any strange cattle in their District. Scab is reported among a flock of kafir goats, and still exists in a few sheep flocks in the Division. Over a hundred horses purchased by local residents from the military have lately been brought into the village, and a number have already changed hands more than once with increasing profits. The tobacco crop this year has been a record one, but the supply is still far short of the demand. An order lately received by one of the local planters was for three tons of tobacco and five cwt. of snuff; and it is anticipated that with the re-opening of the Transvaal and Orange River Colony markets, tobacco growing, during the next two years, will prove the most lucrative of all agricultural pursuits.

C. G. JACKSON,
Acting Magistrate.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 7th August, next :—

Nqutu.—One Kafir goat. No marks. One bay horse (gelding), height 14 hands 2 inches, black points. shod on fore-feet, branded (triangle) on near hind quarter.

Dronk Vlei.—Brown cow, poor condition and old, slit in right ear, O on right shoulder, little white on nose, left front leg white up to knee, and both hind feet white.

Pietermaritzburg.—Light brown mare donkey, in foal; grey mare, black mark down back, and across shoulders, about 10 hands. Will be sold on the Market Square by the Marketmaster on July 15th, 1901, unless previously released.

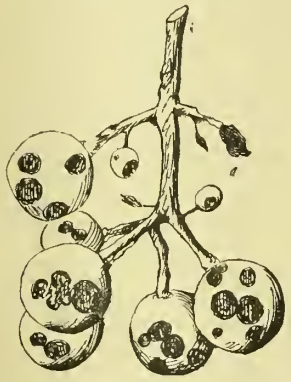
Some Winter Reminders.

By CLAUDE FULLER, Entomologist.

DURING this season of the year insect and fungus pests are not so much in evidence as in the summer months and, following the old adage, are as much out of mind as they are out of sight. It is now, however, that much may often be

done to mitigate the effects of many of them, and with the object of placing a few reminders before readers of the *Journal* these notes are penned.

Grape Troubles.



GRAPES AFFECTED WITH BLACK SPOT.

If Natal does not boast anything very extensive in the matter of grape cultivation, still there are many individuals—particularly dwellers in towns and villages—who have one or several vines. Most of these vines are, of course, the harsh-tasting, but vigorous, Catawba; other finer varieties, however, exist, and these, when free from fungus troubles, produce excellent fruit. The majority, unfortunately, are very subject to both "black spot" and "mildew," both of which diseases entirely ruin the berries, and, to a great extent, the foliage also. Both are essentially summer pests, requiring, in common with other fungi, heat and moisture for their development. During the winter the spores or seeds lie dormant upon the vine, or on the walls and trellis supports, and in the soil, ready to germinate and infest the green growth in the spring and summer. Now a great deal may be done whilst the vine is dormant to mitigate the attack of the black spot disease, and the same measures cannot fail to act beneficially in the case of mildew diseases as well.

The treatment consists in gathering and burning as much fallen foilage as possible, and destroying by fire all the prunings. After the vine is pruned it should have as much of the old loose bark rubbed off as possible, and then dressed—together with any supports or adjoining walls- with some fungicide which will destroy the germs. For this purpose strong Bordeaux mixture may be used, or the following solution :—

Hot water	100 parts
Iron sulphate, as much as the water will dissolve	
Sulphuric acid ...	One part.

This is regularly used in European vineyards, and is highly valued as a winter application. Considerable care has to be taken in applying the solution, as it will destroy machinery and clothing, and, in fact, everything it comes in contact with. It is usually swabbed on with the aid of rags tied on to a stick, and, of course, can only be applied whilst the vines are quite dormant. If this treatment is followed up by sprayings with Bordeaux mixture ; one before the time of blossoming, and one or two after the setting of the berries, stopping when the grapes begin to ripen, the disease can be effectively checked.

Instructions for the preparation of Bordeaux mixture have already appeared several times in these pages, but they may safely be repeated here :—

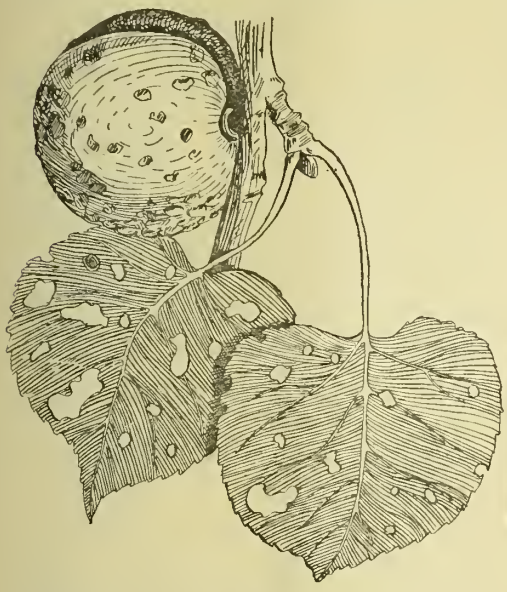
Copper sulphate (best)...	6 pounds
Quicklime	6 „
Water	40 to 50 gallons

Dissolve the copper sulphate in 4 gallons of water, using a wooden vessel. Slake the lime in another vessel, using an equal amount of water. Then mix the two together—this is best done by pouring the two solutions at the same time into a third vessel. The mixture may then be diluted, and is ready for immediate use. In its preparation air-slaked lime should be avoided.

Pruning the Grape Vine.

Apropos of pruning the grape, it may be pointed out here that this can be done when the season's growth has lost its green appearance and assumed a brown or greyish colour. To test this a shoot should be cut, and if it does not "bleed," that is, if there is no flow of sap, it is safe to prune. The exact time will, of course, vary with the variety and with the season —this winter I have found the last week in May not too early for the varieties coming under my observation in Maritzburg. Unfortunately the grape has not had sufficient local study for one to speak definitely upon the effect of early or late

pruning, but it is well to point out that in other countries experience has shown that, in the case of certain varieties which do not set their fruit well, a very late pruning—after the sap has begun to rise—has beneficial effects. In pruning, a pair of secateurs, or pruning shears, should always be used for preference.

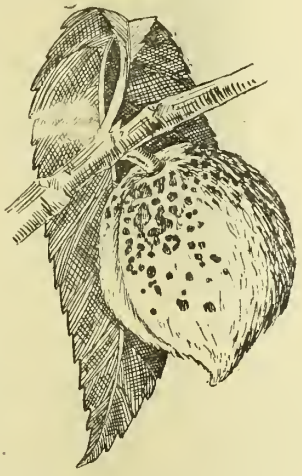


LEAVES AND FRUIT OF APRICOT INJURED BY SHOTHOLE FUNGUS.

Shothole Fungus and Black Spot of Stone Fruit.

Both of these diseases are of a fungus nature. The former attacks apricots, peaches, and plums, whilst the latter is destructive to apricots and peaches only. Shothole fungus is often very destructive to the foliage, particularly that of apricots and some of the finer varieties of peaches. It also attacks the fruit, and gives it a scabby and often uninviting appearance. The black spot is more common upon peaches, and when it first appears upon green fruit has the appearance of numerous small black spots. Subsequently these increase in number and size and form dusky black areas. This disease is becoming very common, and greatly depreciates the market value of the fruit.

The winter treatment for both is the burning of all prunings and a spraying with strong Bordeaux mixture. This must also be followed up by a spring treatment to check the diseases, and as the foliage of the peach is very delicate, the Bordeaux mixture should be considerably weakened, say 1 lb. of bluestone to 15 gallons of water. This should be applied at intervals of ten or fourteen days until the fruit is well formed. Later summer sprayings should be of ammoniacal carbonate of copper, 1 ounce to 10 gallons of water. This is a clear solution and does not stain the fruit.



BLACK SPOT OF PEACH.

White Scale of the Peach.

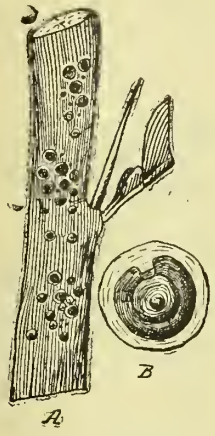
The white scale of the peach is a pest which is gradually becoming prevalent in the vicinity of Maritzburg and Greytown. It is an insect which can be held in check considerably by winter sprayings, whilst the trees are quite dormant, with lime-sulphur-salt solution. Apart from the effect this application has upon the scale insect, it also destroys all lichenous growths and cleans the bark; at the same time it possesses fungicidal properties, and cannot fail to benefit deciduous trees to which it is applied.

The mixture is prepared as follows:—

Quicklime	10 pounds
Sulphur	5 pounds
Salt	4 pounds
Water	15 gallons

Take a large pot which will hold 6 gallons of water, and place in this 3 pounds of lime, the 5 pounds of sulphur, and 3 gallons of water. Boil for an hour or more until all the sulphur is dissolved. Slake the remaining 7 pounds of lime with hot water, and stir in the salt. When

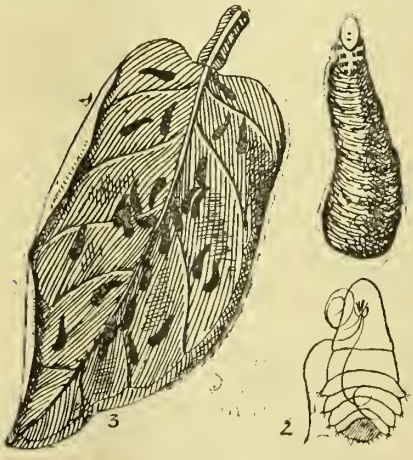
the salt is dissolved mix the two solutions and cook for an hour and a half longer. Then strain and dilute to 15 gallons, and use warm. Keep the mixture well agitated whilst spraying. Be careful not to cook in copper vessels or spray from copper knapsack pumps.



RED SCALE OF ORANGE AND LEMON.

Red Scale and Mussel Scale.

Both these pests of citrus fruits should have attention during the winter, as up to 2,000-3,000 feet above sea level their propagation is not influenced by the climate, whilst at the same time their natural enemies are affected. The dry season prevents the growth of the parasite fungus, which destroys the scale in the summer, and the predaceous and parasitic insects are semi-torpid, and display no activity.



MUSSEL SCALE OF ORANGE AND MANDARIN.

For red scale fumigation with hydrocyanic acid gas, followed by sprayings with resin wash, is recommended, whilst the same wash or paraffin emulsion should be used for the mussel scale. Resin wash is recommended as a winter spray for scale insects in preference to paraffin emulsion, which is more suitable for summer work.

Resin Wash.

Resin	12 pounds
Caustic Soda (98 per cent)	2½ pounds
Fish Oil	1½ pints
Water	50 gallons

Boil the resin, soda and oil with water, and stir until dissolved, then cook for two hours, adding hot water when necessary. Dilute first with 25 gallons of hot water, and dilute with further 25 gallons of cold water when in spray tank. Use warm.

Paraffin Emulsion.

Soap...	1½ pounds
Paraffin	5 gallons
Water	2½ gallons

Use whale-oil, or common bar-soap ; cut up well and boil until dissolved in the water. Whilst boiling add to paraffin. Churn violently, using the spray-pump, to pump the liquid back upon itself, until it is thoroughly emulsified. Dilute, using one part of the emulsion to nine parts of water.

Locusts.

Mr. Stock Inspector Brown's Report.

WRITING on the 1st inst., Mr. Brown, Stock Inspector, Lower Tugela, writes :—" For the whole of the month of June no locusts have appeared in this District. And from information received from residents on the Zululand side, for a radius of twenty miles, no locusts have been seen.

Very little grass has been burnt about here ; the Natives have found out that by burning the grass in large patches the locusts are attracted at the time for laying eggs."

Correspondence.

To the Editor Agricultural Journal.

SOAP SOLUTION ON LOCUSTS.

SIR,—The mealie season is now at an end, and fortunately very little, if any, damage has been done by locusts. Still locusts have been about. On my place at the end of March several fair-sized lots of young locusts had made their appearance, evidently on mischief bent, but luckily for me I am a subscriber and reader of the "Agricultural Journal," so was enabled to avail myself of the latest thing in the way of destroying the foot-gangers.

In previous years I have used fungus and the arsenic mixture. The first needs damp weather to be anyway successful, and the second is rather a nasty article to have about, for there is always a certain amount of danger in connection with poison, however careful one may be, and then there is the great objection, the arsenic mixture cannot be used on the young locusts when once they are in the mealies. The arsenic kills the mealies beyond redemption, so the remedy is very possibly worse than the disease.

In number I., Vol. IV. of the "Agricultural Journal" you published an account of the experiments of Mr. Stock Inspector Robbins, on the use of a Soap Solution on young locusts. I tried the solution and found it most effective. The locusts were very near the fields of mealies, but they never got to the crops—the soap was too much for them. Some of the solution was syringed on the mealies by way of experiment, and no damage resulted whatever. I beg to thank Mr. Robbins for having the thought to experiment in the direction of finding something harmless to mealies, but particularly bad for the locusts, and thanks are due to you for the clear and lucid account you gave your readers of the use of the solution and its results.

Yours faithfully,

F. SMALLIE.

HOW TO IMPROVE THE "JOURNAL."

Sir,—The recent discussion in Parliament on the "Agricultural Journal," and the slighting remarks made thereon by certain of our wise men leads me to make the suggestion that farmers should give their views in the "Journal" itself as to how it can be improved and made more attractive to themselves. As a regular reader of the "Journal" I beg to make a suggestion or two, which I hope will be received in the same spirit in which they are given. My object is solely to help to make the "Journal" a greater success than it has hitherto been.

1. Taking the "Journal" as it is at present, the subject-matter is undoubtedly good as far as it goes. The articles by the Principal Veterinary Surgeon on diseases of stock are valuable and above criticism, while the interviews by "Ergates" are perhaps the most interesting features of the whole paper. These articles should certainly be continued, and "Ergates" may rest assured that they are highly appreciated. Just a word in passing to "Ergates." As a young beginner, only just getting a foothold on the ladder which leads to success, I should be glad to see something more said about the implements used by the principal farmers. These men have, doubtless, tried, and perhaps thrown aside, a good many of the implements which I, in my ignorance, might be tempted to buy, while a word or two from the men who have tried them might be the means of saving me and others a few pounds which we can ill spare. The varieties of implements on sale, English, American and German, are so numerous, that without a practical trial of them it is almost impossible to select the right one.

2. Comparisons were made between the ———— and our own, very much to the disadvantage of the latter. As a

reader of the ———— for some time, I think the only advantage which the latter has is that it contains numerous extracts from American and Australian journals. These extracts are certainly interesting and instructive, and the practice might well be followed here, and as paste and scissors is the easiest way of filling up a paper, there should be no difficulty in satisfying the critics on that point.

3. Get special articles or special subjects and pay for them. Professors of agriculture in England are not above writing special articles for the papers who pay them for it, and we must do the same. To get something for nothing may be considered smart work, but that which costs nothing is generally of little value. Farmers who make a study of a special line and attain success and profit out of it are not going to give away their secrets and invite competition unless you pay them well for it.

Do away with the idea that the "Journal" is run to enable farmers to have an interchange of ideas. Farmers are the worst correspondents in the world; not one in five hundred will ever put pen to paper if he can help it. To depend on farmers interchanging ideas through the "Journal" is to depend on a broken reed. The "Journal" must lead the farmers, not follow them.

4. Give us more science. The Twentieth century is to see science harnessed to agriculture. Show us a better way of tilling the ground than by inspanning six oxen to a '75 Eagle plough turning over one acre a day. We want to see the results of experiments being constantly carried on with manures and feeding stuffs. Show us how to grow twelve muids of corn to the acre instead of six, which is above the average for the whole Colony. Show us the most economical way of fattening cattle to produce beef fit to eat in the shortest time. Show us how to combat Redwater, Lungsickness, Gallsickness and all the other ills which bovine flesh is heir to in this Colony. There is a grand field for scientific agriculture here, and the "Journal" should be the medium through which science can reach the every-day worker in the field.

5. Give more reports of farmers' meetings throughout the country. Let us know what farmers are doing, and what they want to do. Most farmers' Associations have meetings once a month, but what they do and what they say no one but those who happen to be there know anything about it. Let us have condensed reports from all the Farmers' Associations in the country.

6. Give market reports from Ladysmith, Dundee, Newcastle, and Johannesburg.

7. Have a household column. Farmers have wives and daughters, as well as other people, and these would like something to read, something written specially for themselves.

To sum up :—

1. Continue veterinary papers and Interviews by "Ergates."

2. Give extracts from American and other agricultural papers.

3. Special articles on special subjects, and pay for them.

4. Give papers on scientific farming.

5. More reports of Farmers' Association meetings.

6. More market reports.

7. Have a household column for the ladies.

It is to be hoped that others will give their views on the subject, so that we may have eventually a "Journal" which will be a constant source of pleasure and instruction, and one of which the Colony may be justly proud.

GEO. J. WOOD.

Buffalo River, Dundee.
17th June, 1901.

[This letter, which deals with a subject which recently came before Parliament, is published with the sanction of the Minister of Agriculture. The writer is cordially thanked for his suggestions. All suggestions from whomsoever, and whether intended for publication or not, will always receive the most careful consideration.—Ed., "Agricultural Journal."]

Feeding Sheep.

MR. FLOWER, Onetree Hill, South Australia, read the following paper before his local Agricultural Society :—

I think it would pay to feed sheep on hay chaff in times when hay is plentiful rather than let them go low in condition through scarcity of feed. After harvest sheep generally go back, as dry grass will not keep them up. Good wheat stubble has been proved to be a valuable fodder, but it does not last long. If the farmer can contrive to keep his sheep in good condition through this annual crisis he will be in a position to take advantage of the earliest favourable market instead of being compelled to part with them at a serious disadvantage. I have kept sheep for a long time, and I find that the trouble is to keep them fat at this time of the year. When I first experimented with supplementing their feed with hay I had 300 sheep, and turned them into a paddock where there was a haystack. When the paddock was fresh they did not take to the stack, but in a few days they did so, and thrived well. I soon found, however, that the waste through much being trodden under foot was so excessive that I decided to substitute chaff for hay. I had a trough placed near to where the flock watered, filling it at night with chaff, and in the morning it was cleaned out as if it had been swept. After this I bought boards and made half a dozen troughs so that I could feed out about 150lbs. at a time, keeping the sheep away from the haystack. This was in January. At present I am feeding 700 sheep, which I am keeping fit for market. At the end of November last I bought 300 sheep in very low condition. All the land they had to run upon was two paddocks of hay stubble of 100 acres each, and 90 per cent. of them are fat. Feeding should not be intermittent. My sheep are as regularly attended to in this respect as are my horses, the allowance per head being 1lb. of hay and chaff daily. I should use chaff only, to prevent waste, had I feeders enough. Besides what is trodden under foot, the coarse ends of the hay are uneaten, and on this account the hay should be as green and fine as can be procured. I distribute the hay round the chaff troughs, and the sheep feed on either indiscriminately. Given as much as they will eat, sheep will fatten as quickly upon chaff as upon green grass. The difference in condition becomes perceptible after two or three days' extra feeding. When I had only fairly good feed I gave my sheep ½lb. each day per head, increasing the allowance to 1lb. as the feed in the paddock became scarcer. With hay at £1 per ton in stack — the present price— it would pay to feed sheep with, say, 1lb. a head daily. By this reckoning the cost per head for four months' keep would be 1s. 3d. When in January last I commenced feeding with chaff I constructed my troughs V-shaped with two boards, but I found, subsequently, that putting them together on the square with three boards was more economical, more effectually preventing waste, and giving one-third more capacity for the same quantity of timber. Boards, 12in. wide and 1in. thick, of white pine, will make serviceable troughs. One hundred feet of timber will suffice for four troughs 8ft. long, the ends of which can be supplied from such scraps — old binders, drill cases, &c. — as can always be found about a homestead. Boards can be bought in Adelaide at a cost of 18s. 6d. per 100ft., so that three board troughs will cost at the rate of under 7d. per lineal foot. Five 8ft.-troughs will be required for each 100 sheep. In the absence or insufficiency of early rain it would, I think, pay a farmer who has, say, 300 ewes lambing in April to feed them on chaffed hay to keep the lambs going now that the latter bring such a good price. At first there may be some difficulty in familiarising your sheep with this new method of feeding ; but if you round them up, and the troughs are placed close to the water or camping ground, the difficulty will soon be overcome, and they will follow you to the feeding-place whenever you take their feed out.

Fungus Infection of Locusts.

THE following is a report by Stock Inspector Hutchinson, dated 1st June, 1901, of fungus infection of locusts.

Stock Inspector Hutchinson to Minister of Agrieulture.

I received instructions from Prineipal Veterinary Surgeon to infeet as many swarms of locusts as possible with fungus, and forward accounts and reports direet to Commissioner of Agrieulture.

On reeeipt of fungus in January last I infected swarms in Hlangwini, and Umlotshwa and Amamguswa locations, and the Crown Lands in the upper part of the eountry; Mr. Fayle, Superintendent, Native Loeations, was working in the lower parts. I also sent fungus to Messrs. Boddy and Furness, farmers, whose erops were being destroyed by young loeusts, and to others in the neighbourhood, and instrueted them how to use it.

At first, during the dry weather, there appeared to be no result, but later swarms began dying in Amamguswa location and in other parts.

I sent a sensible native who had been working with me to the chiefs in the loeations, and he did very good work with good results, using fungus, and also eolleeting dead locusts and using them.

I found after a few days' work that the natives with my man's help and instruetions were doing well by themselves, so I left him to go from kraal to kraal and instruet them, as it seemed a waste of time and expense to do the infeeting myself personally. The European and half-easte farmers also did good work after I had sent or taken them fungus, and shown them how to use it. I was altogether six days at work. I started the native Dumasile at work on the 11th January, and kept him eontinuously at it, reporting to me every few days till 11th May, at 1s. per day. The loeusts, by that date, were on the move, and leaving the district, so I did not eonsider that any more eould be done.

I hoped at one time by sending the man round from kraal to kraal that I would be able to get all the kraals to help in eollecting and using dead loeusts, but the results were not quiek enough to please them. When swarms died (in reality from previous infeetion), they worked enthusiastieally, but lost faith in it if swarms did not immediately die from their work. However, on the whole we partly killed a good many swarms. They were all willing to use the fungus, but with the exeeption of Amamguswa's, would not eolleet for use dead loeusts. Mr. Boddy had good results from my fungus and instruetions, and was greatly pleased with the effeet of the fungus.

1st June, 1901.

The May Rainfall.

EXCEPT in parts of the Coast, the rainfall for May was insignifieant. At the Cornubia sugar estate there was sufficient to bring up the rainfall for the eleven months to over 50 inches—the top record of the returns. Mid-Illovo (Gorton) stands at the other end, with a rainfall of 13.24 only. Our Ematoma correspondent, writing on the first of this month, states that no rain had fallen, and continues:—"For the last 26 days the weather has been very dry, and a most unusual season has set in, aeeompanied by a strong north-west wind, lasting several days, entirely stripping mealies of all foliage, and giving them the appearance of having suffered from a severe hailstorm. We have had some very severe frosts during the past ten days, thus checking the long spell of horsesickness and blauwtongue. The cold has been very intense, causing stock to lose eondition rapidly.

Eland Breeding.

A PROFITABLE INDUSTRY.

MR. C. A. BENBOW, writing to the *Agricultural Gazette* of New South Wales, strongly recommends the breeding of eland in the drought-afflicted portions of Australia as a pastoral industry. Much of Mr. Benbow's lengthy article is devoted to showing the similarity of the conditions, especially in plant life, of South Africa to those of Australia. The following is a condensation of the article :—

. . . There are apparently only two courses to resort to in dealing with this vast inland scrubby and dry belt. The scrub cannot be killed, *then* try to use it or leave it alone ; sink no more money trying to force the land to accommodate that for which nature has not fitted it, either as to vegetation or by its rainfall.

How use it ?—By putting an animal on the scrub lands that will eat it, whose natural food it is, that will fatten on it, that requires not much water, and can travel for what it wants. Can such an animal be found ?

But before anything more is written it would be as well to quote from an English paper, the *Spectator*, which, under the heading of "Wanted a New Meat," says the following :—"The lack of variety in those meats which, whether flesh or fowl, must always form the groundwork and basis of an English bill-of-fare, is a want keenly felt, but most difficult of remedy. To judge from the list of fresh food which the improved transport of the last few years has made available for the London dinner table, a natural inference would be that, so far as novelty has been studied, we had made provision, not for man, as humanized by schools of cookery, but for a race of fruit-eating apes. We have a dozen new fruits, shaddocks limes, custard apples, bananas, pines, Italian figs, pomegranates, liches, ground nuts, gourds, water-melons, and avocado pears. But among the thousands of tons of foreign game imported yearly, there is hardly a beast or bird which may not be had in better quality and condition at home, except the prairie-bird and the quail ; for those canvas-backed ducks which escape the keen search of the New York dealers' and find their way across the atlantic' alight only on the tables of city companies and millionaires, like the Caladrus of old, that appeared only at the death of kings. Yet there are probably twenty people in this country who have eaten canvas-backed ducks for one who has ever tasted swan, or rather cygnet, the finest water fowl for the table, alike in size and flavour, a bird easy to rear, most prolific, rivalling even the breast of a teal, without the fatal drawback of that excellent little bird, that no one has ever been able to get enough of it. Even now, though so neglected by the world, swans may be had from the Norwich Swan Pit for £2 each. They weigh some 16lbs., and with them is forwarded an ancient receipt for cooking them, 'done into rhyme by a person of quality.'

"Another 'fowl' which was once reserved for the table of kings, and is now hardly thought good enough for aldermen, is the peacock. What roast swan is to roast goose, such is roast peacock to roast turkey. Many owners of country houses who keep peacocks and let them run wild and nest in their woods and shrubberies take little trouble either to fatten or cook the pea chickens. If they did they would perhaps take more pains to rear these birds for the table. The meat is very white, and of exceedingly fine and close grain, and has the true game flavour and none of the stringiness of the common turkey. The American wild turkey is, however, an even finer bird for the table than the peacock. Those which appear in the poulterers' shops of London generally arrive in such bad condition from careless packing and refrigerating that they are inferior to the domestic bird. But when allowed to run wild and nest in English woods, as is done on some estates, on its merits, and apart from any tricks of cookery, it is, perhaps, the very best land bird that is available for food. The game flavour is not too pronounced, but gives a character to the whole which is altogether absent in the tame black turkey of the farmyard.

"But flesh and not fowl is what is mainly desired to widen the possibilities of the dinner table. Fatted swans, or peacocks, or American turkeys, might be increased and multiplied without affording more than an occasional relief to the monotony of the menu and brain-searching of housekeepers. What is wanted is some new and large animal whose flesh has a character of its own which would readily distinguish it from beef or mutton and an excellence which shall make it independent of any special treatment in cookery—something which shall combine the game flavour with the substantial solidity of a leg of mutton. An increase in the quantity of vension reared in this country naturally suggests itself, and it is not impossible that in neglecting the produce of our deer parks we are hardly less careless than in losing sight of the culinary possibilities of the swannery. Good doe vension may be bought in the neighbourhood of some large parks at a much lower price than mutton; and the quantity of first-class venison which finds its way to London is surprisingly little considering the number of parks and private herds in the country. It is objected that deer can never pay to fat for table, because the animal growth of the horns reduces them so much in condition as for a time to make the venison worthless. But this applies only to the bucks; stags might be kept like bullocks, and doe venison might still be remunerative. As early as 1740 an enterprising Jersey squire of the name of Chevalier, who had succeeded to an estate in Suffolk—whose descendants still constantly sit in Parliament—had formed a small park for fattening deer and sending them up to London. His accounts of the cost and profits of the enterprise are still preserved, and he abandoned the scheme, not from difficulties encountered in fattening or selling the deer, but because of the uncertainty of carriage to London. Venison even when reared under the present unscientific method, or rather want of method, varies greatly in quality, that from certain parks being much superior to that grown on less suitable pastures, and it is not too much to hope that if bred and fattened solely for the table venison would be in demand as something more than an occasional luxury.

"But swan, peacock, and venison are after all only revivals of the old bill of fare which was available in the households of old England. To find a new meat we must take stock of the world's resources of animal food, and enquire after due survey if there does not still exist some neglected quadruped which will furnish what we seek. Roughly speaking, our main supply of animal food is drawn either from the rodents, the ruminants, or the pachyderms, represented by the rabbits, the ox or sheep, and the pig. To vary the supply at our disposal we shall probably not be able to go beyond these limits, for the general experience of civilized man has already pronounced judgment on the question and science supports the verdict. It is no good to eat a wolf, for the wolf has already got the benefit of eating the lamb, and left no surplus for us. Of the three great tribes the rodents may be dismissed from our search; for those that are not already used as food are either too small to be used, as the lemming or the guinea pig, or too repulsive in appearance like the capybara, or in habits like the rat. Of the pachyderms we find only one which is domesticated for food, the dear familiar Berkshire or Yorkshire piggie. The large pachyderms are too big; the smaller like the peccary too savage, the wart hog and other African varieties too repulsive. Clearly, then, we must have recourse to the list of ruminants if we are to find one to add to this British bill of fare. At first the choice seems wide enough. It embraces all the deer tribe, the wild sheep and antelopes, goats and ibexes, which are numerous, but all have a rank and disagreeable flavour which must prevent their coming into the list of first-class food. The possibility of extending the supply of venison we have already considered. The wild sheep would probably differ too little in flavour from mutton to make it worth while to domesticate them, though those of the Himalaya will breed freely in confinement. The antelopes therefore alone remain, and it is among their number that the animal wanted must be found if it is to be found at all. If the accounts of African hunters are to be relied on, the venison obtained from the larger kinds of antelopes found in South and Central

Africa is really excellent, that of the koodoo, the oryx, and the eland being the best. Perhaps the highest and most modern authority available for quotation on the subject is Lord Randolph Churchill, who 'made an excellent supper off stewed roan antelope' on the eve of his encounter with the lion. His Lordship's verdict on the eland, the flesh of which is said to surpass that of all other antelopesas much as Welsh mutton does Lincolnshire 'teg,' will be of material interest to the present enquiry. Less educated palates have pronounced it 'peculiarly excellent,' having in addition the valuable property of being tender immediately after the animal is killed, which makes it much appreciated in Central Africa, where the meat is usually as tough as shoe leather and nearly as dry. In addition to the quality of the meat, the eland has the additional requisite of large size. A full grown eland is as large as a two-year-old shorthorn, and has far more the appearance of a high-bred bullock than an antelope. Its horns are short and straight, pointing backwards, and it has a dewlap like an ox. It can live on the hardest fare, and soon grows very fat on good pasture. But best of all it becomes quite tame, and is easily acclimatised. The writer remembers to have seen a splendid group of these fine animals in the Jardin d'Acclimatation in the Bois de Boulogne, an old bull nearly sixteen hands high, a cow, and two young—apparently a yearling and a two-year-old. They were in good condition though living in a paddock with only an open shed to shelter them from the weather. The late Lord Derby kept them at Knowsley Park for many years. It seems to be a waste of the resources of nature to allow these fine creatures to be exterminated as they soon will be in our new South African Empire. The argument that because the South African natives have not tamed them we should not attempt it is of little force. The African keeps cows to give milk; meat was supplied in inexhaustible quantities by the wild antelopes until the white man came with guns, and with far less trouble than domesticated animals give. We are far too apt to forget that England owes the best of her trees, vegetables and animals to other countries. All are now so good that we are prone to think that they can neither be added to nor improved. Perhaps Admiral Rous was right when he declared that it made him 'simply sick' when an 'Arab cross' was suggested as a means of improving our thoroughbreds. But why should we not save the eland, the *harness antelope*, the koodoo, and other large African antelopes from extermination, and even try to rear some in England? The experience may be recommended to some of the noble owners of parks and chases who have already done much to preserve our own deer and wild cattle from extermination. America has allowed the bison to perish, shall we not take warning and preserve for our own use the splendid African antelopes which within the memory of man were a thousand times more numerous than they are today?"

The foregoing shadows a demand for a new meat in Europe. The Americans have established an industry, mentioned in the *Scientific American*, on the Island of Los Angelos, California, for the wholesale cultivation of a hybrid called the Belgian hare (rabbit and hare), which finds a ready and profitable sale. This is a very small matter, but the only one civilization can claim; there is nothing but beef and mutton and pork. So let us enquire about the eland and see if it is fit for Australia, and if it can fall to our lot to supply a new meat to Europe and America.

In Africa the newly-born calf is the fair prey of the lions, the hyænas, and the hunting dogs; all absent in Australia (or only represented by the less harmful dingo). This cause will account for the "it is said," which is from hunting boo s, arising from the remark that in herds only some of the females had calves at foot, but which statement is contradicte l by the average of increase in Mr. Booysen's herd. An animal which matures in eighteen months would certainly breed annually.

From "Beeton's Book of Household Management" we gather the following:—"Viscount Hill, at Hawkestone Park, Salop, killed one from his park for the table. He weighed 1,176 lb. as he dropped; huge as a shorthorn, but with bone not half the size; perfect in form,

bright in colour, with a vast dewlap. Travellers and sportsmen say that the male eland is unapproachable in the quality of its flesh by any ruminant in South Africa; that it grows to an enormous size, and lays on fat with as great facility as a true shorthorn, while in texture and flavour it is infinitely superior. The lean is remarkably fine, the fat firm and delicate. It was tried in every fashion, braized brisket, roast ribs, broiled steak, filet santi, boiled aitchbone, etc., and in all gave evidence of the fact that a new meat of surpassing value had been added to the products of the English park." These animals there, were *left to roam at large* and allowed to return to their home at pleasure. I wonder how large. This is truly funny:—"Here, during winter, they are assisted with *roots* and hay, but in summer they had nothing but the pasture of the park." How funny this is will be understood when we consider its natural food presently.

From "Chambers' Encyclopœdia": "It is described by Livingstone as the most magnificent of all the antelopes. It is sometimes called bovine antelope. because it approximates the ox tribe, having a broader muzzle, less slender limbs, and greater bulkiness of form than the antelopes in general. It is as large as a horse, fully 5 feet high. Its tail very much resembles that of the ox, and terminates in a tuft of long black hair. It is a gregarious animal and the herds are often large. It is generally very fat and not difficult of pursuit; its gentleness also increases the facilities of the hunter. Its flesh is very much esteemed, particularly the muscles of the thighs, which are dried like tongues. It is surprising that no attempt has been made to domesticate, for useful purposes, an animal so easy of domestication and possessing so many valuable qualities."

Dr. Burchell, from whom I am going to quote, is so far a recognised authority that his name has been given to animals, as *Zebra Burchelli*, in our Museum; and to plants all through the *Flora Capensis*, a book, still incomplete, but being issued to the order of the Cape Government, by the Royal Kew Herbarium, to which institution Dr. Burchell presented 135,000 specimens of plants, very many new to science.

Page 311—"Of the meat of a young eland, which happened to be in good case, I made my dinner, and considered it better tasted than the finest beef; with which in grain and colour it might be compared. It seemed to possess a pure game-like taste, which rendered it both wholesome and easy of digestion.

"Within the colony this animal is becoming daily more scarce; the Boers, as well as the Hottentots, preferring its meat to that of any other antelope, and, therefore, on every occasion hunting it with the greatest eagerness. The principal cause of this preference, and at the same time a very remarkable circumstance, is its being the only one of the antelope genus on which any considerable quantity of fat is ever to be found, no other species yielding a hard fat from which candles may be made. This remark, which probably may be applicable to the whole genus of antelope, and presents another character of distinction between that and cervus,* is offered with certainty in respect only to those of Southern Africa, amounting to about twenty-six species, three-and-twenty of which have occasionally served me as food in the course of my travels. In the afternoon I observed with telescope one of the hunters, who was on horseback, following an eland, which was coming towards us. It is a practice, whenever it can be done, to drive their game as near home as possible before it is shot, that they may not have to carry it far. This was the case at present; and the Hottentot drove it on before him with as much ease as he might have driven a cow This poor creature, to which I was indebted for so favourable an opportunity of obtaining, without hurry, a careful and correct drawing of the species, appeared so mild and harmless, and had such gentleness and so much speaking solicitude in its beautiful clear black eye, that I could not witness its fall." (Dr. Burchell never shot anything, but employed huntsmen to find food; he was of great wealth, travelled for amusement—in the interest of botany, if anything else.) "This animal was a male, measuring in length from the base of the horns to the insertion of the tail 7 ft. 7 in., in height, from the wither, 5 ft. 10 in., and in circumference 7 ft. 6 in.

*Red Deer.

"The eland, called 'kanna' by the Hottentots, is a handsome animal, of a stouter make than the other antelopes, yet still possessing much elegance, to which its straight, spiral horns, pointing backwards, and thin legs, in a great measure contribute. While young they are fleeter than the generality of Cape horses, but when old their bulk, especially the males, renders them heavy and more easily overtaken. Their fur, or, more properly, hair, is most frequently thin and short, and in colour a uniform brown, in some approaching to a bluish ash colour, in others to sandy hue. From the other antelopes it is distinguished by a remarkably large dewlap, and is, when at its full size, estimated to be generally larger than an ox, with respect to the quantity of flesh." Vol. II. p. 194. "These unfortunate animals were not allowed to rest in safety either by day or night, and were now pursued by more formidable enemies than lions. Their flesh being, as before remarked, much superior in taste and in fatness to nearly all other kinds of game, they were always, by preference, chased by the Hottentots, while other animals were passed by unmolested."

By favour of the Minister for Mines and Agriculture I can include the most important piece of information. It is more to the point than any of the preceding, and is a letter explaining itself :—

Office of the Civil Commissioner and
Resident Magistrate of Graaff Reinet,
15th October, 1900.

DOMESTICATION OF THE ELAND.

The Under Secretary for Agriculture,
Capetown,—

In compliance with your letter No. 2,843/3,299 of the 4th ultimo, I have the honour to report as follows :—

Mr. Isaac Booysen, of Klipdrift, alone has elands. The father of Messrs. Booysen received, in November, 1892, a year-old bull, and early in 1893 a year-old bull and heifer, and towards the end of 1893 two young heifers.

The first calf from them was reared in 1894, and although seven have been sold, viz., one bull to Mr. Rhodes, one bull and heifer to Mr. Newbury in the Orange River Colony, and two bulls and two heifers to Europe, and six have died, viz., two heifers of inoculation, one cow from poison, two calves and one bull accidentally killed —Mr. Booysen has since kept two bulls, four cows, two heifers, and one young bull calf. The heifers take the bulls at from fifteen to eighteen months. One cow dropped a calf on the 11th July last year, and on the 3rd June this year she had another calf. The first calf was reared by hand.

The herd is kept in an enclosure with wire fence about 7 feet high, which they can easily jump, but do not trouble to do so, as they do not seem to wander about much. They eat grass and karoo, but prefer bush of every kind, even eating the bitter aloe. They, however, destroy a good number of trees, snapping fair-sized branches with their horns. They grow faster than cattle, are easily tamed, and the bulls, unlike most game, do not become vicious when domesticated. They keep their condition well, and can do without water for a long time. M. Booysen tells me the herd has not had water for the last four months. Of course, on the farm there is an abundence of succulent bush, such as spekboom, &c.

A large bull taken off the grass will weigh about 1,500lb., while a cow will weigh from 600 to 700lb.

Mr. Booysen easily obtains from £150 to £200 for young pairs.

(Signed) ARTHUR S. HOOLE,
Acting Civil Commissioner.

Mr. Booysen obtained two bulls and three heifers. The first calf was born in 1894, since which time he has—

Sold	... ...	7
Died from accidental causes	...	6
On hand of increase	...	4
		17

at £150 per pair = £1,275 ; had he not been unfortunate, the increase is fair.

What can the English parks do for the world ? If they would, they could not. The climate there does not suit, the food there is artificial. No mimosa, no karrodoorn, no kanna bosch, no spekboom ; but hay and roots in winter houses ; yet they live, but it must affect their breeding and the flavour of the meat. Many animals will live on other than their natural diet, but the natural craving is

there, for nature will for ever assert itself, and allow but few liberties. The winter with snow and ice is quite out of their natural temperature. Nine young elands have been born in the Zoological Gardens, England, since 1883; Mr. Booysen has had seventeen since 1894. I cannot find out, but I doubt much that the original stock was about the same, namely, three cows in the first instance. We are told that these animals weigh 1,500lb., it is quoted as even up to 2,000lb. Castration with horses increases the size, so it does with cattle, and refines the flesh. Bull beef can scarely be eaten. So far, the elands have not been tried. They are not in the full sense wild animals naturally; it is to be expected that this would further tame them, and increase their size, and the delicacy of the meat. It might be as well to consider the effect or difference in rearing stock under supervision that would prevent in and in breeding, such as takes place when animals run wild. Horses in this country become "brumbies," or deteriorate from this cause, and the domesticated eland would, no doubt, be raised to a higher class than the wild ones.

Mr. Griffiths says that £17,700 has been spent upon scrubbing Nymagee Station fruitlessly. Suppose half that sum had been spent in stocking with the eland—what would be the value of that property now? Suppose all or half the money that had been spent upon trying to acclimatise the salmon had been laid out in bringing the eland to Australia, we should have herds here now that would have converted our scrubby western lands into a reproductive region.

The first commander of the Dutch settlement at the Cape, Van Riebeck, records in his diary that there were elks or elands in the neighbourhood of Cape Colony. That was in the year 1652. The latitude of the Cape is 34 south. This crosses Australia just above the junction of the Darling River and the Murray River.

Mr. Mark Lingard (for the Surveyor-General, Agricultural Department of the British South African Company, Salisbury) states that the eland in Southern Rhodesia is classified as Royal game, and can only be captured and shot for scientific purposes, and then only with special license from His Excellency the High Commissioner.

What is this but putting a high value upon the animal that should be on our back blocks? Why so protected? Because it is highly valued and sought for by people for profit, its hide being especially valuable for leather, causing it to be called the "harness antelope."

Mr. Rhodes has elands at "Groot Schuur," near Capetown, which are domesticated and breed there (*vide* the Under Secretary of Agriculture's letter, of Capetown). Lord Derby has a herd at Knowsley Park; Lord Rothschild, at Tring, also has some; Viscount Hill, at Hawkestone Park, Solop, killed one from his stud. None of these gentlemen had what every western squatter in Australia has—"the eland's home," with its natural foods, instead of roots and hay, for its winter food.

There are three varieties, as mentioned by Mr. Etheridge, of the Australian Museum, but the Cape variety appears to be the best. The animal is described, its value for meat, for fat, and for its hide, which must have some peculiar properties because valued for strong gear in a land of oxen. Its foods are examined into, and it is shown that Australia is stocked with identical and kindred plants to those of its native land, for it appears to be an animal with various tastes, and may pick at other bushes than those named as specially its foods. The animal—like a goat—may have a trick of pawing its foods to break down thorns; if so it may eat the prickly-pear, as well as the prickly wattle, which contains much water, the which, in Africa, it obtains by eating the spekboom, a plant of the pig-weed class of vegetation.

The importation and adoption of this animal can be no experiment, but become at once an interesting addition to our animals, adding to the value of our country, its assets, and ultimately its exports, and ensure results that are not now expected.

In the *Gardeners' Chronicle* appears the following:—"An apple a day, sends the doctor away. Apple in the morning, doctor's warning. Roast apples at night, starved the doctor outright. Eat an apple going to bed, knock the doctor on the head."

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	W. Ralfe ..	Ennersdale.
		,,	F. R. Moor ...	Greystone.
		,,	Cooke & Co. ...	Blue Krantz.
		,,	F. Bloy ...	Monte Christo
		,,	— Maritz ...	Springbank.
		,,	Jas. Ralfe ...	Frere.
		Lungsickness	Toonyani ...	Chieveley.
		,,	A. & W. M. Henderson ...	Elands Park.
J. Button ...	Estcourt, South of Bushman's River	,,	J. Mattison ...	Klipstone.
		,,	Landalas ...	Kaffir's Poort.
		Scab	H. E. Kirby ...	Klipfontein.
		,,	W. S. Crart ...	Springvale.
		,,	H J. Hurd ...	Weston T'Lands
		,,	J. W. Haw ...	Woodleigh.
		,,	H. Albrecht ...	Brynbella.
		,,	S. Nel ...	Wagon Drift.
		,,	D. Mackay ...	Dalton.
		,,	R. Mattison ...	Fernhurst.
		,,	C. C. Randles ...	Glen Lyndon.
A. H. Ball ...	Weenen ...	,,	T. J. Van Rooyen	Belle Vue.
		,,	C. Van Rooyen & J. S. Els ...	Scottsberg.
		Lungsickness	Mgina... ...	Location
J. J. Hodson ...	Lion's River ...	Scab	Jas. Morton ...	Tweedie Hall.
		,,	A. S. Parkinson ...	Shafton Grange.
		,,	J. J. Morton ...	Sherwood.
		,,	A. C. Thomson ...	Fort Nottingham.
E. J. B. Hosking ...	Upper Umkomanzi	Lungsickness	H. Gillespie ...	Intimbankulu.
		,,	Geo. Hackland & Sons ...	Inhlayuka.
		Scab	H. Nicholson ...	Alton.
R. J. Raw ...	Impendhle ...	,,	R. Gresham ...	Castle Howard.
		,,	P. Ogram ...	Tilletudleni.
		,,	— Roberts ...	Ebrington.
		,,	C. P. Spiers ...	Mount Park.
		Lungsickness	Donga ...	Johnstone.
		,,	C. C. Lewis, and Native ...	Clairmont.
W. Wilson ...	Polela	,,	H. Eaglestone ...	Coleford and The Bungalow.
		Scab	H. Nicholson ...	Fondling.
		,,	A. W. Leggatt ...	Selbourne.
C. E. Hancock ...	Ixopo ...	Lungsickness	W. W. Walton & Natives ...	Dronk Vlei.
		Scab	W. K. Anderson...	Maxwell.
		,,	E. S. Clarke ...	Carr End.
		,,	Malambula ...	Location.
		,,	Qinisani ...	Klipgat.
		,,	R. Kennedy ...	Cornhill.
		,,	A. Watson ..	Rosehill.
		,,	Archibald & Co. ...	High Flats.
		,,	W. Gray ...	Helmsley.
		,,	Momololo ...	Umgodi.
		,,	Natives ...	Langefontein.
		,,	E. H. Surridge ...	Chadwell.
		,,	Rulumeni ...	Farm adjoining Chadwell.
		,,	J. Dalgarno ...	Abercairney.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle	Lungsickness	A. A. Osborn ...	The Mount.
		,,	J. F. Grant ...	Hilldrop.
		,,	J. Mortimer ...	Try Again.
		,,	P. W. Dept. ...	Newcastle T'Lands
		,,	S. Loxton ...	Lennoxton.
		,,	D. Dewar ...	Newcastle T'Lands.
		,,	Neborasing ...	,,
		,,	— Roberts ...	,,
		,,	C. Watson ..	River Bend.
		,,	H. James ..	Kalbaslaagte.
		,,	J. R. Watt	Horn River.
		,,	G. Matthews ...	Shakespeare.
		,,	H. Loxton ..	Lennoxton
		,,	A. & S. J. James...	Paradise.
		,,	G. E. Jubber ...	Brackfontein.
		,,	Digeto ...	Rooi Point.
		,,	W. L. Oldacre ...	Nil Desperandum.
		,,	A. J. Crawford ...	Newcastle T'Lands.
		,,	C. Collyer ...	Stilazie's Kop.
		,,	W. Adendorff ...	Hope Farm.
		,,	N'castle Corporation	Newcastle T'Lands.
		,,	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		,,	J. W. Goodwill ...	Cornwall.
		,,	Messrs. Wade, Bros.	Macclesfield.
		,,	Harvey & Ketalbach	Lease 42
		,,	H. S. Dicks & Sons	The Retreat
		,,	A. Danks & Fox...	Crown Colliery.
		,,	A. Paine ...	Mount Prospect
		,,	F. W. Hatley ...	,,
		,,	E. Parker ...	,,
		,,	Unjopal & Eseresing	Newcastle.
		,,	A. H. Tatham ...	,,
		,,	Macdonald & Kemp	Lennoxton.
		,,	Natives ...	Whykombe.
		,,	,, ...	Droog Plaats.
		,,	A. Krause ...	Filexton.
		,,	G. W. Nourse ...	Rutti & Highton.
		,,	Simeon Ndhlovu	Freda.
		,,	S. W. Reynolds ...	Newcastle T'Lands.
		,,	O. Olver ...	,,
		,,	R. T. H. Harrison	Lennoxtown.
		,,	G. W. White ..	Ruth.
		,,	C. R. Savory ...	Pomeroy and Evin.
		,,	Loxton & Rudd	Waterfall.
		,,	Cooper & Chandley	Newcastle T'Lands
		,,	Blizzard & Pratt	Ingogo.
		,,	J. W A. Welsh ...	Paradise.
		,,	G. Star ...	Lennoxton.
		,,	G. Wood ...	Heron's Court.
		,,	W. L. Jee ...	Lennoxton.
		,,	A. F. Henderson...	Brazil.
		,,	Umquayo ...	Sweet Home.
		,,	D. Urquhart and Natives ...	Lau eston.
		,,	A. J. Crawford and Natives ...	Diamond.
		,,	Natives ...	Milton.
		,,	Lowrens and Van der Merwe ...	Buffalo River.
		,,	H. Fich ...	Northdown.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	H. Austin ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	Natives ...	Elizabeth Dale.
		,,	J. Masangu ...	Pernambuco.
		Scab	F. R. Tewson ...	Rooi Point.
		,,	G. J. Way ...	Vrede.
		,,	O Schwikkard ...	Boscabelli.
		,,	G. Star ...	Lennoxton.
		,,	R. S. Miller ...	Goloch.
		,,	C. G. Palmer ...	Dry Cut.
		,,	W. L. Jee ...	Lennoxton.
		,,	J. Davidson ...	,,
		,,	A. J. Debenham...	Knowsley.
			G. Wood ...	Heron's Court.
		,,	A. D. Uys ...	Horn River and Mooi Krantz.
		,,	F. Ferrier ...	Henley.
		,,	G. Jackson ...	Try Again.
		,,	W. Richards ...	Tweefontein.
		,,	W. E. Few ...	Erin & Imbezana.
		,,	Blizzard ...	Ingogo.
		,,	W. Short ...	Potter's Hill.
		,,	J. Matthews ...	Shakespeare.
		,,	G. Brown ...	Wykom.
		,,	T. L. Möller ...	River Bend.
A. S. Parkinson ...	New Hanover ...	Lungsickness	E. Boast ...	The Avenue, York.
A. Hair	Umgeni and Borough of Pietermaritzburg	,	J. Neden ...	Wilgefontein.
		,,	Aena & Latcham	Plessis Laager.
J. Chaplin ...	Klip River	,,	Discharged Transport Cattle	Matowan's Kop.
		,,	A. H. Spring ...	Reserve.
		,,	A. Armstrong ...	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ...	Grobblar's Kloof.
		,,	Natives ...	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,,	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	Pepworth & Reid	Reitfontein
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein
		,,	J. Peniston ...	Reserve
		,	W. M. Tollner ...	Weltervreden
		,,	J. Van Whye ...	Ladysmith T'Lands
		,,	G. J. Heslop ...	,,
		,,	H. E. K. Anderson	Gedula.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	G. F. & J. Woodhouse	Davel's Hoek.
		,,	Natives ...	Georgina.
		,,	,, ...	Zwaart Kloof.
		,,	G. J. McDuling .	Waterford.
		,,	Natives ...	Langverwatht.
		,,	,,	Vertrek.
		,	Nondo Gama ...	F. J. Dewaals' farm
		,,	A. Boers, & Native	Marais Vel.
		,,	W. Neizel, & Natives	Roosboom.
		,,	Natives ...	Doornkraal.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner	Farm.
J. Chaplin ...	Klip River ...	Lungsickness	E. Walker ...	Doornkloof.
		"	J. Umpbleby ...	Springfield.
		"	F. N. Nel ...	Catherine.
		"	Natives ...	Macpherson'a farm.
		"	P. Ruiter ...	Ladysmith.
		"	Mdhlondhlo ...	Blaaubank.
		"	Jobisa ...	Lombard's Kop.
		"	Nosubala ...	Weltervreden.
		"	H. E. K. Anderson and others ...	Dewdrop.
		Scab	J. H. Newton ...	Arnot Hill.
		"	G. Byloo. ...	Underberg.
		"	P. Nicholson ..	Walker's Hoek.
		"	C. O. C. & S. Carbutt	Matiaan's Kloof.
		"	R. D. Smith ...	Klip Poort.
		"	C. Thornhill ...	Eendt Glen.
		"	Tatham & Pascoe	Kivesfontein.
		"	E. F. Gibbons ...	Plaat Berg.
		"	G. Wetherill ...	Walker's Hoek.
		"	A. C. Beyers ...	Vaal Krantz.
		"	A. Krogman ...	Brakfontein.
		"	M. W. Krogman...	Dreifontein.
		"	P. Marais ...	"
		"	H. Boers ..	Dew Drop.
		"	G. Spearman ...	Feir View.
		"	J. Van Reenen ...	Wessel's Nek.
		"	A. Boers ...	Maras Vel.
		"	A. Carbutt & J. Good	Natiwaan's Hoek.
		"	Sparks Bros. ...	Ladysmith.
		"	J. de-Waal ...	Blaubank.
		"	F. J. de-Waal ..	Lombard's Kop.
		"	G. Innes ...	Eland's Laagte.
		"	J. Umpleby ...	Springfield.
		"	A. J. Taylor ...	Arnot Hill.
		"	R. Horsley ...	Warrock.
		"	Dr. Helps ...	Roosboom.
		"	Corrigel ...	Koolfontein.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	— Spence ...	Reunion Estate.
		"	H. F. Pearson ...	Everton.
		"	W. Caldwell ...	Stamford Hill.
		"	Natives ...	Union Location.
W. Freer ...	Upper Tugela ...	"	J. W. Coventry ..	Rangeworthy.
		"	W. Freer ...	Acton Homes.
		"	G. H. H. Coventry and Native	Rangeworthy.
		"	Borbasee ...	Vrom Draai.
		"	S. Sharratt ...	Klein Waterfall.
		"	Natives ...	Green Point.
		"	C. H. Williams, & Natives ...	Kroom Draai.
		"	A. H. Coventry ...	Earthcote.
		"	Mdhlenjana ...	Mooi Hoek.
		"	P.W. Dept. ...	Acton Homes.
		Scab	G. H. H. Coventry	Rangeworthy.
		"	J. M. Wales ...	Fairleigh.
G. Gielink ...	Zululand ...	Lungsickness	M. Titlestad ...	Ntingwe.
		"	Dinizulu ...	Hlabisa District.
		"	Noiwana ..	Nqutu.
		"	Natives' Cattle ...	Melmoth.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
G. Gielink ...	Zululand ...	Lungsickness	Sebambindoda and Natives ...	Kwamagwaza.
		,,	G. Havemann ...	Insuzi.
		,,	Military Loot Cattle	Warbeck, Elizabeth, and Barneveld, Melmoth.
		,,	Damusa ...	near Melmoth.
		,,	Ndabazeywana ...	Nqutu.
		,,	Strachan ...	,,
		,,	Jacob ..	Vant's Drift.
		,,	M Bube ...	,,
		,,	Surrendered Boers	Hlabisa.
		,,	Lafahla Usutu ...	Nqutu.
		,,	F. W. White ...	Melmoth.
		,,	J. G. Vanderwesthuyse	Ukandhla.
		,,	G. Muller ...	Near Melmoth.
		,,	C. Green ...	Inyoni.
		,,	J. Wantick ...	Eshowe.
		,,	Liversage & Van Rooyen ...	Umhlatuzi.
		,,	Surrendered Boers	Eshowe.
		,,	Mtantana ...	Telezi Ridge, Nqutu
		,,	Mhlamb ...	Sihlunegwana Hill.
		,,	Dr. Case ...	Eshowe.
		,,	Sub-Inspr Lewis, NP	Melmotq.
		,,	Surrendered Boers	Port Durnford.
		,,	H. T. James ...	Prospect.
		,,	J. Fry ...	Nkandhla.
		,,	M. Van Rooyen ...	Mahlabatini.
		,,	Res. Magistrate ...	,,
		,,	Sgt. Evans, N.P....	,,
		,,	P.W. Dept. ...	Eshowe.
		,,	F. A. Ortlepp ...	Saxony.
		Scab.	Surrendered Boers	J. R. Ortlepp's farm
A. Klingenberg ...	Umsinga ...	Lungsickness	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
		,,	Combrink Bros. ...	Uithoek.
		,,	Mrs. H. Strydom...	,,
		,,	Ngobazane ...	Vermaak's Kraal.
		,,	Usiquantjee ...	Emsita.
		,,	A. Müller ...	Pression and Buffalo Home.
		,,	M. Shebele ...	Freiburg.
		,,	Dr. J. Dalzell ...	Gordon Memorial M.S.
		,,	H. Steyn ...	Craigneathen.
		,,	H. Dedekind ...	Buffalo Home.
		,,	T. Keyter	Pomeroy Town Lands.
		,,	T. Crooks	
		,,	Botha	
		,,	Westbrook Bros.	
		,,	N. Smit ...	Tugela Ferry
A. J. Marshall ..	Dundee ...	,,	J. Benecke ...	Stone Hill.
		,,	Marshall Bros. ...	Cleveland.
		,,	— Haynes ...	Sterkstroom.
		,,	Military Authorities	Maypole.
		,,	Glutz ...	Rocky Glen.
		,,	Thorn ...	,,

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ...	Dundee ...	Lungsickness	Natives ...	Craigieburn.
		"	J. Landman ...	Boschfontein.
		"	J. Davidson ...	Beacon Hill.
		"	Natives	Long Land.
		"	" ...	Carolina.
		"	" ...	Renier.
		"	L. Hedder & May	Roadside.
		"	Natives ...	Kelvin.
		"	"	Uitsay.
		"	A. Jansen ...	Sheepridge.
		"	Natives ...	Navigation Colliery.
		"	A. Jansen ...	Sheepridge.
		Scab	J. H. Erkland ...	Carolina.
		"	F. J. deWaal ..	"
		"	J. H. Reis ...	Longfontein.
		"	— Dupreez ...	Jackalsfontein.
		"	D. Opperman ...	Gedull No. 2.
		"	M. J. Herbert ...	Vermaak's Kraal.
		"	H. J. Hearn ...	Hatting Spruit.
		"	Gouws Bros. ...	Kelvin & Kilburne.
		"	N. Glulz ...	Swiss Valley.
		"	W. Stafford ...	Sutherland.
W. A. Hutchinson	Alfred ...	"	Nqubu ...	Location.
		"	Ngihla ...	St. Mary's.
		"	Makubana ...	Amaci Location.
		"	A. C. Beyers & Sons	Doveton.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness Scab	Natives ...	Hungerspoort.
		"	G. Spearman ...	Woodlands.
		"	J. H. Beyers ...	Doveton.
		"	A. J. Harding ...	Zwart Kop.
E. Varty ...	Umvoti—Western Portion	"	J. M. & J. C. Van Rooyen ...	Pampoennek,
G. N. Perfect ...	Umvoti—Eastern Portion	"	Thos. Hill ...	Stolzenvels.
		"	Natives Cattle ...	Sobuza's Location.
F. E. Van Rooyen...	Kranzkop ...	Rinderpest Scab	L. J. Potgieter ...	Broedershoek.

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand. have been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
3rd July, 1901.

M. J. HIME,
for P. V. Surgeon.

Sugar Mill Returns.

IN Queensland certain of the central mills are under legislative compulsion to supply data for publication. "C.G.M," writing to the *Queenslander*, complains of the character of the information supplied, and concludes as follows :—The figures necessary to form a reliable comparison are very simple, and by no means difficult to summarise if ordinary mill records are kept uniformly. They are :—1. Total quantity of absolute sucrose in cane crushed. 2. Total quantity of obtainable sucrose in cane crushed. 3. Total quantity of sucrose obtained in bagged sugars and in estimated quantity in process of manufacture. 4. Quantity and quality of final molasses. If the methods of manufacture were also stated, a simple

and reliable guide would be supplied for the benefit of central mill people generally, and the managers in particular, who would then be enabled to watch for any improvement, when a short correspondence, or an occasional visit, would keep up a continual interchange of ideas. Discussion and criticism of sugar making problems would do a lot of good at the present time, but unfortunately in matters pertaining to sugar manufacture there seems to be a "conspiracy of silence," presumably because it is rather unpleasant to admit that notwithstanding all our boasted knowledge, "good mill work" seldom exceeds 80 per cent. of the sucrose contained in the cane; consequently the "unavoidable" (?) losses have been generally ignored in the records of mill work, both private and central. The inheritance of defective and imperfect methods from the passing generation ought not to deter us from endeavouring to make much of the present day loss "avoidable."

Gardening Notes.

By W. J. Bell, Florist and Seedsman.

KITCHEN GARDEN.—Peas may be sown this month. The best varieties are:—

Pride of the Market, 2 feet.
Harrison's Glory, 2½ feet.
Yorkshire Hero, 2½ feet.
Doctor McLean, 3 feet.

Sow in drills 2 inches deep, not less than 3 feet apart, about 1lb. to 40 feet of drill. Peas grow best in a soil which has been liberally manured for a previous crop. Unless the soil is very rich, a dressing with phosphatic manure, when the pods begin to swell, will give excellent results.

Further sowings may be made of carrot, beet, lettuce, radish, and turnip. Early tomatoes, marrows, and cucumbers can be raised by sowing the seeds, about the middle of the month, on a hot bed under a frame. Without the assistance of bottom heat it will be of little use sowing these till towards the end of August, or beginning of September.

Flower Garden.—Sow pansy and other hardy annuals and perennials.

Prune and manure roses and deciduous flowering shrubs.

This month is the best time for planting roses. The following is a good selection:—Lamarque, white; the Bride, white, occasionally flushed with carmine; Bouquet d'Or, coppery yellow; Duke of Edinboro and Ella Gordon, crimson; La France, silvery rose; Belle de Bordeaux, pink; Climbing Perle des Jardins; Etoile de Lyon and Marechal Niel, yellow; Madam Lambard, bright metallic red Marie Van Houtte, canary yellow, edged with rosy carmine; Madam Pierre Cochet, deep nankeen or orange yellow; Francis Dubreuil, crimson, a fine button-hole rose; Madame la Baronne Berge, rosy white edged cerise, similar to Homer; Beauty of Waltham, bright rosy crimson; Captain Christy, salmon; Souvenir de la Malmaison, flesh colour; Souvenir de William Wood, maroon; Marechal Vaillant, purplish red.

Deciduous shrubs should also be planted for spring and early summer flowering, such as Philadelphus, Dentzia, Spiræa Reevesi (double May), Viburnum opulus or Guelder rose, magnolia purpurea, Pride of India, hibiscus grandiflora, hibiscus syriacus, the double flowering pomegranate, lemon scented verbena, &c.

Deciduous fruit trees, such as apples, pears, peaches, apricots, nectarines, plums, quinces, figs; also, grape vines, raspberries, and American blackberries should now be planted.

Where only a limited number of fruit trees is required, the following will be a good selection:—

Apples, Cooking.—Beauty of Kent, Echlinville Pippin, Lord Derby, Lord Suffield and Keswick Codlin.

Kitchen and Dessert.—King of Tomkins County, Reinetta de Canada, Rhode Island Greening.

Apples, Dessert.—Cox's Orange Pippin, Golden Reinette, Irish Peach, Newtown Pippin, Nonpareil, and Ruby.

Pears. — Louise Bonne of Jersey, Williams Bon Chretien, Chaumontelle, and Beurré Diel.

Peaches.—Early Amsden, Early Rivers, Doctor Hogg, Royal George, Van Velden's.

Apricots.—Moor Park and Royal.

Nectarines.—Early Hardwick, Large Elruge, Red Roman, and White.

Plums, for the Midlands and Up-country Districts. — Botan, Burbank, Chabot, Kelsey, Satsuma, and Early Red and Early White Mirabelle.

The following are suitable only for the colder districts of the Colony :—Orleans, Magnum Bonum, Green Gage, and Purple Gage.

Manna or Millet Seed.

BELOW, says "Agricola," in his farm column for the *Witness*, is a letter from Mr. Koe, of Estcourt. I saw his advertisement in the *Witness*, and sent for some seed to give it a trial next spring. From Mr. Koe's letter, it seems to take about the same time as oats to ripen, and the cultivation would be about the same. I see in the last issue of the *Agricultural Journal* a note on this subject giving the name of this crop as Johnson grass, or Sorghum Halepense. I am doubtful if this is so, as the description given does not seem to tally with our ideas of an annual, which, I believe, millet or manna is. Can anyone give me for certain the botanical name of the millet which is grown in the Transvaal?

Kombolton, Estcourt.
14th June, 1901.

Dear "Agricola,"— In your "Country Notes" of to-day's issue I see that you quote my letter to the *Journal*, and refer to the difficulty of procuring good "manna" seed. As you will see in another column of the *Natal Witness*, Hutchinson & Koe can supply the seed, and will guarantee germination. I planted this year on the 11th of January, as I wanted to thresh most of it for seed. For fodder growing I should recommend planting towards the end of January, to be fit to cut when the rains are over. I am speaking of this part of the country.—Yours, &c.,

ARTHUR P. KOE.

[It is perhaps advisable to point out that "Agricola" makes a slip of the pen when saying that the *Agricultural Journal* gives the name of Johnson grass to the manna of South Africa. The *Journal* carefully avoided committing itself to expressing any opinion. The words were :—"In connection with the subject of millet-growing, the following, which is extracted from the seed catalogue of Messrs. Anderson, Sydney, may prove interesting," etc. Enquiries go to show that in the neighbourhood of Maritzburg, and probably in other parts of the Colony, manna has been grown in small quantities for a long time, for thirty years or longer. Attempts from time to time to sell it on the Maritzburg Market always proved useless. The growers recognised the value of the fodder, but the public resolutely held off. Manna now fetches 7s. per 100lbs. on the Maritzburg Market, and there seems at present to be a good chance of it becoming established in the Colony as a recognised fodder.]

A new lemon is called the American Wonder, by some it is termed the Ponderosa. It commences to bear enormous fruits when only two years old, and these average from 1½lb. to 3lb. each. The flavour of the ripe lemons is delicious, being very full of rich juice. It grows rapidly, is easily propagated, and is said to grow anywhere. Excellent for all culinary purposes.

The *National Provisioner* states that during the year ending March 1st, 1900, the Western factories produced 794,000,000lb. of lard from hogs yielding 2,898,000,000lb. of green pork. They paid for these hogs in cash the sum of £23,000,000. The total number of hogs packed during the year was 22,200,821, against 23,651,695 the year before. Their live weight was 5,175,253,000lb. They made 3,692,595,000lb. of meats and lards. To this must be added the amount killed at St. Joseph and other Western packing points, and the hogs killed by farmers and country butchers, of which no record is kept.

Coast Fruit.

THE BAMBOO AND ITS USES.

INTERVIEW WITH MR. H. W. JAMES.

By "ERGATES."

MR. Henry W. James is one of the most successful fruit growers on the Coast. He has an enthusiastic belief in the industry, and the more prosperous growers he could see, the better he would be pleased. Mr. James came to Natal in 1860. His reminiscences of the early days in the Colony, and of the old colonists are immensely interesting and diverting, but unfortunately the relating of them does not come within my scope. From 1863 to 1894 he was the Government Superintendent of roads for Victoria County. In 1864 he bought his farm—"Zwolle"—one of the Bryne grants, and about four miles from Verulam. While in the Government service his farm was managed by a brother-in-law. Mr. James' experiments at first were not happy. He started with fifty acres of coffee, and after having one very good crop there came a succession of very dry seasons and no crops, and then came the "borer," and a few years later, to cap all, the "leaf disease" made its appearance. Mr. James believes that the climate of Natal is too dry, and that the altitude of the Coast land is not sufficient for coffee growing. At present he keeps only enough trees to provide the wants of his own house. Cotton was then tried, about 60 acres being put in. It did well, and as the price, owing to the American secession war, was high, the prospects were encouraging. Then came labour difficulties. About sixty people for picking were absolutely necessary, but on the opening of the Diamond Fields the labour—Basutos at 7s. per month—disappeared. Then sugar was tried, the Umhloti Central Mill having been built, but the results were unsatisfactory.

NAARTJES AND MANDARINS.

"Meanwhile," to use Mr. James' own words, "I had planted a couple of hundred naartje and mandarin trees, and every succeeding year I planted more, including mangoes and other fruit trees. I was then, and am now, even more impressed with the wisdom of Sir Walter Scott's character who said, 'And, Jock, when you have naething to do be aye pittin' in a tree; it will be growin' while you're sleepin'!' I first saw money in fruit when I realised £90 from the crop of the little patch of the 200 trees I first put in.

THE SOIL.

The soil of the hillsides on which were planted the orchards I noticed was a rich chocolate in colour, loamy in texture, and generally about two or three feet thick, the substratum being friable shale. The soil, Mr. James informed me, suited all the citrus family splendidly.

RAISING YOUNG TREES.

"I raise," said Mr. James, "from seed. It is not uncommon, however, in Natal to gratt on the lemon. Why they do this I don't know. According to my experience, and from what I have seen, naartje trees from lemon stocks do not become half the size of those raised from seed, and they give very poor crops; as I have heard men say, 'you can put the crop of a tree into your hat!' Some five years ago I wrote to the Director of Kew Gardens for information on the subject. He said he had no personal knowledge, but he referred me to one who was held to be the highest authority on the question. I wrote, and this eminent authority replied, 'Graft on lemon stocks.' We English are terrible at running in grooves. The naartje grown from lemon stocks I admit is bigger and finer looking, but then it is comparatively tasteless, and, worst of all from the grower's point of view, the crop is only a fourth of that from a seedling tree. I hold from experience and observation that the lemon

stock is wrong in all ways ; the lemon is the most delicate of the citrus tribe, it is short lived, and is the most subject to disease. I read somewhere lately that in California the naartje is being experimentally grafted on orange and other stocks."

Nursery Work.

"And now for some detailed information about the raising from seed."

"Firstly the seeds must not be dried ; they may be kept in damp earth. Over every seed bed I put a rough frame work about 18 inches high, and across the frame work are mealie stalks. This arrangement keeps off the sun. Gradually the mealie stalks are removed, and when the seedlings are ready for planting out in the nursery all the stalks have been removed, and consequently the young plants are prepared for standing the full rays of the sun. Late autumn is the proper time for planting. The nursery should be well manured—I use chiefly kraal manure—and the plants should be two by three feet apart. I keep my young plants never less than two years before I sell them or plant them out, and even three years sometimes. Those who plant them out when yearlings always lose many. When removed for planting out, of course, there should be ample cutting back to compensate for the incidental injury to the roots. I like planting big trees, and am inclined to let the plants remain in the nursery three years. In the nursery, you see, it is so much easier to watch the young plants and give them the necessary attention in protecting them from insects, caterpillars, grasshoppers, and blight. For the last I use paraffin emulsion. I refuse to sell year old trees, because yearlings are not satisfactory ; it is much better to start orchards with strong young trees. Formerly I used to send out young trees in bundles, with the roots wrapped up in sacking. I now send them out, and so should all others doing the same business, in cases, and the roots in soil. The trees will keep for a week or more if watered and kept in the shade. About the fourth year after planting out, the trees begin to bear, and thence forward they give good crops. Plant twenty feet part, preferably on the quincunx system. In planting be careful that the little tree is not put down lower than it was in its nursery bed. The 'mark' on the stem will make this important point simple. Also be most careful that the stem and roots receive no injury. The holes in which to plant them should be about two feet across, and the soil for putting round the roots and filling up the hole should be gathered to the depth of a couple of inches from around. No manure should be put in the holes. Be careful when the tree is planted that there is no depression ; if there is, water will be lodged, and the roots of the tree will rot. For planting out wet weather is best. I always select such weather, and when the work is done I give the hands a little of something which will stave off bad results from the wetting. The orchard, for such the land becomes when the young trees have been planted out, should be continuously cultivated. Ploughing should be kept up—very shallow—as long as possible. On slanting land, such as the most of mine, a turn-over or hillside plough is best. When ploughing becomes risky to the surface roots, then cut away harrows and weeders may be used. Hand hoeing is also necessary ; the hoers must be most careful not to injure the stems of the trees. Between the rows two or three lines of mealies may be planted ; sweet potatoes are also a capital crop for the orchard. Give these or other catch crops plenty of manure—what I have chiefly used is stable and kraal—and lots of cultivation.

Mangoes.

"The mango tree cannot be regarded as a reliable cropper. The bad years are too frequent, and when the year is favourable there is a glut. From the third year they bear. They are free from disease and easily managed. Indians are going in largely for them. The fruit does not bear transport well. I prefer as a grower the common mango, and it is the most suitable for chutneys and preserves. The Bombay kind is the best but it requires very careful handling.

Bananas.

"Bananas don't do well with me ; they require a good but sandy soil, which I have not got, wet seasons, and proximity to the sea is desirable.

Mandarins.

"Mandarins — I am keeping to our popular names of naartjes and mandarins —are cultivated in just the same way as the naartje. The mandarin, which is a stronger and handsomer tree, is less liable to disease, and bears about the same quantity of fruit. In ripening it follows on the naartje.

Depredators.

"No, I don't trouble about the injury done by the birds. I like to see them about, and I believe in what is called the balance of nature. They kill off hosts of insects—the chief enemies of the orchard—and in recompense they are, for my part, welcome to their fill of fruit."

While riding round the farm Mr. James pointed out some sugar cane bitten through and sucked by monkeys. Here again his views were marked by calm philosophy. In reply to my question as to the desirability of destroying these depredators, he said that to get rid of them he would have to cut down the patch of natural forest remaining on a neighbouring krantz, and he held that the beauty of that little bit of primeval nature more than balanced the loss of a little sugar cane. This sugar cane was growing on flat, low lying land, not suitable for citrus trees. The cane is sent for crushing to the neighbouring central mill. The depredations of the Indian field hands were, however, a different matter. All hands, he explained, were allowed to eat as much fruit as they liked, but the mischief was that they would steal it for sale. It was not an infrequent thing to find fruit secreted in lots along the farm road leading to the Verulam railway station, and these caches of fruit were put on his own wagons for conveyance to Verulam, and there disposed of. The audacity of the whole business evoked from Mr. James appropriate indignation. He has now engaged a native police constable, and is much satisfied with the man's services.

The Bamboo and its Uses.

Small copses of bamboo form one of the most striking features of the farm, or estate, to use the more common Coast designation. The bamboo serves many purposes. Primarily as a shelter to the fruit crops from wind it is of great value. Then it has very material and direct uses, and on this account Mr. James urges general cultivation throughout the Colony. On the Coast the growth, of course, is more luxuriant than can be expected in the upper and colder parts of the Colony, but as there are immense varieties—many excellent kinds growing in parts of Japan and China, where the winters are of intense severity—he believes that even for the coldest parts of South Africa suitable varieties might be found. When he first planted a few clumps some twenty years ago, he did so with two objects in view; firstly, to give shelter, and secondly, for selling to Indians as poles for their house construction. A ready sale for the poles is found from 3d. to 1s. each. The top height of his bamboos is about 70 feet, but there are kinds which reach in India 120 feet, the diameter at the base being one foot, and from sections of this thick part the Indians make barrels for oil.

Boxes.

The bamboo fruit box often seen in Durban, and sometimes in Maritzburg and beyond, was, so to say, invented by Mr. James. He now has imitators, and he would be glad to see more. The boxes are of great strength, and for permitting the free circulation of air among the fruit they are perfect. The only sawn wood required is for the ends. The ends for the small boxes –weighing with contents about 100 lbs.—are solid, while for larger boxes the ends are square frames, and are filled in with small bamboo slats. and are filled in with small bamboo slabs. These boxes can be made of any size, and as they cost less than half what boxes cost made of ceiling boards, they would serve admirably for sending certain kinds of farm or garden produce from a distance to market. The manufacture is simple, and moreover it is easily learnt by Indians or by intelligent natives. The poles, which

are taken from plants at least ten years old, are first allowed to dry. They are sawn to the required length, rather a small tooth hand saw being used. The lengths are then split ; a bamboo of four inches diameter gives about five slats. For this work the man I saw at work was using a plough coulter, which had had the upper end shaped into a handle by the village blacksmith. The triming follows. This was done by an Indian, squatting on his haunches. His tools were a side axe and a bush knife. The latter was the implement most used, and the rate at which he trimmed the lengths was astonishing. The nailing of the boxes together was done with a sort of automatic ease and regularity. Mr. James has always in training several of the hands, so as to avoid ever being in a fix for want of capable workers. Here are the prices :—

Cost of a Bamboo Box.

	d.
Two sawn timber ends	6
Hoop iron	1
Wire nails	1½
Labour and bamboo	6½
	1s. 3d.

Such is the cost of a bamboo box 2ft. 2in. by 1ft. 6in., and 9in. deep, which, filled with citrus fruit, weighs almost exactly 100 lbs. The increase of cost for bigger cases is comparatively small owing to the fact that the timber required for the ends is not solid, but, as explained, is made into a square frame. Mr. James is convinced that a factory for the making of these boxes and other articles from bamboo would do a profitable business. The difficulty lies in the want of bamboo. It is not commonly enough grown to justify the manufacture being undertaken as an independent business. Ten years would have to go by before purposely planted bamboos on a large scale would be fit for manufacture.

Other Bamboo Construction.

The bamboo is impressed into many more services by Mr. James. The walls and doors of his sheds and stable are bamboo, the ladders for gathering fruit are bamboo, the water troughs for the poultry are bamboo, and even the handles for hammers and the kitchen kafir's axe are of bamboo. Most Colonists know how soon the handle of the last-named implement comes to grief, and when they learn that a bamboo handle successfully resists the bad treatment it gets from average kitchen boys, they will realise how tough must be the fibre of the bamboo. In some parts of the shed walls I noticed the "borer" was busy, while other sections were untouched. Mr. James is of opinion that if the bamboo is cut at a certain time of the year the "borer" makes no entrance, but what that time is he has not yet concerned himself to determine.

Propagation.

"Some people," said Mr. James, "find the propagation of the bamboo difficult. I cannot say I have found any difficulty. It should be planted out as sugar cane, the holes being a little deeper, and about 30 feet apart. The lengths planted should be about four or five feet, and great care should be taken not to injure the shoots. In damp, rich soil they grow big and strong, and on dry, poor soil, thinner and harder. Very poor, dry soil gives the best whip sticks."

Final.

"And now, Mr. James, to sum up, tell me about the profits and prospects of the citrus fruit industry."

"A planter may safely, in my opinion, look forward to getting a yearly return of from £20 to £25 per acre. In calculating the expenditure the value of the catch crops grown between the trees, of mealies, sweet potatoes, beans, etc., must not be forgotten, for they go a long distance in bringing it down. Of course a good deal of work thinking and organising are required, and certainly no man who is 'born tired' should go in for the business. And about the prospects, I think they are capital. Johannesburg will take all we can supply for years to come, and then there will be the unlimited demand of England."

The Bamboo.

SHELTER from winds, and plenty of moisture, with good soil, are needed for these plants. There are tropical bamboos, which could not be expected to thrive here; but there are numerous kinds which are thoroughly hardy. The magnificent bamboos to be seen in Brisbane, and on a smaller scale about Sydney, will some of them do well enough here also. The names of a few of the best hardy bamboos may be of benefit to our readers. Thamnocalamus Falconeri is very fine. Phyllostachys Quilioi is a very strong grower, making canes in a very short time 20ft. to 30ft. in height ; it requires plenty of moisture. P. viridi-glaucescens is one of the very finest bamboos. P. aurea, P. nigra, P. mitis, P. palmata, P. sulphurea, and P. coryana are all worth having. Bambusa fastuosa is highly ornamental. The Arundinarias contain some very useful bamboos. A nceps grows in its native country to a height of 30ft. ; it has charmingly luxuriant foliage, of a vivid green colour ; it spreads rapidly. Other tall growers are A. nitida, A. Simoni, and A. japonica. Dwarf Arundinarias are Fortunei and auricoma. A good bamboo garden in Victoria would be unique. Some of the kinds enumerated are already in the colony ; the others could easily be imported by some of our nurserymen.

In English gardens the hardy bamboos have become quite established, and some 50 kinds are in cultivation. No hardy evergreen is so graceful and beautiful as the bamboo. No class of plants contrasts so well with ordinary foliage plants as it does. Many of the species are not only beautiful to look upon, but are most useful as well. Splendid sticks or stakes for tying plants to can be cut from some of them, to say nothing of walking-sticks, fishing-rods, riding whips, etc.

The leaves of some of the bamboos make a good thatch for buildings. The young blanched shoots are cooked and eaten, and the seeds are collected and used for making bread; they are also fermented and made into a drink resembling beer. A whole page may be written on the various uses to which the bamboo may be put. Bamboos are simply grasses of a tall-growing nature, the stems and branches of which have become hard and woody. Some of the species are perhaps the fastest-growing plants in the vegetable kingdom. Bambusa Tulda has been known to grow 70 feet in a month. Fortune noticed the growth of some Chinese bamboos to be two to two and a half feet per day.

To successfully transplant bamboos, unless they be grown in pots, they should only be removed in late spring, say between the commencement of November and Christmas, and especially at this period, when the weather is wet. If there are rocks or stones in the soil they are to be planted in, they should by all means be retained, as the rhizomes of the bamboos grow round and about them, and they also tend to prevent rapid evaporation of moisture.—"Australasian."

Stock Imported by Sea During May.

THE following stock was imported into Durban by sea during the month of May :—Cattle, 161 ; horses, 7 ; mules, 8 ; goats, 2 ; dogs, 11 ; antelope, 1.

The aeration of milk is coming to be one of thees sentials of good dairying. In many parts of the world it seems to have been demonstrated that milk properly aerated will give a better-flavoured butter product than milk not so aerated. In Europe and in the most progressive dairy sections of this country the practice has become popular. Recently a creamery board of trade passed a resolution to the effect that their creameries should in the future pay 5 cents. per 100lb. more for milk aerated than unaerated, But while aeration is advisable, it must be done in the proper place and under proper conditions. The place for aeration must be in the pure air, and where there are no odours that will get into and injure the milk.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write :—There is every indication of a revival in trade. Although it may not be so marked as many would wish, nevertheless, taking matters all round, signs are far more healthy than they have been for some time past. Rain has fallen all over the Colony since our last report.

Mealies.—Large quantities have come forward during the past fortnight, and considerable quantities have found their way into the Transvaal. Prices on the market have varied between 10s. 4d. and 11s. 9d. per muid, including sack. A good few have changed hands privately at 11s 6d. per muid.

Forage.—Very scarce.

Hay.—Good samples are still obtainable at prices fluctuating between 2s. 1d. and 3s. 4d. per 100lbs.; bedding from 3s. 6d. to 22s. 6d. per load.

Potatoes.—Far from plentiful, and prices have ruled, for good eating potatoes, from 11s. to 17s. 9d. per 100lbs.; sweet potatoes, from 2s. to 5s. 3d. per sack.

Mabele.—Large quantities offered daily, and prices have fallen. The market has varied between 5s. 9d. and 7s. 6d. per 100lbs.

Buckwheat.—Very little offering; 11s. 6d. per 100lbs. being the average price realised.

Beans.—From 9s. to 16s. 9d. per 100lbs.

Onions.—More plentiful, but good samples have ruled high. Prices have ruled between 16s. 8d. and 33s. 4d. per 100lbs.

Pumpkins.—From 4s. 9d. to 7s. 6d. per dozen.

Eggs.—Whilst some samples have been as low as 1s. 10d. per dozen, others have realised 3s. 1d. per dozen.

Butter.—A fair quantity offered daily, and prices have varied between 1s. 1d and 2s. 9d. per lb.

Poultry.—Common fowls from 1s. 11d. to 4s. 6d. each; turkeys (cocks) 15s. 6d. to 19s. each, (hens) 6s. to 10s. each; ducks, from 5s. 6d. to 12s. 3d.

Sundries.—Mutton from 3d. to 9d. per lb.; pork, from 3½d. to 9d. per lb.; beef, from 3½d. to 4d. per lb.; sausages, from 5d. to 8d. per lb.

Vegetables.—Market has been well supplied of late with beans, beetroot, cabbages, carrots, cauliflowers, onions, peas, potatoes, pumpkins, turnips, and tomatoes.

Fruit.—The varieties disposed of consist of apples, bananas, limes, lemons, naartjes, oranges, papaws, and pineapples.

Wood.—The lowest price realised for wood was 7d. per 100lbs., the highest 11½d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44. writes :—

General.—Business is dull again, and stocks are accumulating and movements small.

Mealies.—The market is fairly firm, and small parcels are daily being required for Johannesburg. About 11s. per muid represents the average price paid to farmers locally, and supplies are quite equal to demand.

Potatoes.—Big prices continue to be paid for the colonial article in spite of the far lower rates for the Australian, which for table purposes is superior in every way. Twenty-three shillings per bag is daily paid on the morning market, while best qualities of Australian are offered at 17s. 6d.

Hay.—This is in great demand for the Transvaal, and few parcels are on offer. Fifty shillings per ton is readily paid, and quotations may be expected to advance.

Mabele.—Is in good supply with limited demand. Buyers offer from 14s. to 15s. per muid.

Luck being the topic of conversation when a few of us chanced to meet recently, an old negro who was present remarked—"I'se always had good luck with potatoes dat were well hoed." It seems to me (says an American) the old man hit the snail squarely on the head. It is elbow grease that is more often than not the secret of "good luck" with crops.

Procrastination has been called the thief of time, but bad roads is the highway robber that takes the farmer's time, mistreats his horse, destroys his waggon, isolates his family, takes toll on all that he buys, and all that he takes to market; keeps the family from church and public gatherings, where their information might be increased, their ideas and aspirations broadened, and their lives brightened. He sours the tempers, he drives the children of promise to the already congested channels of city life. By his presence he repels alike the advances of the settler, the tourist, and the manufacturer; he is the unqualified enemy to wealth and progress in every form.—*Florida Agriculturist.*

The Agricultural Journal

AND MINING RECORD.

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CONTENTS.

Rinderpest.

By H. WATKINS-PITCHFORD, F.R.C.V.S.

A FURTHER bulletin announcing continued freedom from any extension of the Umvoti Valley outbreak of rinderpest will be welcome to all. Such knowledge, though highly satisfactory, must not be allowed to lure us into a sense of false security, for it should be recognised fully, after the experience of the past, that in all that concerns rinderpest we are dealing with a subtle and insidious disease, which demands the greatest alertness of attitude.

For this reason no precautions have been relaxed as yet, and it is only with the security assured by time that the Department will feel free to relax its vigilance.

As has been suggested, the position taken by a section of the farming population towards the recent action of the Government in this matter, has been based upon a misconception of the facts of the case. No undue delay occurred in killing all animals afflicted with the disease or capable of carrying it, but it will be acknowledged that a certain period of necessary delay occurred between the first discovery of the disease and the moment at which authorised action could take place.

A reception anything but cordial is likely to be extended to the unauthorised individual who, hearing of a case of sickness in a Kafir location, arms himself with a rifle and goes forth promiscuously "gunning." It is satisfactory, however, to observe that a fuller understanding of the action of the Government has met with the approval of the farmers generally, and the same action, probably, will be taken by the Department should the disease unhappily manifest itself in other parts of the Colony. In this way it is hoped that the much-vexed question as to the best method for general adoption of fighting the disease will not arise.

There can, however, be no doubt that the system of bile inoculation as originally advocated by Professor Koch will be adopted only with hesitation; the subsequent modifications, however, furnish us with an efficient weapon under certain conditions for the check of the disease. The original directions, as issued by Professor Koch, from Kimberley, in February of 1897, were to the effect that bile should be taken on the "sixth day of the fever," and that "one hypodermic injection was sufficient." It was upon these instructions, as given by Proffessor Koch himself to the representatives of the Natal Veterinary Surgeons who visited him in March, 1897, that the process was applied throughout Natal. That it was found wanting in some respects, and gave way subsequently on becoming subject to the modifications of experience, is, of course, a matter of history.

Paspalum Dilatatum.

A SMALL parcel of Paspalum Dilatatum grass has arrived, and is available for distribution in small quantities without charge to applicants who may wish to give it a trial.

It will be remembered that this is the grass of which the Hon. F. R. Moor spoke so highly in the first of his communications to the *Journal*, after his return from Australia. He said:—"All my enquiries and all my personal observations go to show that paspalum will be one of the best grasses for Natal farmers to try." With regard to the planting, he said: "The most successful method is that of laying out small plots, and by dividing or separating the roots, transplanting therefrom. The planting is done in rows three feet apart, and the plants two feet apart, or preferably, in the opinion of some, three feet apart." We have published a great deal with reference to this grass, and those who may wish to refresh their memories on the subject, more particularly with regard to some difficult process of the propagation, will do well to refer to the following Numbers of Volume IV: 1, 2, 4, and 5.

The following item of news testifies to the established popularity of the grass, and to the apparent opening that there may be for nurserymen and others to cultivate the grass for selling as plants.

"At a recent meeting of the Agricultural Central Bureau, South Australia, the Minister of Agriculture called attention to a letter from the Mayor of Adelaide in reference to this grass, in which it was suggested that the department should purchase 100,000 plants for distribution throughout the State; also that a report on the grass should be obtained from the adjoining States.

"The Secretary said there was no necessity to ask for reports as to the value of the grass, as it had been proved to be very valuable in suitable soils and localities. To distribute it throughout the State as suggested would be waste of money, as the grass must have a fair amount of moisture in the soil during the summer or it will not thrive. Apart from this the grass was advertised by many seedsmen in the adjacent States at reasonable prices, and it was against the principles of the Bureau to distribute plants of proved character and readily obtainable from the seedsmen.

"Members agreed, and it was decided that it was unnecessary to interfere in private enterprise in this matter."

Noxious Weeds.

IN response to a request from the Hon. Minister of Agriculture, suggested by the Hon. R. Jameson, M.L.C., Mr. J. Medley Wood, Curator Botanic Gardens, Durban, has arranged to have a certain number of drawings of noxious plants, and descriptions thereof, printed for the purpose of distributing among Magistrates and Road Overseers. It is hoped that this action may lead to a better knowledge of the noxious weeds of the Colony—more especially of the "burr" class—and, as a result, to their extermination.

The Year's Rainfall.

A CURSORY glance at the meteorological tables will show that although the rainfall for the last year ending June 30th is heavier than that for the preceding year, yet it has been far from exceptionally heavy. In two instances only is 50 inches reached. Up-country stations show returns some 20 inches lower. Happily the most of the rain fell opportunely for the crops generally. Mr. A. Wilkinson, Ottawa, writes that his average for twelve years has been 40·19 inches, and consequently the concluding year shows 1·60 inches above that average. He adds:—"With an annual average of 40 inches sugar will pay in Natal. For Cuba the average is 50 inches, and for Mauritius 70 inches" Mr Charles Green, Gourton, Ixopo, where the year's rainfall amounts to only 13·40 inches, writes, "the spruits have ceased running, and no crops will be reaped in the Umhlanvena Valley." Several correspondents refer to the slight earthquake which occurred on the 10th June.

Irrigation.

COLONEL CORBETT, the Irrigation Expert, will complete his term of two years' service with the Natal Government about the middle of November. Anyone wishing to consult him should therefore apply without delay. No fee is charged for this officer's services. Application should be made direct to Colonel Corbett, Department of Agriculture, Pietermaritzburg.

District Reports.

IXOPO, 15th July.—During the past fortnight the weather has been dry, dusty and windy. The annual show was held here on the 3rd instant. The entries were not as numerous as usual, owing, probably, to the excessive dry weather. There has been a severe epidemic of influenza, and, I regret to state, other afflictions, with fatal results. Natives seem to possess plenty of money, and prefer going to "beer-drinkings" instead of turning out to work.

FRANK E. FOXON, Magistrate.

NEW HANOVER, 15th July.—The District is not quite clear of lungsickness yet, Mr. Boast's farm still being under quarantine. There is nothing else worth relating.

A. RITTER, Magistrate.

NKANDHLA, 30th June.—Little rain has fallen during the month, but the weather has been very cold. I am pleased to say the harvest appears to be a fairly good one. Mealies are being purchased freely by the local storekeepers

from the natives, and I am told there was a very heavy "Amabele" crop in the Mfongosi valley. No locusts have been reported. Several horses have died in this neighbourhood from poverty, the veld being very bad just now. I am glad to say that lungsickness is not increasing, and so far no local cattle have broken out. The infected herds at present are Col. Bottomley's loot cattle at Mfongosi, Messrs. Harvemann's surrendered burghers' at Insuzi, J. Fry, Emandhleni, and the remount cattle in the Insuzi valley. There have been no cases amongst the military transport oxen for over a month. I regret to say that several horses and goats were raided by the Boers from the natives, and things are still very unsettled along the border. The health of the District has been bad, colds, bronchitis and fever having been very prevalent.

C. C. FOXON, Magistrate.

NQUTU, 2nd July.—For a winter month the past has been, taken throughout, exceptionally mild; cold and warm weather have alternated, and a fair quantity of rain has fallen. All crops have been harvested, and have, on the whole, given good results. Lungsickness is still rife about the District, though it has not spread to any extent beyond the already infected herds—only one fresh outbreak having been reported during the month. Grazing throughout the District is very poor, yet, notwithstanding this, stock are in very fair condition.

C. HIGNETT, Magistrate.

UBOMBO, 3rd July.—Colder weather than usual was experienced during the past month. The minimum temperature was 44 degrees, and 73½ degrees the maximum. Nevertheless, a rainfall of 2·07½ inches was registered, and a pretty severe, and very unusual thunderstorm, for the time of year, occurred. Four head of cattle died in the vicinity of the Magistracy from gallsickness. It was thought the inclement weather and consequent richness of pasture accounted for the malady. The herd, accordingly, was moved to a fresh and more elevated grazing-ground, with what result awaits to be seen. On the 15th, an enormous swarm of locusts passed over the mountain, from south-east, north and north eastward. No damage was done, the crops all being harvested, save pumpkins, ground nuts, and native potatoes.

A. R. R. TURNBULL, Magistrate.

Milk and Cream Producers and their Responsibilities.

BY GEO. R. RICHARDS.

IN an article which recently appeared in the *Australian Farm and Home*, by Mr. N. G. Somerville, the writer pointed out with much emphasis and much truth that the weak link in the dairying industry was to be found, not in the creameries, but in the suppliers themselves of the raw material. This may come as a matter of surprise, particularly to some of our Natal farmers, whose methods and productions have, to themselves, hitherto appeared almost perfect. But as one who has had some little experience during the past two years of these "productions," I would say that what has been written of the Australian farmer applies with equal truth to a great number of their Natal brothers.

As Mr. Somerville says, the dairy industry is a wonderful one, and every farmer should be deeply interested in it, for the success of it really depends upon him. Science, invention, capital, and enterprise have done all, and are still doing all they can, and we have arrived at a point where the future fate of the dairy industry in Natal is in the greatest peril. Competition from every side, and the rapid development of the industry in other countries, all point to an increased supply of dairy food in one form or another. This great progress applies chiefly to the dairy product after it leaves the farm, but even the farmers of those countries are awakening to the necessity of not only producing their milk at the lowest possible cost, but also of seeing that the article when handed to the central factory is in its best condition.

If our Natal farmers would only grasp the full meaning of these two principles, and act on them, we should have very little grumbling as to the prices they were receiving from the Creameries, and as to the quality of the articles produced from their supplies.

Unfortunately it is the rule, and not the exception, for delicate dairy produce to be treated on the farms as though it were so much hay or mealies, or other

rough production. Little or no attention is paid to the cleansing of the cows' udders or Native milkers before the operation of milking commences. The washing of the milk buckets and cans is of the most perfunctory character, and the carriage of the milk in open carts through the broiling sun to the Creamery is expected to have no bad effect whatever. And, finally, when the milk is condemned at the factory as unfit for use, or only suitable for separating, Oh! what harmony fills the air. And yet no one is to blame but the man who shouts his grievances in your ear.

If you talk to him about aeration he tells you that he kept cows, and supplied the City and elsewhere with the finest quality of butter before you were born, and doesn't see what good an aerator can do. If you suggest mildly that perhaps his can might not have been sufficiently sterilized before the milk was poured into them, he evinces the greatest indignation. If you enquire cautiously and carefully into the manner and style of his milking and creaming business, you find nine times out of ten that he is not adopting one of the many necessary precautions adopted, as a matter of course, by farmers of countries which are becoming our strongest rivals.

As I have said, the danger of the dairying industry in Natal lies not with the Creameries, who are sparing no expense to make their part of the business more perfect, but with the suppliers—men who expect the Creameries to purchase unlimited quantities of milk from them, of course at top prices, quite indifferent as to whether it is saleable again or not.

During the past number of years the subject of aeration of milk and cream has received a good deal of attention. All suppliers of a factory should "cool" the milk as quickly as possible, but if the milk is not properly cooled it frequently arrives at the factory unfit for use. To overcome this defect aerators have been obtained which not only cool the milk but thoroughly expose it to the atmosphere. By aerating the milk animal odours and bad flavours escape. The operation, however, must be done in a sweet, clean place, or the milk will only be inoculated with foul germs. This cannot be impressed too firmly in the minds of the farmers. Milk which has been properly aerated will keep much longer than milk which has not been so treated, for not only does the aerating allow the gasses and bad odours to escape, but it is found by experience to improve the flavour of the milk.

The great cause, however, of bad milk is dirt, the cow sheds are unclean, the milk pails are unclean, and the milker himself is generally far from clean.

Suppliers of milk, etc., to Creameries require a deal of educating, and it is the Creameries which will have to educate them. The supplier has his share of the work in producing a good article by properly caring for the milk or cream until it arrives at the factory, and while his intentions may be good he must not feel indignant when the factory manager points out to him that he has unconsciously erred, and how he has erred. The aim of every supplier should be first-class milk or cream, and great care should be taken that no other kind is sent; towards this object proper aeration will be found a great help. Another matter that requires better attention is the straining of the milk. Of course, if the cows' udders were first properly cleaned and only clean milkers allowed to milk into irreproachable buckets, not much foreign matter would drift into the milk, but such is not the rule, and the straining rags in evidence in too many dairies speak eloquently as to the condition of the milk when it passed through them in its futile efforts to be purified. It seems almost superfluous to say that all milk strainers should be scrupulously clean and scalded thoroughly each time after using.

I think it will be admitted that I am interested in the welfare of the Natal farmer, I am not prejudiced against him, and I would not say anything against him were it not brought out by actual fact. In the foregoing remarks I have been very lenient with him, and I hope my consideration for his feelings will be rewarded by his paying a greater personal attention to his milk and milking, and do all he can to forward the success of what may yet be a great industry.

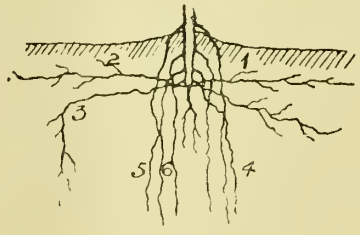
Mapstone Oats.

IN his annual report, Mr. G. R. Richards, the outgoing President of the Mooi River Farmers' Association, said :—All the old varieties of oats continue to be more or less useless for planting, owing to the certainty of their rusting at certain stages of their growth, but it is a matter for congratulation to record that the "Mapstone oat" seed, distributed by the Department of Agriculture this season to various members of the Association, has proved itself to be as good in its rust and frost resisting powers as the old winter oat even was at its best. I am of opinion from my own experiments that we have here an oat which will serve us for some years to come as a green fodder plant, thus filling a blank which has existed for some time past.

Mealie Roots.

NUMBERS 1, 2, and 3 are surface roots, or food gatherers ; 4, 5, and 6 are subsoil roots.

The fourth biennial report of the Kansas State Board of Agriculture gives the following description of the position and distribution of the corn roots in the soil to a depth of 4½ft., and indicates the office of each class and their orderly arrangement and development at a certain time for a certain work. The seed roots sustain the bud until the first green leaf appears. The first roots then follow, and seek the surface soil, which first feels the sun's warmth. These are in turn sup-



planted by the first roots that radiate from the butt end of the stalk like the ribs of an umbrella from the shaft, and spread out on a lower level, usually 5in. to 10in. below the surface, and often exceed 8ft. in length. These first circle roots are the main food gatherers, and send out numerous fibrous branches, in the direction where water and food are most abundant and temperature most favourable. The second and subsequent circle roots developing one after another as the plant increases in height, and the soil is warmed to a greater depth, seek the subsoil, and rarely spread out on the surface. Figures 2, 3, 4, and 5 show such roots, which were followed to a depth of 4½ft, with no terminal point in sight.

Disposal of Mealies.

ON the 28th ulto. a petition, signed by forty farmers of the Lion's River Division respecting the disposal of mealies, was sent to the Hon. Minister of Agriculture. The petitioners state that they are reaping mealie crops of from 500 to 1,500 bags, and they ask the Government to suggest to the Military Authorities the advisability of giving army horses and mules in Natal a daily ration of mealies. They further state that through the Johannesburg market being closed they cannot find buyers.

The Minister of Agriculture regarded the petition with favour, and in his minute on the subject pointed out the saving in cost which would result from partly substituting the feeding of oats by mealies. The A.A.G. Supplies, on the matter being brought before him, requested information as to the price required and the quantity available. His reply has been communicated to the petitioners.

Pound Notices.

THE Stock impounded as hereunder will be sold, unless previously released, on the 21st August next.—

Eshowe.—Light dun ox, white marks on both sides, no brands, four years old, and rather wild. Found wandering amongst Chief Ubango's cattle, and reported by the Chief.

Estcourt.—Running on farm of Mr. A. Woodgate :—Grey mare, branded JH on off side. Running on the farm Blanuw Krantz, of Mr. Frances : —Red cow with white spots, branded C or G on hind quarter, with a black heifer calf.

Nongoma. — Black ox, branded AD. Dark-grey cow, branded AD. Red heifer. Red cow, white belly, branded N, and calf. Black-and-white heifer. Black cow, branded LD. Red cow.

Howick. — Large black.and white ox, faintly branded ⊢⊣ on left hip.

Horses in time of War.

WONDERFUL ENDURANCE UNDER THE SADDLE.

THERE is much of interest to riders generally, but particularly to United States cavalrymen, in reports that have come from South Africa of some of the long, hard rides made there by the British mounted troops. The accounts of some of these rapid forced marches of cavalry are lacking in detail, but the specific statement is made that a squadron of the Natal Mounted Rifles recently rode eighty-five miles in twelve consecutive hours. The English Press speaks of rides of sixty miles by detached cavalry troops which are completed within the limit of the daylight hours, and these achievements of the troopers and their mounts are spoken of as though they were of frequent occurrence. At first thought it may not appear that these rides are particularly remarkable, but the fact must be taken into consideration that bodies of troops and not single individuals are concerned, and where this is the case the rapidity of the march must necessarily be gauged by the rapidity and endurance of the poorest horse in the outfit. Moreover, each animal engaged has to carry weight of man and equipment to an average amount of 250lbs. Many of the horses used by the English troopers are American bred, and a natural interest in this country is added to the rides, for it gives a chance to "get a line" on the endurance of the American animal under absolutely strange climatic conditions.

OPPORTUNITIES OF TESTING ENDURANCE.

No army in the world, perhaps, has had the same opportunities to test the endurance of cavalry horses as has the small regular force of the United States. The long, level stretches of the plains, and the activity of the marauding Indian mounted on his tireless broncho, have been the conditions which gave to Uncle Sam's cavalryman his matchless chances for long forced, mounted marches. Col. Theodore Ayrault Dodge, U.S.A., collected the official records of long-distance cavalry rides, and has made them public, so that they may be compared with the performances of the soldier horsemen of

other nations. Colonel Dodge declares specificially that he has rejected all "hearsay rides, of which there is no end," and has accepted only those proved by official reports. Colonel Dodge says that Capt. S. F. Fountain, United States cavalry, in the year 1891, with a detachment of his troop, rode eighty-four miles in eight hours. This record is vouched for, and it is better than that of the Natal Mounted Rifles by about four hours, the distance being within one mile of that in South Africa. For actual speed this forced march stands, perhaps, at the head of the American army record, though other rides have been more remarkable.

Remarkable Rides.

In the year 1879, when the Utes succeeded in getting some United States troops into what was afterwards known as Thornburg's "rat hole," several mounted couriers succeeded in slipping through the circling line of savages. All of them reached Merritt's column, 170 miles distant, in less than twenty-four hours. The exact time was not taken, for, as Colonel Dodge puts it, "rescue was of more importance than records."

It must be understood, of course, that all these American rides were made without changing horses. The steed at the start was the steed at the finish. The best rider, according to cavalry experts, is not the man who takes a five-barred gate or who can ride standing, but the man who by instinct feels the condition of his horse, and, though getting the most out of the animal, knows best how to conserve his strength. Colonel Lawton, now the General Lawton who is after Aquinaldo, in the year 1876, rode from Red Cloud agency, Nebraska, to Sidney, in the same State, a distance of 125 miles, in twenty-six hours. He was carrying important despatches for General Crook, and, though the road was bad, his mount was in good condition when Lawton, looking five years older than he did the day before, handed over his bundle of papers to the black-bearded genera .

A Forced March.

General Merritt has a forced march record that has no American parallel when the conditions of his journey are considered. He was ordered in the fall of 1879 to the relief of Payne's command, which was surrounded by hostile Indians. Merritt's command consisted of four troops of cavalry, but at the last moment he was ordered to add to his force a battalion of infantry. The "dough boys" were loaded into army wagons drawn by mules, and with the cavalry at the flanks the relief column started. The distance to be traversed was 170 miles, and it was made, notwithstanding the handicap of the wagons, and trails that were muddy and sandy by turns, in just sixty-six hours. At the end of the march the troopers went into the fight, and in the entire command not one horse showed a lame leg or a saddle sore.

Four troopers of the Fourth cavalry, who had volunteered for the particular service, were sent in the summer of 1870 from Fort Harney to Fort Warner with despatches, and were told to make the best time possible without killing their horses. The men were on their mettle. They made the distance, 140 miles, twenty miles of the way being through loose sand, in twenty-two hours, the actual marching time being eighteen hours and thirty minutes. At Fort Warner they rested one day, and returned to Harney on the same horses at the uniform rate of sixty miles a day. Captain Edmond G. Fechet started at midnight for the relief of the Indian scouts who had been sent out to arrest Sitting Bull, and who, after killing that chief, were beleaguered in a log hut by his followers. Fechet took an ambulance wagon and a Hotchkiss gun with him. The gun-carriage broke down, and he was compelled to fasten the trail of the piece to the tail-board of the ambulance, and thus drag it along. Notwithstanding this handicap, he made the first forty-five miles in less than seven hours. He fought and drove off the young Sioux bucks, then scouted the country for ten miles, gave his troopers some breakfast, and returned to the fort. Fourteen hours were consumed in coverieg ninety miles of ground.

The cavalry horses of the American army have undergone these endurance and speed tests carrying weights of more than 200lbs., and without any training other than that received in the ordinary course of frontier scouting and daily drill evolutions.

To Australia and Back.

By the Hon. T. K. MURRAY, C.M.G., M.L.A., Natal Representative to the Opening of the First Federal Parliament, May 9th, 1901.

AS it may be of interest to my fellow-colonists, I will relate my experiences and first impressions. My wife and I left Maritzburg on the morning of the 30th March in order to catch the *Sophocles* at Capetown, as the next steamer would arrive too late.

We were to have started from Durban early on Sunday, but, owing to the scarcity of labour at the Point, we did not leave till 5 p.m. The *Insizwa* is a very good little steamer, about 3,000 tons, and the captain and officers were all very obliging. We made a very good run down the coast; about eighteen hours took us to East London, thirty hours to Port Elizabeth, and we arrived at Capetown on Wednesday about noon. The *Sophocles* had not arrived from England, so we had to go ashore. We stayed at the Mount Nelson Hotel, certainly much the best hotel in South Africa. There we had to remain until Friday.

We were hourly expecting the arrival of the steamer, and, as she was only to stay a few hours, we could not go far from the hotel. On Friday morning we heard the steamer had arrived, and at once went down to the wharf. Although the plague was causing much trouble in Capetown we saw no sign of any kind, except the notices in the cabs that they were disinfected. At the docks, however, we had to obtain a certificate that our luggage was clean, and as we came on board the *Sophocles* each person had to pass the doctor, to put out his tongue and have his pulse felt. We were told that everyone had to have a thermometer put in his mouth, and as the same instrument was to be used, each was being naturally anxious for first turn. However this precaution was only taken in the case of two persons who had evidently been saying farewells to their friends, and whose temperature was probably high.

As soon as we were on board (about noon) our ship started, and we found the *Sophocles* a very comfortable steamer of about 5,000 tons. The cabins were the best I have ever seen, and ours was about 12ft. by 6ft. There were not many saloon passengers, about twenty, so we had plenty of room. The captain and officers are some of the best I have met.

Soon after leaving Capetown we went almost south, and found it very cold We were glad of all the warm clothing we had, and for several days the vessel was heated by steam pipes. We went south till we reached 45° latitude, and then went east. The route is much the shape of a saucer, instead of straight across, for two reasons—one, to get favourable winds, and the other, to get the smaller end of the earth, which the captain told us saves about 600 miles on the voyage. We gained about half-an-hour in time each day. Our daily runs from Capetown to Melbourne were 253, 255, 313, 305, 306, 281, 295, 289, 323, 293, 302, 306, 309, 285, 296, 308, 338, 333, 300 up to noon on the 24th, and we got into the harbour about midnight, landing on the morning of the 26th April.

We had some very rough weather a few days after leaving Capetown, and lost one side of our deck awnings one night. Then just before we arrived we were in the very bad weather which caused so many wrecks here; fortunately for us we were running in front of it.

The *Sophocles*, *Salamis*, and *Moravian*, are the best boats on this line; some of the old ones have the passenger accommodation aft. I asked the captain if there was not attraction enough to call at Durban coming out. He said it would mean losing two days, as they came so far south on the outward voyage; going back, however, they keep to the north.

An enterprising old lady, Mrs. Donald Cameron, from Tasmania, had quite a farmyard on board—a horse, four Jerseys, besides dogs, poultry, and partridges. She only paid as freight 45 guineas for the horse, 30 for the cows, and 15 for calves, though the distance is double that for which we pay nearly the same. I was also informed that freight on goods was about 27s. 6d. per ton.

MELBOURNE.

On our arrival at Melbourne we were again inspected by the Health Officer on account of the plague.

The *Sophocles* is one of the largest boats which comes up the Yarra River, the longer ones discharge at St. Kilda, and other places in the bay. We were brought about five miles up the river, which was very much in flood. The river is not wide, and more like a canal, with flat banks all the way up. The approach to Melbourne is by no means pretty.

Shortly after our arrival we were met by the Chairman of the Festivities Committee and brought to the Grand Hotel, just opposite the House of Parliament. All our surroundings were so much like a first-class London Hotel, that it was difficult to realise that we were not there. Melbourne is undoubtedly a fine city; including the suburbs and other towns which it has absorbed it has a population of nearly half-a-million. The streets are very fine, straight, and wide. The pavements are twenty feet wide on each side. If West Street in Durban had fine buildings, four to seven storeys high, all the way along, it would resemble Bourke Street here. The town is built on hills something like Rome, and the cable tram service is splendid, running up nearly every street and along cross streets, so as to quite confuse one. A policeman regulates the trams as he does the London omnibuses at each crossing. There must be hundreds of cars, they run everywhere, and every few minutes. There are always two cars, the first one open, in which the man who works the levers stands, and the others are ordinary closed cars. Fares are 1½d. in the city, and 3d. anywhere else. I have been four miles along one suburban line.

One sees a black man sometimes, as in London, and a few Chinese, but all the rough labour is done by white men. White men and women will not work with us in Natal as they do here. I am inclined to think they are better off with us. Here there are many very roughly dressed poor looking whites, such as one does not see with us, and a good many beggars; but, then, Melbourne is a big place.

I spent an afternoon in the Denton Hat Factory, which is complete in every way. They employ about 300 men, women, boys and girls, and manufacture both wool and fur into hats. It was very interesting. All labour is by piece-work. The men earn about £3 a week, and the women from £1 to 30s. I enquired what it cost men to live, and was told single men could board at about 15s. a week. There is at present a very high protective tariff of about 3s. a hat. There are quite a number of factories of all kinds here, but still they do not seem to be able to compete with European manufactures.

The Zoological Gardens here are very nice. The kangaroos are most amusing. When going slowly they put their short front legs on the ground, but when fast they just jump along on their hind legs and great strong tail.

The Botanic Gardens are very pretty, and well kept, but I saw nothing out of the way there.

Government House is situated across the river from here, on a hill. They are completing one of the finest parades in the world, I should think, all along the north bank of the Yarra, five rows of trees. There is an iron bridge about thirty feet wide, and a carriage drive about fifty feet, then a bicycle track about twenty feet, and a walk about twenty feet wide. When the trees are grown up it will be lovely. Government House and grounds, and the Botanic Gardens overlook it, and the river on the other side. Stands, arches, and illumination poles are being erected everywhere. There is to be a great time here, decorations going up all round, and some buildings already illuminated.

The one thing quite behind the times is the postal rate, 2d. to adjoining Colonies, and 2½d. abroad.

I am also disappointed with the horses, having hardly seen a decent pair yet, while the traps and horses do not look smart and well groomed. There are a great many American spiders used. Have not seen a bullock in the yoke yet. The gum trees about here are also small and stunted.

Mr. Barton, the Prime Minister of the Federation, and Mr. Peacock, the Premier of Victoria, are both staying here. They are distinguished as Prime Minister and Premier. I got a bit mixed with these titles at first.

The Capital of the Commonwealth is to be in New South Wales, but, as a compromise, not within a hundred miles of Sydney. The Federal Parliament will sit in Melbourne till the new place is ready, probably five years hence. The Federal Parliament will decide where the new Capital will be.

The weather here is quite wintry; large coal fires morning and evening, and top coats are the order, just as in an early English winter. I am told it is very hot and dusty in summer, when hot winds prevail.

The cabs here are mostly covered waggonettes, with one horse. They hold four people; the sides have coloured glass, and behind the driver there is a window which is drawn aside when you communicate with him. There are some hansons, no 'busses.

Oaks and beeches are planted along most of the street sides, which gives them a nice appearance. Gardens and flowers are also plentiful along the dwelling streets. In the suburbs there are very well kept grounds to the houses.

BALLARAT.

Yesterday the Prime Minister arranged a trip, which we enjoyed very much, to Ballarat, which consists of Ballarat City, and Ballarat East, both having Mayors, with a total population of about 40,000. It is about 75 miles west of Melbourne, and about three hours by rail. The first portion of the journey is over very flat uninteresting country, without trees, but all occupied and fenced, being laid out in small farms. On nearing Bacchus Marsh the country becomes wooded, mostly with stunted swamp gums, which look very much like our waterboom, a valueless kind of tree. Here, even the country has a desolate appearance, as many of the trees have been ringed, and are dead. The object seems to be to get rid of them. Then we went through prettier and more hilly country; here, I was told, they grew wonderful crops of potatoes, and land was worth up to £80 an acre. 300 acres is a very big holding. The cows I saw all looked thin, and everywhere the grass is fed down to almost bareness. We saw a few small lots of sheep, mostly long-woolled kinds. Ballarat is about 1,500 feet above Melbourne, and they seem to think that quite high.

The train service is good; the carriages are like the Cape corridor, but the railway stations are very poor. The farm cottages and outbuildings are mostly wooden.

On our arrival at Ballarat we were received by both Mayors, and driven about to places of interest. Among them to the stone monuments, where gold was first discovered in 1851, and to the old alluvial workings. There are several gold mines in the neighbourhood, but we did not visit them. The lake, botanical gardens, and the drive round the lake are all fine, three miles long, with a splendid avenue all the way. The botanical gardens are very pretty and well kept; they contain some very fine statuary presented by an old resident. We visited a very complete woollen factory, employing about 300 hands.

In the afternoon I attended a meeting of the City Council, and was honoured with a seat next the Mayor. Adjournment was made to the Mayor's parlour, where refreshments were provided, and my health proposed. The question of the amalgamation of the two towns is being discussed. One would never know there were two towns unless told so. The principal street is very wide, with gardens and statues up the centre. It is often called the Garden City, or City of Statues.

This evening I am leaving for Sydney, which I will describe in my next.

(*To be continued*).

Indian Labour.

FROM the Annual Report of the Protector of Immigrants, the following excerpts are taken :—

During the whole of my experience in the Indian Immigration Department, now close upon 38 years, I have never known the demand for indentured Indian labour to have been so great as it has been during the year under report. Almost every post brought letters from farmers and

others in the upper districts of the Colony begging for the allotment of Indians. Many of the applicants stated that it was absolutely impossible to get native labour at any price for farm work, and that unless they could possibly obtain Indian labour, they would have to give up farming altogether. The planters on the coast were also very short of labour. Unfortunately the supply of labourers from India during the year was by no means equal to the demand. Calcutta has closed for all but one month during the year, consequently the Board has to depend entirely upon Madras for the supply of labour. From that port 2,855 men came forward during the year. At the close of the year 1899 there remained an unsupplied balance of 4,219 men, and in addition to this number 6,323 men were applied for during the year, making a total of 10,542. Of this number 3,168 men arrived during the year, leaving a balance of 7,374 men unsupplied at the close of the year.

Some 2,186 men and women completed their indentures during the year, and received certificates of discharge from service under indenture. The majority of these people have gone to swell the already large numbers of free Indians working on their own account, as small farmers, market gardeners, hawkers, etc. Every year more land is taken up on the coast by free Indians, by purchase or on lease, principally for cultivation. Large numbers of free Indians are now the registered owners of a considerable extent of land on the coast, and the cultivation of mealies, beans, tobacco, and vegetables is almost entirely in the hands of these people. Several free men are also growing cane for the Central and other mills, and are doing remarkably well.

Field hands are generally employed at task work, which they very much appreciate. Under this system, the men invariably finish their day's work early in the afternoon, and have the rest of the day to themselves. Women are also employed at task work of the lightest description, thus enabling them to get off early in the day to attend to their domestic duties. The contract provides nine hours a day for labour, with a break of at least an hour for rest, and this simply means keeping the men in the fields from sunrise to sunset. Since the system of task work has been introduced, contract hours are looked upon, by the majority of indentured Indians, as a punishment more than anything else. The task system is a very good one, and operates satisfactorily both in the interests of the Indians and their employers.

Belgian Hares.

HOW TO BREED IN NATAL.

By H. S. POWER, J.P.

AS the present time is one which is proving sorely troublesome to both town and country people, especially the latter, with regard to food supplies, the breeding of Belgian hares appears to be attracting more attention than hitherto. One great thing in its favour is that it does not want a large capital to start matters on a proper footing, and given the necessary care and attention, there is no reason whatever why it should not prove both a remunerative and an amusing pastime to the breeder. It is an industry which does not interfere with the legitimate work of a farm, but at the same time will undoubtedly supplement the farm profits.

When one comes to take the *pros* and *cons* of poultry and hare farming, I should certainly plump for the latter, more especially as it appears to be the rule of the poultry fancier to breed for feather and markings, to the detriment of breast and other table qualities. Again, with regard to disease, I think most of your readers will agree with me that in this country poultry seem liable to most of the ills that flesh is heir to, whereas with the Belgian hare my experience has been that disease appears to be narrowed down to an affection of the liver (which certainly bowls over a lot of the little ones now and again), but as the

does are such prolific breeders this does not appear to be very noticeable.

The flesh of the Belgian hare is of good and delicate flavour, and the more they are eaten the more they are appreciated.

Mr. R. J. Lloyd-Price (a great rabbit breeder in the Old Country, and who has written a book on the subject, "Rabbits for profit and rabbits for powder," wherein some valuable hints are given, and especially on hutch breeding), advocates a cross between the Belgian hare and the English wild rabbit, but this, I should imagine, would not only have a tendency to reduce the size, but be also hardly feasible in Natal.

My own experience of the English wild rabbit out here is that he is a complete failure. I imported some for the purpose of trying the cross with the Belgian, and turned them (the rabbits) down in a well-made warren, part of which consisted of a plantation of trees for shelter, and also a few loads of brushwood, poles, and grass, for immediate protection until they had had time to make their burrows. The balance of the land consisted of two acres of grass veld, and the whole was enclosed in special rabbit-proof wire netting sunk into the ground. This was some 2½ years ago, and in spite of care and trouble, and also warnings from friends that I might turn the place into a second Australia they have multiplied—out of existence.

Another failure I have to record was an attempt to breed up our wild Natal rabbit (which runs to 6lbs. and 7lbs. in weight) for the purpose of crossing with the Belgian. Full-grown, half-grown, and pairs taken from the nest (our Natal rabbit follows the fashion of the English hare by breeding twos) and put with Belgian mothers, all refuse to live out of sheer cussedness, and therefore nipped in the bud what should have been an interesting experiment. My chief reasons for attempting this cross were to continue the size of the hares, and also increase their hardiness by a cross with an animal indigenous to the Colony. I only hope others will attempt this cross, as undoubtedly there are benefits which might accrue from both sides. One mistake has already been made in Natal, I refer to the crossing of the Belgian with the ordinary domestic lop-eared rabbits which does not increase the size, and only tends to propagate rainbow-coloured specimens at the expense of the true wild appearance of the pure Belgian.

Now as regards breeding the Belgian, pure and simple, and the necessary adjuncts thereto.

It would probably be easier and better for anyone wishing to start and breed them, to obtain his stock from someone who is already breeding them in this country. The great thing is to try and obtain hares that are pure bred, and then after he has got into the run of the thing, to import stock from England to improve with. Importing comes by no means expensive if care is taken over the matter, but of this I could give further particulars at some future time if required.

With regard to hutches "the Morant" hutch (a hutch patented some years ago by Major Morant) is probably the best, as it saves a lot of trouble in cleaning out and feeding. There is one kind for breeding does, and another for young ones, the latter holding about twelve. These hutches are made with wire netting bottoms so that the hares can eat the grass through the meshes, and a strip of zinc run all round to prevent the wood getting spoilt by weather, &c. One side and one end are boarded up, the other side and end being of 1-inch mesh wire netting; sloping roof of boards. Inside, along one end is a fixed board to enable the hares to sit on when the hutch is moved, and also for them to rest off the damp earth. The roof is on hinges, so as to allow of bran or corn being put in daily, hares taken out if necessary, etc., and the beauty of the hutch is that by shifting it its own length two or three times a day the hares get their own green food without the trouble of having it cut and brought to them. A patch of grass should thus be kept in good order by being well fed off, and at the same time in good condition by the coating of manure left from the hares.

Another good thing about these hutches is that at night each four can be placed together in such a manner that nothing but the boards are facing outwards, thus keeping all cold winds and rains away from the occupants.

I have not adopted this principle myself, as, unfortunately I had made my start

before hearing of the "Morant" hutch. My own breeding does are kept in good roomy hutches, and the sides of the shed being wattled and not plastered, allows a free current of air to pass continually through the place. Shed roof of thatch. Barring the trouble of the hutches having to be cleaned out regularly, and the use of a little disinfectant to keep them nice and sweet, I have no cause for complaint.

The young ones are taken from their mothers at the age of 5 to 6 weeks, and are put by themselves into large hutches in the shed, and from there, when a little stronger, into a covered run. About a month later they are put into open wire netting runs, which contain a few boxes or sheets of iron for shade and protection from weather, and there they remain until fit for market. Of course this process entails the gathering of green food to feed the hares on.

As regards green food, one cannot go far wrong, grass, blackjacks, thistles, cabbages, turnips, swedes, sweet potato tops, and roots, etc., they will thrive on, and a handfull of mealie bran should be given to each hare once a day, evening for preference.

The does go with young 30 days, and should not be bred from before they are six months old. About three days after the young ones are weaned they may be put to the buck again. An hour will be found amply sufficient for keeping the doe with the buck, longer than this does harm to buck and doe. The litter will vary from 5 to 9, but I consider 5 or 6 are sufficient for the mother to rear thoroughly well. It is as well to give the does a little salt in their bran when they are weaning their young, as this helps to dry up the milk. A pinch may also be given occasionally to the young stock to keep them in health.

I find it a good plan to operate on the young bucks, as this prevents a lot of fighting, and in my idea makes them fill out quicker; it also enables one to run bucks and does together. A Native will become an adept at this work with once showing, and the danger is practically nil.

The hares are ready for market from five to six months old, and a six month old hare should weigh from 5½ to 6½lbs.; they will lose 1½lbs. in the cleaning. Of course, the longer they are kept the heavier they will grow (some of my breeding does weighing 9lbs. each), but as soon as they are fit for market they should be sold, as every extra week adds to the expense of keep, and lessens the profits.

They are apparently a little slower growing in this country than in England, but this I fancy most people will have found with any kind of stock.

Another thing which I had almost forgotten to mention is that when a doe has young she should be given a little water or milk; if the weather is hot her thirst may cause her to eat the young. This eating the young seldom occurs, and when it does is generally put down by many people to the mother's jealousy of her young and not liking anyone to go near her, but I can assure them thirst is the cause. I have bred very many hundreds, but have never once found a doe to eat her young ones through examining the nest or handling the young, even if only a few hours old.

If rats should prove troublesome, which I have not found to be the case, Lloyd-Price suggests small pieces of sponge soaked in honey and baked in the oven being placed about their haunts as a very efficient remedy.

Cats I have also had no bother with, as my own have been practically bred up amongst the hares, and consequently take no notice of them.

And now, having bred your hare, you will find that there are several ways of cooking him to advantage. One I can recommend is—cut him in pieces and put in a deep pie dish with a good crust top and bottom, a little water to help the gravy, and snippets of bacon here and there among the pieces for the sake of variety, seasoning to taste. I can assure you if you are blest with a good country appetite you might go further and fare worse.

In proportion to area, it has been declared by a French writer that there is no country in Europe in which agricultural co-operation has been more extensively adopted than in the Grand Duchy of Luxembourg. Last year there were 760 associations, with 43,568 members, divided into the following branches:—(1) Societies for creating new roads and improving the land, (2) associations for buying artificial manures and implements, (3) live stock insurance companies, and (4) butter factory associations.

CORRECT. INCORRECT.

Pruning Citrus Trees.

THE above photographs show, by contrast, the injurious effects of incorrectly pruning trees of the citrus variety on the Coast. The photographs represent two trees at Mr. Vincent Seymour's fruit farm, Malvern. The photographs were taken from exactly the same distance from the stems of the respective trees. The tree which is a failure is pruned up to 2 feet 6 inches from the ground, while the other, which was allowed to branch out at about 18 inches from the ground, is as fine a specimen as a grower can wish to see. The soil and all other conditions of the two trees are identical. They constitute, as Mr. Seymour remarked in the "Interview" (No. 3, Vol. IV.), an excellent object-lesson. By leaving the branches low down the stem is protected from the sun. "The wood," says Mr. Seymour, "is hard, and the outer bark is closely attached to the wood, and will not stand the direct rays of the sun, especially when the thermometer registers, as it does sometimes, 90 to 95 degrees in the shade."

The *Taieri Advocate* states that several well-known gentlemen in the Taieri district have been attempting to open up a cattle trade with South Africa. Dairy cattle landed at Durban would be worth £30 each. The chief difficulty is presented by the fact that in certain weather conditions it is impossible to land cattle at Durban, and the shipowners will give no guarantee as to their disembarkation (!)

Coast Geology.

THE following geological observations of Mr. William Anderson, geologist, on the formation of the Bluff, Durban, and the adjacent country, are published by order :—

Geographical Survey,
Surveyor General's Office,
Pietermaritzburg, Natal,
June 12th, 1901.

J. L. MASSON, Esq.,
Surveyor-General.

SIR,—I have the honour to furnish you with a geological report on papers (L & W $\frac{2518}{1901}$) dealing with the prospects of obtaining payable coal under the Bluff, Durban

The country around Durban harbour from the Umgeni to the Umlaas River, with a few local exceptions, is covered to a considersble depth with Pleistocene and Recent sands and clays. There are, therefore, few outcrops of rock to be seen. At the Umgeni Bridge the Dwyka, a conglomerate, outcrops at the surface, and is worked at the Corporation Quarries. The next outcrop of rock that I know of is at Congella, where black carbonaceous shales, with intrusive basalt occur close to the railway line. On this outcrop a bore was put down by Mr. Jonsson, to a depth of over 300ft. Mr. J. Goodricke has kindly furnished me with information relative to this bore and the others in the neighbourhood put down by him. The rocks passed through were dark carbonaceous shales, with occasional intrusive sills of basalt. At some depth an artesian mineral water was struck, which still overflows from the bore.

Further to the south, at Clairmont quarry, the Palæoroic sandstones occur. Some time ago, a bore was put down, on the flat, to the south-east of the quarry, to a depth of 150 feet. This bore passed through basaltic rock (not felsite as recorded in the Mines report for 1892), and sandstone, which is, undoubtedly the Palæoroic sandstone of the quarry. These sandstones are older than the Dwyka conglomerate, which rests unconformably upon them, and their presence is, therefore, significant in curtailing the area occupied by the conglomerate and Ecca series which usually overlie it.

About a mile to the north of the crossing of the Umlaas river, the Dwyka conglomerate crops out on the road. The ridge known as the Berea is composed of the same rock, which, however, does not often show at the surface, as it is covered with a good depth of sand.

In the outcrops of these rocks, the Dwyka conglomerate at Umgeni quarry, the same rock forming the Berea, the Palæoroic sandstones at Clairmont, and the Dwyka conglomerate at the Umlaas river, we have, roughly, the boundary of the Ecca series, landwards. The shales which crop out at the Congella bore have a hardly appreciable dip, to the eastward, and therefore, in their projection, they pass under the alluvial deposits of the Bay.

The Ecca series, as it is exposed in the Umhlali district of the north coast and in the coalfields of Zululand, have invariably the same succession, that is, a series of black shales, generally carbonaceous, resting, usually with a slight unconformity, on the Dwyka conglomerate. These are succeeded by a less thickness of light grey-coloured shales, and they, in their turn, by the coal-bearing series of sandstones and shales with thin coals. There is no break in the succession of strata from the Dwyka conglomerate up through the shales to the coal-bearing portion of the Ecca series, with the exception of the slight unconformity immediately above the glacial conglomerate.

In the Durban area we get the basal conglomerate, and in the Congella bore, over 300 feet of black carbonaceous shales, which are undoubtedly the representatives of the black shales overlying the the Dwyka conglomerate in the areas mentioned above at Umhlali and in Zulusand. The overlying and upper portion of the Ecca series, comprising the light shales and the coal-bearing series of sandstones and shales, are not anywhere exposed in the Durban area, if they exist there, owing to the large quantities of Pleistocene and Recent alluvials which cover the surface.

The distribution of the Ecca series along the coast of Natal is as follows :— Between Port Shepstone and Isipingo out-

crops of the lower members of the series, the Dwyka conglomerate and black shales, fringe the coast at intervals. Between Isipingo and Umgeni river mouth we have the Durban basin, which I have just described. Further to the north is the edge of the basin which exists at Tongaat and Umhlali, and some miles to the north of the Tugela river mouth we get the basin of the Umlalaas coal-field in Zululand. These various outcrops of the Ecca series, bounded inland by the outcrop of the lower part of the Dwyka conglomerate, may individually be portions of isolated basins of Ecca strata, or they may represent the denuded, irregular edges of one large basin, the bulk of which is still under the sea. The coal-bearing portion of the Ecca series does not extend farther inland than four miles from the coast, except in the case of the Umlalaas Coal field in Zululand.

With regard to the Bluff itself and the ridges which connect it with the mainland, few rock outcrops occur, except at the lighthouse end. Here the rocky bluff, which faces the sea, consists of a much eroded and weather-worn cliff of yellow calcareous sandstones, showing remarkably good examples of false bedding, which has been made very apparent by weathering. So far as I could discover, they are entirely unfossiliferous and therefore there is no clue to their age. They are, however, certainly younger than the Ecca, upon which they rest unconformably.

There are no rock exposures on the sand covered connecting ridges, in fact, the first outcrop is probably this same rock which occurs on the beach at Wentworth. I believe it also occurs at Isipingo, while it is reported to be present to the west of Clairmont quarry, where it rests upon the Palæoroic sandstones. At the northern end of the Berea, above the Umgeni quarry, there are evidences, in the alluvial sands, of its having existed locally, and probably much of the nodular calcareous material which occurs disseminated through the surface sand, has been derived from the denudation of this local outlier of the Bluff rock.

On the seaward face of the Bluff, a few hundred yards south of the Cave Rock, remains of a raised-beach occur, more than twenty feet above the present high water mark. Its presence here has, no doubt, been due to the calcareous nature of the sandstones forming the Bluff. The materials of which it consists have been cemented together by the calcareous matter derived from the sandstones. Very little of the old beach now remains, except small patches which have survived denudation by the protection afforded them, by their position, in the crevices and cavities of the decomposad face of the cliff. The contents of this beach are chiefly oysters and other mollusca which are probably of the same species as those now living in the neighbouring seas; showing that this elevation of the land, as exemplified by the presence of the ancient raised beach, so many feet above the present water level, must have taken place within geologically recent times.

This raised beach has, however, another and very important significance in reference to the present subject. The materials of which it consists are chiefly coarse sand and a few well rounded boulders, but mixed with them and scattered through the mass occur numbers of small pebbles of black and grey shales, which could only have been derived from the rocks forming the bed of the ocean to the south-east. These are undoubtedly fragments of Ecca shales, and their presence in this old shore deposit, facing the ocean, goes a considerable way to prove that some portion of the Ecca series exists on the ocean bed to the south-east of the Bluff. The inference necessarily follows, that it is probable that the Ecca series are continuous from the shale outcrop of the Congella bore, underneath the alluvials of the Bay, and under the calcareous sandstones of the Bluff.

With reference to the parallel drawn by the miner Martin Nolan, in his letter, between the formation around the Bluff and the country around Sydney, from a physical point of view there is none, except that each possesses a harbour. From a geological point of view there is a certain analogy, but there are also some very wide differences, as can be seen by comparing the two sections on the attached Diagram No. 1.*

** The diagrams referred to may be seen at the Office of the Surveyor-General.*

At Sydney, the geological structure is a simple synclinal trough consisting of the Hawkesbury sandstones (Triassic) overlying, with the intervention of the Narrabeen shales, the coal-bearing Permo-carboniferous series, which outcrops on the surface, at the edges of the trough, to the north in the Newcastle district, and to the south in the Illawarra district. For a number of years special attention was given by the Geological Survey to the geological examination of these outcrops, which are separated from one another by 100 miles of country, over which the Hawkesbury sandstone is the surface rock. The various coal seams in the southern outcrop were ultimately correlated with similar beds in the northern coalfield, chiefly by means of palaeontological evidence, with the result that the beds forming the two outcrops were proved to be portions of the same series of strata, and therefore of the same age. The inference drawn from this knowledge, together with the stratigraphical evidence as to the geological structure, disposition and relations of the Hawkesbury sandstones to the coal-bearing series, was that there was a great probability of the coal-bearing series persisting in a trough-like form, underneath the Hawkesbury sandstones and Narrabeen shales. This would mean that the beds outcropping in the Newcastle district were continuous under the Hawkesbury and Narrabeen shales with those which outcrop in the Illawarra district. The result of this conclusion was the putting down of a bore on Sydney harbour, which was successful in striking the coal-measures within a very short distance of the depth at which Professor David, then of the Geological Survey, computed they would be found.

In conclusion, I would state, that there is little doubt of the presence of the Ecca series below the calcareous sandstones of the Bluff, and it is possible that there may be thin coal seams among them, just as there are on the coast at Umhlali, but the question as to the occurrence of payable coal is very problematical. If the series keeps the low dip to the east, which it has at the Congella bore, across the Bay to the Bluff, a distance of about three miles, there is certainly not much room for the coming in of any thickness of beds, higher in the series than those at the bore, which is undoubtedly sunk in the black shales immediately overlying the Dwyka conglomerate. A persistent dip of 3°., without the intervention of faulting or other displacement of the strata, would allow of a little over 800 feet of beds being brought in, from sea level at the Bluff, down to the horizon of the shales at the top of the Congella bore. There is no evidence to prove at what depth from the surface the unconformity between the Bluff sandstones and the Ecca series occurs. The deeper this is, the less will the thickness of the Ecca beds be. If the dip alters and assumes a high angle, then there would be a probability of getting the coal-bearing series of the Eccas under the Bluff. The same would result by the intervention of faulting with a down throw from the eastward, but judging from the districts in which I have seen the Ecca coal-bearing series, faulting to any extent is very rare. As I have previously stated, the prospects of obtaining payable coal under the Bluff are not of an encouraging nature.

The sections attached explain themselves ; No. 2 is a section from the Berea, across the Bay to the Bluff, showing the geological structure as I interpret it.

I have the honour to be,

Sir,

Your obedient servant,

WILLIAM ANDERSON,
Government Geologist

Correspondence.

To the Editor Agricultural Journal.

HOW TO IMPROVE THE "JOURNAL."

SIR,—I wish, in this short article, to emphasize the sensible letter in your journal of the 5th instant, by Mr. Geo. J. Wood. If our farming "Members" would encourage the *Journal*, instead of crying it down, our agricultural knowledge would probably increase in a like ratio. Truly, Mr. Wood proclaimed a melancholy fact when he wrote, "Farmers

are the worst correspondents in the world." I wonder whether a bonus and high protective tariff would induce our farmers to spend a little more time in matters of erudition, and a little less in this proverbial "grumbling"?

At the same time I agree with Mr. Wood about paying for information. "Time is money," and busy men, who for two years past have been paying very dearly for the necessaries of life, which farmers are supposed to produce (aye, and farmers who have never yet paid a penny in *direct* taxation), cannot afford the time or even the waste of brain power unless properly requited for their labour.

Hoping we shall hear no more about "doing away" with the *Agricultural Journal*.—I remain, Yours, &c.,

WM. LISTER,

Pietermaritzburg, 11th July, 1901.

Sir,—I note with interest and satisfaction the several suggestions by Mr. G. J. Wood in the *Journal* just to hand for the improving of same, and fully support him in the seven points or subjects enumerated, and as you have so cordially invited further suggestions, I beg to introduce a subject which, if adopted, I am of opinion will undoubtedly be the means of making the *Journal* a further medium of thorough usefulness to all, and especially the farming community, and that is :—That every issue of the *Journal* should contain one or more of the Laws of Natal, commencing with those most important to farmers, viz. :—Pound Law, Masters and Servants, Grass Burning, Fencing, Cattle Stealing, Scab Law, etc., etc. Everybody is supposed to know the law, but Heaven protect them if they have to by means of the scanty source available, apart from the lawyers and the very rich, who can pay fourteen guineas for three volumes, Quite eight out of every ten have never seen the laws.—Thanking you, &c.,

J. A. F. ORTLEPP.

"AMERICAN WONDER" LEMON.

Sir,—In page 282 of the *Agricultural Journal* you mention a new lemon, "American Wonder." Can this lemon be obtained in the Colony, or where can I obtain a few trees to try ?—Yours, &c.,

A. B. RICHARDSON.

New Hanover.

[Two of the leading Maritzburg nurserymen do not know the lemon. The reference to the lemon was a "gleaning."—ED. *A. J.*]

Dear Sir, — Seeing the account of Canadian implements and prices in the *Journal* of June 7th, can you inform me if Mr. Cumming is thinking of establishing a depôt in Natal for selling farm implements at anything like the prices charged in Canada? Or, do you know of any Natal firm who can do windmills, farmers' buck wagons, mowers at anything like prices quoted? If I could get them at Canadian prices I would buy at once. Is it possible by the various farmers' associations combining to import implements from some good American firm ?—Yours, etc.,

E. MARRIOTT.

Ixopo.

[The farm implements referred to by Mr. Cumming cannot be bought "at anything like" the Canadian prices quoted. Mr. Cumming's primary object in visiting Natal was to find out from personal observation, for his Government, what openings there might be in the Colony for Canadian manufactures. What may result from his inspection remains to be seen. The purchase of farm implements for members is largely undertaken by Agricultural Associations in very many countries.—ED., *Agricultural Journal*.]

Animal warmth is produced at the cost of food. Winter weather considerably reduces the warmth of animals, and this loss must be recompensed in some way, else the animal will lose in condition and health. Loss of warmth can be partly prevented and the comfort of the animal ensured by the use of rugs. The rugs need not be costly, because old bags even can be utilised for the purpose. The rugs can be kept in place by straps or cords, and should be removed during the daytime whilst the animals are out in the paddocks. Cows, especially, will benefit from the employment of rugs, as they have the double drain upon their digestive organs in providing for the maintenance of warmth and condit on and in s pplying milk.—*Journal of Agriculture, South Australia.*

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	W. Ralfe	Ennersdale.
		,,	F. R. Moor ...	Greystone.
		,,	Cooke & Co. ...	Blue Krantz.
		,,	F. Bloy ...	Monte Christo
		,,	— Maritz ...	Springbank.
		,,	Jas. Ralfe ...	Frere.
		,,	F. Knapp ...	Klipfontein.
		,,	G. M. Rudolph ...	Spitzburg.
		,,	J. W. Moor ...	Moorleigh.
		Lungsickness	A. & W M. Henderson	Elands Park.
J. Button ...	Estcourt, South of Bushman's River	Scab	H. J. Hurd ...	Weston T'Lands
		,,	J. W. Haw ...	Woodleigh.
		,,	H. Albrecht ...	Brynbella.
		,,	S. Nel ...	Wagon Drift.
		,,	D. Mackay ...	Dalton.
		,,	R. Mattison ...	Fernhurst.
		,,	C. C. Randles ...	Glen Lyndon.
		,,	C. Cope	The Hoek.
		,,	J. Mattison ...	Klip Stone.
		,,	C. B. Lloyd ...	Hidcote.
A. H. Ball ...	Weenen ...	,,	T. J. Van Rooyen	Belle Vue.
		,,	C. Van Rooyen & J. S. Els	Scottsberg.
		Lungsickness	Mgina... ...	Location
J. J. Hodson ...	Lion's River ...	Scab	Jas. Morton ...	Tweedie Hall.
		,,	A. S. Parkinson ...	Shafton Grange.
		,,	A. C. Thomson ...	Fort Nottingham.
		,,	W. Taylor ...	Fordoun.
		,,	W. T. Shaw ...	Shawswood.
		,,	W. Pepworth ...	Bolesworth.
E. J. B. Hosking ...	Upper Umkomanzi	Lungsickness	H Gillespie ...	Intimbankulu.
		,,	Geo. Hackland & Sons	Inhlayuka.
		Scab	H. Nicholson ...	Alton.
R. J. Raw ...	Impendhle ...	,,	P. Ogram ...	Till tudleni.
		,,	— Roberts ...	Ebrington.
		,,	C. P. Spiers ...	Mount Park.
		,,	Sobuqu, Verta & Pinda	Natal Land & Colonisation Co's farms.
		,,	Nozulela ...	Nooitgedacht.
		,,	T. Fleming ...	Good Hope.
		Lungsickness	Donga ...	Johnstone.
		,,	C. C. Lewis, and Native ...	Clairmont.
W. Wilson ...	Polela	,,	H. Eaglestone ...	Coleford and The Bungalow.
		,,	Miller, Bros. ...	Polela.
		Scab	H. Nicholson ...	Fondling.
		,,	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
C. E. Hancock ...	Ixopo ...	Lungsickness	W. W. Walton & Natives	Dronk Vlei.
		Scab	Malambula ...	Location.
		,,	Qinisani ...	Klipgat.
		,,	R. Kennedy ...	Cornhill.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
C. E. Hancock ...	Ixopo ...	Scab	A. Watson ...	Rosehill.
		,,	Archibald & Co. ...	High Flats.
		,,	W. Gray ...	Helmsley.
		,,	Momololo ...	Umgodi.
		,,	Natives ...	Langefontein.
		,,	E. H. Surridge ...	Chadwell.
		,,	Rulumeni ...	Farm adjoining Chadwell.
		,,	J. Dalgarno ...	Abercairney.
		,,	A. Stone	Craigie Lee.
		,,	W. W. Walton ...	Dronk Vlei.
J. F. Bernard ..	Newcastle	Lungsickness	A. A. Osborn ...	The Mount.
		,,	J. F. Grant ...	Hilldrop.
		,,	J. Mortimer ...	Try Again.
		,,	P. W. Dept. ...	Newcastle T'Lands
		,,	D. Dewar ...	Newcastle T'Lands.
		,,	Nehorasing ...	,,
		,,	— Roberts ...	,,
		,,	C. Watson ...	River Bend.
		,,	H. James ...	Kalbaslaagte.
		,,	J. R. Watt ..	Horn River.
		,,	G. Matthews ...	Shakespeare.
		,,	A. & S. J. James...	Paradise.
		,,	G. E. Jubber ...	Brackfontein.
		,,	Digeto ...	Rooi Point.
		,,	W. L. Oldacre ...	Nil Desperandum.
		,,	A. J. Crawford ...	Newcastle T'Lands
		,,	C. Collyer ...	Stilazie's Kop.
		,,	W. Adendorff ...	Hope Farm.
		,,	N'castle Corporation	Newcastle T'Lands.
		,,	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		,,	J. W. Goodwill ...	Cornwall.
		,,	Messrs. Wade, Bros.	Macclesfield.
		,,	Harvey & Ketalbach	Lease 42.
		,,	H. S. Dicks & Sons	The Retreat
		,,	A. Danks & Fox...	Crown Colliery.
		,,	A. Paine ...	Mount Prospect
		,,	F. W. Hatley ...	,,
		,,	E. Parker ...	,,
		,,	Unjopal & Eseresing	Newcastle.
		,,	A. H. Tatham ...	,,
		,,	Natives ...	Droog Plaats.
		,,	A. Krause ...	Filexton.
		,,	G. W. Nourse ...	Ruth, Highton & Inniskilling.
		,,	Simeon Ndhlovu	Freda.
		,,	S. W. Reynolds ...	Newcastle T'Lands.
		,,	O. Olver ...	,,
		,,	G. W. White ..	Ruth.
		,,	C. R. Savory ...	Pomeroy and Evin.
		,,	Blizzard & Pratt	Ingogo.
		,,	J. W A. Welsh ...	Paradise.
		,,	G. Star ...	Lennoxton.
		,,	G. Wood ...	Heron's Court.
		,,	W. L. Jee ...	Lennoxton.
		,,	A. F. Henderson...	Brazil.
		,,	D. Uquhart and Natives ...	Laureston.
		,,	A. J. Crawford and Natives ...	Diamond.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	Natives ...	Milton.
		,,	Lowrens and Van der Merwe ...	Buffalo River.
		,,	H. Fick ...	Northdown.
			H. Austin ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	Natives ...	Elizabeth Dale.
		,,	J. Masangu ...	Pernambuco.
		,,	Frinwayo ...	Tiger Kloof.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	G. W. Nourse ...	Glen Harte & De Wetstroom.
		,,	W. Steele ...	Tweefontein.
		,,	— James ...	Newcastle.
		,,	A. S. Carbairns ...	Mooi Plaats.
		,,	Umketega ...	Vrede.
		,,	Bonombi ...	Heron's Court.
		,,	F. Stevens ...	Newcastle.
		,,	A. J. Hurd ...	Tweefontein.
		,,	G. J. Way (Derelict Stock) ...	Vrede.
		,,	Mtshabane ...	Reserve.
		,,	Mahakan ...	Kilbarchan.
		Scab	F. R. Tewson ...	Rooi Point.
		,,	G. J. Way ...	Vrede.
		,,	G. Star ...	Lennoxton.
		,,	R. S. Miller ...	Goloch.
		,,	C. G. Palmer ...	Dry Cut.
		,,	W. L. Jee ...	Lennoxton.
		,,	J. Davidson ...	,,
		,,	A. J. Debenham ...	Knowsley.
		,,	G. Wood ...	Heron's Court.
		,,	A. D. Uys ...	Horn River and Mooi Krantz.
		,,	T. Ferrier ...	Henley.
		,,	G. Jackson ...	Try Again.
		,,	W. Richards ...	Tweefontein.
		,,	W. E. Few ...	Erin & Imbezana.
		,,	Blizzard ...	Ingogo.
		,,	W. Short ...	Potter's Hill.
		,,	J. Matthews ...	Shakespeare.
		,,	G. Brown ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	R. S. Armitage ...	Boschhoek.
A. S. Parkinson ...	New Hanover ..	Lungsickness	E. Boast ...	The Avenue, York.
A. Hair	Umgeni and Borough of Pietermaritzburg	,	J. Neden ...	Wilgefontein.
		,,	Anea & Latcham	Plessis Laager.
J. Chaplin ...	Klip River	,,	Discharged Transport Cattle	Matowan's Kop.
		,,	A. H. Spring ...	Reserve.
		,,	A. Armstrong ...	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ...	Grobblar's Kloof.
		,,	Natives ...	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,,	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Lungsickness	Pepworth & Reid	Reitfontein
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein
		,,	J. Peniston ...	Reserve
		,,	J. Van Whye ...	Ladysmith T'Lands
		,,	G. J. Heslop ...	,,
		,,	H. E. K. Anderson	Gedula.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	G. F. & J. Woodhouse	Davel's Hoek.
		,,	Natives ...	Georgina.
		,,	G. J. McDuling ...	Waterford.
		,,	Natives ...	Langverwacht.
		,,	,,	Vertrek.
		,,	Nondo Gama ...	F. J. Dewaals' farm.
		,,	A. Boers, & Native	Marais Vel.
		,,	W. Neizel, & Natives	Roosboom.
		,,	Natives ...	Doornkraal.
		,,	E. Walker ...	Doornkloof.
		,,	J. Umpbleby ...	Springfield.
		,,	F. N. Nel ...	Catherine.
		,,	Natives ...	Macpherson'a farm.
		,,	P. Ruiter ...	Ladysmith.
		,,	Mdhlondhlo ...	Blaaubank.
		,,	Jobisa ...	Lombard's Kop.
		,,	Nosubala ...	Weltervreden.
		,,	H. E. K. Anderson and others ...	Dewdrop.
		,,	Nondabola ...	Zwaart Kop & Dew Drop
		,,	— Sandals ...	Home Farm.
		,,	Natives ...	Jonono's Kop.
		,,	B. G. Zietsman ...	Bosberg.
		,,	Natives ..	Roodepoort.
		,,	W. Cochrane ...	S. Wiltshire's farm.
		,,	J. de Jongh & Natives ...	Potini Spruit.
		,,	Natives ...	Reit Kuil.
		,,	A. S. McHattie ...	Wessel's Nek
		,,	Cory & Long ...	Ladysmith T'Lands
		,,	Henderson ...	Weltervreden & Paarde Vort.
		,,	Scomber ...	Kleinfontein.
		Scab	J. H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson ..	Walker's Hoek.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	G. Wetherill ...	Walker's Hoek.
		,,	A. Krogman ...	Brakfontein.
		,,	M. W. Krogman...	Dreifontein.
		,,	P. Marais ...	,,
		,,	H. Boers ...	Dew Drop.
		,,	G. Spearman ...	Feir View.
		,,	J. Van Reenen ...	Wessel's Nek.
		,,	A. Boers ...	Marais Vel.
		,,	A. Carbutt & J. Gocd	Matiwaan's Hoek.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Scab	Sparks Bros. ...	Ladysmith.
		,,	J. de-Waal ...	Blaubank.
		,,	F. J. de-Waal ..	Lombard's Kop.
		,,	G. Innes ...	Eland's Laagte.
		,,	J. Umpleby ...	Springfield.
		,,	A. J. Taylor ...	Arnot Hill.
		,,	R. Horsley ...	Warrock.
		,,	Dr. Helps ...	Roosboom.
		,,	Corrigel ...	Koolfontein.
		,,	W. Nezel & Natives	Roosboom.
		,,	Cockrane & Illing	Dansekraal.
		,,	J. Dryer ...	,,
		,,	J. Dryer ..	Aller Park.
		,,	H. S. Bowers ...	Zaaifontein.
		,,	A. Henderson ...	,,
		,,	A. Henderson ...	Eenvogle Vlei & Elandslaagte.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	H. F. Pearson ...	Everton.
		,,	W. Caldwell ...	Stamford Hill.
		,,	Natives ...	Unini Location.
W. Freer ...	Upper Tugela ...	,,	W. Freer ...	Acton Homes.
		,,	Borbasee ...	Vrom Draai.
		,,	S. Sharratt ...	Klein Waterfall.
		,,	Natives ...	Green Point.
		,,	A. H. Coventry ...	Earthcote.
		,,	Mdhlenjana ...	Mooi Hoek.
		,,	P.W. Dept. ...	Acton Homes.
		Scab	J. M. Wales ...	Fairleigh.
G. Gielink ...	Zululand ...	Lungsickness	M. Titlestad ...	Ntingwe.
		,,	Dinizulu ...	Hlabisa District.
		,,	Noiwana ..	Nqutu.
		,,	Natives' Cattle ...	Melmoth.
		,,	Sebambindoda and Natives ...	Kwamagwaza.
		,,	G. Havemann ...	Insuzi.
		,,	Military Loot Cattle	Warbeck, Elizabeth, and Barneveld, Melmoth.
		,,	Damusa ...	near Melmoth.
		,,	Ndabazeywana ...	Nqutu.
		,,	Strachan ...	,,
		,,	Jacob ..	Vant's Drift.
		,,	M. Bube ...	,,
		,,	Surrendered Boers	Hlabisa.
		,,	Lufahla Usutu ...	Nqutu.
		,,	F. W. White ...	Melmoth.
		,,	J. G. Vanderwes-thuyse	Ukandhla.
		,,	G. Muller ...	Near Melmoth.
		,,	C. Green ..	Inyoni.
		,,	Liversage & Van Rooyen ...	Umhlatuzi.
		,,	Surrendered Boers	Eshowe.
		,,	Mtantana ...	Telezi Ridge, Nqutu
		,,	Mhlamb ...	Sihlunegwana Hill.
		,,	Dr. Case ..	Eshowe.
		,,	Sub-Inspr Lewis, NI	Melmotq.
		,,	Surrendered Boers	Port Durnford.
		,,	H. T. James ...	Prospect.
		,,	J. Fry ...	Nkandhla.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
G. Gielink ...	Zululand ...	Lungsickness	M. Van Rooyen ...	Mahlabatini.
		,,	Res. Magistrate ...	,,
		,,	Sgt. Evans, N.P....	,,
		,,	P.W. Dept. ...	Eshowe.
		,,	F. A. Ortlepp ...	Saxony.
		,,	A. Barklit ...	Nqutu.
		,,	Military Cattle ...	Eshowe.
		,,	B. Green ...	Inyoni, Umlalazi
		,,	W. Magee ...	Mlalezi, Eshowe.
		,,	Pietekatonga ...	Nqutu.
		Scab.	Surrendered Boers	J. R. Ortlepp's farm
A. Klingenberg ...	Umsinga ...	Lungsickness	W. Pretorius ...	Warnbeck.
		,,	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
		,,	Combrink Bros. ...	Uithoek.
		,,	Mrs. H. Strydom...	,,
		,,	Ngobazane ...	Vermaak s Kraal.
		,,	Usiquantjee ...	Emsita.
		,,	A. Müller ...	Pression and Buffalo Home.
		,,	M. Shebele ...	Freiburg.
		,,	Dr. J. Dalzell ...	Gordon Memorial M.S.
		,,	H Stegen & Natives	Craigneathen.
		,,	H. Dedekind ...	Buffalo Home.
		,,	T. Keyter	Pomeroy Town Lands.
		,,	T. Crooks	
		,,	Botha	
		,,	Westbrook Bros.	
		,,	N. Smit ...	Tugela Ferry
		,,	J. Benecke ...	Stone Hill.
A. J. Marshall ..	Dundee ...	,,	Marshall Bros. ...	Cleveland.
		,,	— Haynes ...	Sterkstroom.
		,,	Military Authorities	Maypole.
		,,	Glutz ...	Rocky Glen.
		,,	Thorn ...	,,
		,,	Natives ...	Craigieburn.
		,,	J. Landman ...	Boschfontein.
		,,	J. Davidson ...	Beacon Hill.
		,,	Natives	Long Land.
		,,	,, ...	Carolina.
		,,	,, ...	Renier.
		,,	L. Hedder & May	Roadside.
		,,	Natives ...	Kelvin.
		,,	,,	Uitsay.
		,,	A. Jansen ...	Sheepridge.
		,,	Natives ...	Navigation Colliery.
		,,	F. Payne ...	Glencoe.
		,,	N. Glutz ...	Swiss Valley.
		,,	J. W. Dupreez ...	Jackalsfontein.
		,,	C. F. Van Rooyen	Davelsberg.
		,,	Lyle & Sangster...	Dundee.
		,,	Charley ..	Woodlands.
		,,	Umzagaza ..	Morgenstont.
		Scab	A. Jansen ...	Sheepridge.
		,,	J. H. Erkland ...	Carolina.
		,,	F. J. deWaal ..	,,
		,,	J. H. Reis ...	Longfontein.
		,,	J. W. Dupreez ...	Jackalsfontein

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ...	Dundee ...	Scab	D. Opperman ...	Gedull No. 2.
		,,	M. J. Herbert ...	Vermaak's Kraal.
		,,	H. J. Hearn ...	Hatting Spruit.
		,,	Gouws Bros. ...	Kelvin & Kilburne.
		,,	N. Glutz ...	Swiss Valley.
		,,	C. F. Van Rooyen	Davelsberg.
		,,	Maritz & Thornhill	Aletta.
		,,	W. V. Marshall ...	East Lynne.
		,,	P. J. Gouws ...	Uitflucht.
		,,	H. Harris ...	Sterkstroom.
		,,	W. Stafford ...	Sutherland.
W. A. Hutchinson	Alfred ...	,,	Nqubu ...	Location.
		,,	Ngihla ...	St. Mary's.
		,,	Makubana ...	Amaci Location.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness Scab	Natives ...	Hungerspoort.
		,,	G. Spearman	Woodlands.
		,,	J. H. Beyers ...	Doveton.
			A. J. Harding ...	Zwart Kop.
E. Varty ...	Umvoti—Western Portion	,,	J. M. & J. C. Van Rooyen ...	Pampoennek,
G. N. Perfect ...	Umvoti—Eastern Portion	,,	Thos. Hill ...	Stolzenvels.
		Rinderpest	Natives Cattle ...	Sobuza's Location.
F. E. Van Rooyen...	Kranzkop ...	Scab	L. J. Potgieter ...	Broedershoek.

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand have been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
17th July, 1901.

M. J. HIME,
for P. V. Surgeon.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc: 37, 1900. For the months of May and June, 1901.

Date.	Description.	Quantity.	Imported from.	Ship.	Remarks.
1901.					
May 8	Ornamental Trees	1 Case	London	Umfuli	Free of Pest.
,, ,,	Apples	200 Cases	Melbourne	Moravian	,, ,,
,, 10	Holley Trees & Shrubs ...	2 ,,	Southampton	Norman	,, ,,
,, ,,	Seed Potatoes	176 ,,	Melbourne	Induna	,, ,,
,, 11	Seed Potatoes	150 ,,	London	Umbilo	,, ,,
,, 29	Apples	100 ,,	Melbourne	Australasian	,, ,,
,, ,,	Seed Potatoes	50 ,,	,,	,,	,, ,,
,, 15	Grape Vines	A Quantity	Cape Ports	Umbilo	Landing disall'wed
,, 30	Ornamental Shrubs... ...	1 Case	Melbourne	Australasian	Free of Pest.
June 7	Apples & Pears	1,090 Cases	Adelaide	Blackheath	,, ,,
,, 8	Potatoes	27 Bags	Melbourne	,,	,, ,,
,, ,,	Apples	850 Cases	Adelaide	,,	,, ,,
,, 10	Grapes	115 ,,	,,	,,	,, ,,
,, ,,	Apples	171 ,,	,,	,,	,, ,,
,, 18	Potatoes	4,395 ,,	Melbourne	Sophocles	,, ,,
,, ,,	Apples	469 ,,	,,	,,	,, ,,
,, 20	Rhubarb Plants	1 ,,	,,	,,	,, ,,
,, ,,	Fruit Trees	3 ,,	,,	,,	,, ,,
,, ,,	Ornamental Plants	1 ,,	London	Inanda	,, ,,
,, ,,	Ornamental Plants	1 ,,	,,	Vladimir	,, ,,
				Sawin	
,, ,,	Apples	200 ,,	Port Jackson	Norfolk	,, ,,

C. B. JONES, Examining Officer, Durban.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of June, 1901.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1900.	Total for same per'd from July 1st, 1899.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	73·8	55 0	86·2	43 2	2·80	9	0·93	27th	45·67	25·90
Stanger	75·9	52·4	88·0	43·0	1·56	13	1·01	27th	38·54	21·90
Verulam	75·1	51·3	89·0	45·0	2·19	9	0·83	27th	40·77	24·27
Greytown	79·4	40·9	86 0	37·0	0 23	2	0·20	27th	29 72	22 89
Newcastle	70·3	38·3	79·0	28 0	0·00	1	0·00	10th	38 21	...
Estcourt	69·3	33·1	78·0	27·0	0·15	2	0·10	25th	29·84	25·30
Port Shepstone ...	71·3	61·7	83·0	52·0	4·80	8	2 30	28th	43·75	38·40
Umzinto	78·0	50·3	85·0	46 5	5·92	8	1·45	27th	39·73	29·37
Richmond	69 2	44·1	80·0	37·0	0·44	2	0·25	1st	31·94	33·51
Maritzburg ...	72 7	42 1	83·0	35·0	0 17	2	0·17	27th	32 59	28·96
Howick	69·9	34·9	81·0	28·0	0 44	4	0 30	24th	25·07	26·69
Dundee...	75 0	35·8	81·0	30 0	0·06	1	0·06	28th	...	...
Weenen	72·1	33·7	80·0	27 0	0 04	1	0 04	25th	27·48	20·17
New Hanover ...	68 9	40·3	85·0	30·0	0.33	5	0·23	27th	34 84	28·82
Hillcrest	68·7	52·4	83·0	44 0	1 46	8	0·81	28th	37·45	...
Mapumulo ...	76 1	49·2	87·0	40·0	1·67	7	1·28	28th	36·52	29 27
Hlabisa	67 8	54·0	79 0	45 0	2 00	6	0·55	11th		...
Melmoth	73 4	40·8	88·0	40 0	1·62	10	0·59	28th	33 37	...
Ubombo	66 8	53·5	73·5	44·0	2 08	11	0·67	11th	34 72	...
Eshowe...	7 5	52 0	8 0	43·0	2·73	5	1 52	28 h	1·77	...
Nqutu ...	6 8	43 5	78 0	32 0	...	...		...	...	...
Point	...		...	...	3·35	9	1·50	21st	38 06	25·72
South Coast Junction	...	...	.	...	3·68	8	1 68	27th	...	...

OTHER STATIONS.

Estcourt	...	...	71	22	0·25	1	0·25	25th	31·12	26·86
Nottingham Road ...	...	...	...	...	0 70	4	0·28	25th	...	...
Adamshurst		...	72	38	0 36	3	0·24	28th	27·46	
Hilton	...	...	77	32	0·18	3	0·12	28th	32·67	36·29
Ixopo (Gorton) ...	...	...	72	42	16	2	0 13	28th	13.40	21·31
Mid Illovo (Isment)...			76	41	3 35	7	0 95	27th	40 41	27·53
Ottawa	...		.	...	1·92	9	0 85	28th	41·79	25·35
Mount Edgecombe ...	...	...	86	49	1·8	8	0·93	28th	47 30	20·18
Cornubia	...		...	...	2·0	...	...	...	52·47	25·84
Milkwood Kraal ...	...	...		...	1 75	...	...	...	33·91	20 91
Blackburn	...	...		...	1 75	...			41·05	25·23
Saccharine	...	...	...	...	1 90	...	...	...	46·67	30·40
Prospect Hall... ...	...	...	...	...	2·91	...	...	...	9·98	..
Clairmont	...	...	...		3 89	6	1·9	28 h	48·58	
Equeefa		...	88	50	2 85	7	1·72	28th	40·66	26·92
Umzinto (Buneva) ..	...	...	...	..	2·66	2	1·71	28th	35·99	29·28

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of June, 1901 :—

Name of Colliery.	Labour Employed. Above Ground. E.	N.	I.	Below Ground. E.	N.	I.	Coal raised. tons.	cwt.
Natal Navigation	*12	49	124	9	330	117	10,602	9
Elands Laagte	11	19	130	9	132	245	8,340	0
Natal Marine	10	123	20	6	312	3	8,110	0
Dundee Coal Coy.	10	20	109	11	283	169	7,900	10
St. George's	10	101	20	6	185	0	4,704	0
Natal Steam Coal	4	61	12	3	143	5	2,750	0
Newcastle	3	9	12	4	104	0	1,163	0
Crown	10	†55	6	2	60	0	655	0
Inkunzi	2	12	0	1	49	0	632	14
West Lennoxton	1	6	4	1	0	27	160	0
East Lennoxton	1	0	8	1	0	20	150	0
Hillside Colliery	—	—	—	1	4	0	26	0
Total	74	455	445	54	1,602	586	45,193	13
Corresponding month (1900)	66	176	205	27	426	362	13,481	6

*Over and above these there were 7 Europeans, 26 Natives, and 31 Indians employed on shaft sinking, and other unproductive work.
†Mostly employed on construction work.

Mines Office,
July 10th, 1901.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of June, 1901 :—

	tons.	cwt.
*Coal Bunkered	22,307	15
Coal exported to Cape Colony	2,789	18
Beira	140	17
Total shipped	25,238	10

*Included in this item are 2,185 tons 16 cwt. of Imported Coal.

GEO. MAYSTON,
Collector of Customs.

A Means of Renewing Water in Tanks.

J. BLUNDELL, Bingara, writes to the *Agricultural Gazette* of N.S.W. :— I should like to direct the attention of such of your readers as are dependent upon galvanised-iron tanks for their household water supply, to a simple and inexpensive device whereby the quality of that supply may be much improved. Instead of the usual straight over-flow slip inserted at the top corrugation of tank, get a length and elbow of 2 or 3 in. down pipe. Solder the elbow to pipe, cut pipe to length to reach bottom of tank, allowing half an inch to turn up, then cut two quarters 2 or 3 inches deep out of bottom of pipe and turn up ½-inch lip on remaining quarters. Place pipe inside tank, pass the elbow through aperture occupied by the usual over-flow. Solder elbow in its place and solder lips to bottom of tank, and the job is complete. Cost, including pipe and labour, 2s. to 2s. 6d. The water entering at top of tank will force the water from bottom of tank up the pipe, and when the tank is over-flowing you have the satisfaction of knowing that the stale water is flowing out and the fresh retained as surely as if you ran off the lower water from the tap.

Possibly, this device may be in use in some parts, but, I think, not generally, and I have never seen it attached to any tanks but my own.

Favus in Poultry (Tinea Favosa.)

THE following is a Board of Agriculture (England) leaflet on Favus in poultry :—Favus is a disease produced by a minute parasitic fungus known scientifically as *Achorion Schoenleinii* (Remak). This fungus attacks the comb, wattles, and neck, etc., of birds, and causes the feathers of the latter to fall off ; sometimes one side only of the neck may be affected, becoming quite deplumed, whilst the other shows no signs of invasion ; but, as a rule, it is the comb that suffers first and most from the attack.

Tinea favosa is common to man, the cat, dog, and rabbit, and is particularly prevalent in rats and mice. It is rarely met with, however, in human beings in England.

It is very destructive in poultry yards, and, being highly contagious, often spreads with great repidity. A single diseased cock soon contaminates the whole run, and several outbreaks have been traced to a new male bird from an affected yard.

The first signs of an attack of favus are small, pale, irregular, cup-like spots on the comb or wattles, generally appearing on the comb first. These spots grow together, and sooner or later form a confluent covering of a dirty yellowish-grey substance, which is often arranged in concentric layers. These crusts often grow to a considerable thickness. When they are present on the comb or wattles there may be a complete and rapid disappearance of the malady ; but when the feathered areas become invaded it is more persistent. Sometimes the breast, and especially the rump, is denuded by this fungus, which, when present on the feathered parts, usually ends fatally unless treatment is resorted to. The feathers become erect and dry and fall off, and leave the denuded skin covered with dull yellowish grey crusts, showing here and there depressions from which the feathers have fallen. The fungus may easily be observed by scraping the diseased surface of the skin under the crusts, and examining the *debris* under the microscope. It will then be seen to consist of a number of fine threads (the mycelia), and numerous spores, sometimes nearly the whole mass being composed of the latter. To examine the fungus, the *debris* from the skin and crusts should be put on a slide, and then moistened with distilled water and a little acetic acid.

Nearly all breeds seem equally susceptible, but the disease does not appear to have occurred in Indian Game ; it is said that fowls of Cochin China descent are most liable to it.

Care should be taken in handling patients, as the disease can be transmitted to man, on whom it is not so amenable to treatment as in birds. It is probable, however, that the disease can only be planted either naturally or artificially on an abraded surface.

Treatment.

The treatment consists in bathing the invaded parts with warm water and soft soap, and then applying some ointment to destroy the parasite. Nirate of silver well rubbed into the comb and wattles has been found of great benefit ; an ointment of 5 per cent. of the nitrate of silver in lard may be used for this purpose. Red oxide of mercury one part, to lard eight parts, has proved an excellent remedy if used for several days. A correspondent of the Board of Agriculture advises "powdered zinc, copper, and iron rubbed on the damp comb." *Thymol* has also been mentioned as a possible remedy for favus, as it has been used successfully in treating ringworm, a somewhat similar parasitic disease in the human subject.

In any case it is most essential to well foment the diseased parts previously to applying the ointment, and to remove as far as possible all the favic crusts with a blunt knife. One cannot be too careful in examining a fresh bird before turning it into the run, which, needless to say, should not be done if any signs of "favus" are noticed upon it.

Should the disease appear, the bird should be at once isolated and treated, as when the parasite reaches the feathered tracts is it so much more difficult to eradicate.

Gleanings.

A cow is different from a child, in that she can never be spoiled by too much petting. Speak softly, milk gently, and she becomes at once your profitable friend.

Pig manure is valuable for all crops, either alone or mixed with other stable manure. It can usually be handled to better advantage mixed, as it is considered rather strong for some crops when used alone in a liberal application.

A Chilian military journal (the "Revista de Cabballeria") gives an account of a long-distance ride recently accomplished by a party of Chilian cavalry officers which is interesting, as showing the endurance of horses of purely Chilian breed. Twenty-one officers took part in the ride, mounted on their ordinary chargers. On the first day 81 miles were accomplished; a like distance on the second; and on the third 88 miles, making a total distance of 250 miles in three days. The route lay along very bad roads, over a mountainous country, a height of over 3,000 feet above the level of the sea being reached.

Fruit-trees, economic plants, shade, and timber trees are largely grown in the Government Gardens at Jamaica for distribution amongst the settlers in that island. A few kinds are given away gratuitiously, but for most of the kinds, such as plants of coffee, cocoa, nutmeg, kola, croton, indiarubber, sarsaparilla, balsam of Peru, coca, lace bark, dragon's blood tree, and numerous others, the small charge of ½d., 1d., and 2d. each is made, packed and delivered at any railway station or port. Citrus trees and plants generally, which may be obtained at private nurseries, are not to be had from the public gardens.

When killing a pig it is best to stun it before sticking it. Take an axe or a hammer, and give it a knock on the forehead; it saves a lot of trouble. Have the pig lying on the right side, catch hold of the foreleg, pull the pig forward, point the knife straight for the tail, drive the knife forward, then turn the knife a little up and downwards, that will cut the blood vessels, and the pig will bleed all right; but have a knife with a straight point for sticking. As soon as the water is boiling and ready for use, put a little cold water in it. If there is no trough, lay some straw on the ground, lay the pig back upwards, the feet underneath, put a bran bag over it, keep the bag well on the pig, pour the water on the bag. That way you can do with less water, and it scalds better. Start at the head first, and move the bag as you go on. When all the rough work is done, lay the pig on a box, or hang it up at once, pour some cold water on it, and wash it well off. Then have a good knife, and anything that is left will be removed easily. A good knife is half the work, and will make a clean job.

For egg-stealing dogs, blow out the contents of an egg, fill up with ammonia, seal up with beeswax, cleanse the outside of the shell, place it in the nest with a good sound egg, and await developments. If that dog steals another egg nothing but death will cure him of the habit.

The State Entomologist of Georgia, U.S.A., since March, 1898, has caused to be dug up and burned 300,000 trees, which were infested with the San Jose scale—most of them so badly that they were beyond recovery. Last autumn a nurseryman in Tennesse began to ship trees into Georgia which were covered with the scale. He was warned not to ship, but presisted in doing so. As a result, 30,000 of his trees were seized and burned. This nurseryman threatened to bring suit for the destruction of his property. The case was submitted to the Attorney-General, who decided that the State Entomologist had the right to destroy such infested stock, and that it was his duty to destroy it. That ended the case.

Professor Clinton D. Smith, after five years investigation of the milk question, publishes the following conclusions:—"First—A cow yields as rich milk as a heifer as she will as a mature cow. Second—The milk is as rich in the first month of the period of lactation as it will be later, except perhaps during the last few weeks of the milk flow, when the cow is rapidly drying off. Third—There is little difference in seasons as to the quality of the milk While the cows are at pasture the milk is neither richer nor poorer on the average, than the milk yielded when the cows were on winter feed. Fourth—The milk of a fair-sized dairy herd varies little in composition from day to day, and radical variations in this respect should be viewed with suspicion."

One of the strangest fads ever taken up by civilized people is surely the eating of raw flesh. The "National Provisioner" has the following on this subject:—The raw meat cranks are in dead earnest. They think that raw food is the manna of heaven. So convinced is Prof. Byron Tyler of this fact that he has stuck the following sign over his room in the Grand Central Hotel, Chicago:—"Chicago Raw Food Society. Restaurant No. 1. Meals at all hours. Service a Specialty." The professor is customer No. 1. He was a telegraph operator and a physical wreck. His present health, he says, is due to "eating food as it is prepared by nature." That induced him to turn his hotel room into a "raw food restaurant." The following is the average menu of the 'Raw Food Restaurants":—Oysters on the shell, celery, radishes, olives, clam juice, raw steak, cold slaw, Waldorf salad, cheese, nuts and raisins, pressed wheat, crackers, figs and oranges. Nothing is cooked. The steak is chopped and mixed with celery and onions.

Plant Moisture.

IN his agricultural column of the *Manchester Times* Mr. James Long writes :—

Reference has been made to the value of mulch in order that loss of moisture may be prevented, and that plants may be abundantly supplied with all that they require. How much, then, do plants require ? Mr. Maxwell has taken the trouble to ascertain by one set of experiments how much moisture transpired through the medium of three pieces of sugar-cane. Two tubs were selected, each with perforated bottoms; over each bottom a piece of cloth was laid, and this was followed by 125lb. of a selected soil, the cloth being employed to prevent any loss of the soil through the perforations. The two tubs were placed in galvanised iron pans of water, which was regularly maintained at a given level. The pans were covered with glazed cloth, which was moisture-proof, for the purpose of preventing evaporation from the surface of the water, so that all water lost by evaporation would have to take place through the surface of the soil, and by transpiration from the plant. In one of the tubs three pieces of the seed cane were planted, while the other was left just as it was, and maintained as a check. The two tubs were placed in a position with a southern exposure in the face of a strong wind, but they were covered by a verandah to prevent the acquisition of water by rain. The two tubs were maintained in this way for 7¼ months, and it was then found that the water which had evaporated from the tub in which no plants had been placed reached 83,140 grams, whereas the water evaporated from the other tub through the medium of both soil and plants was 167,250 grams. Thus it was shown that the water transpired by the cane was 84,110 grams. The total amount of dry matter produced by the plant during the period of growth was 568.9 grams; for each gram of water-free cane material produced 147.8 grams of water were transpired. Mr. Maxwell points out that the application of the same volume of water at the time of planting and during the early period of growth, when transpiration is very low, as is required by a plant later in development is followed by a great loss of water and of the soil constituents which the water removes. These facts bear indirectly, and directly too, upon water meadows and general irrigation, and the experiment furnishes many hints which may prove serviceable to both instructors and investigators in this country.

The Udder.

PROFESSOR H. HAYWARD says :— Doubtless you all know that the productivity of an udder is dependent upon the number of epithelial or secretive cells it contains, and not necessarily upon its size. The ideal udder then would be one of such a shape that the maximum-sized udder containing the maximum number of secreting cells could be easily carried when full. A little thought will show us that the shape of the udder must necessarily form part of an arc of a circle, but that both the back and front part of the udder will extend beyond the circle, and thus form what we know as a square, well-balanced udder. The udder should, of course, be free from much flesh. The amount of flesh an udder will show on milking out, however, will depend on the period of lactation, as the more active the secretive cells are, the more apparent flesh will the udder show after milking. A fleshy udder is readily distinguished by the fact that superfluous flesh that it contains usually seems to drop more or less to the bot-

tom of the udder, making it pendulous. Such an udder not only is unsightly, but the cow with such an udder is quite likely to transmit this undesirable quality to her offspring. The most common fault found in the udder is the imperfect development of the front udder. This is often seen in a very marked degree in certain families, or sometimes whole breeds.

I believe the lack of development in the fore-udder is the cause of a large aggregate loss to the dairymen of our country, and that it is well worth while to at least make the effort to overcome this fault, which is so common in our dairy cows. To give some idea of the great difference between the quantity of milk produced by the front and rear udder, I quote the results obtained by Professor Plumb in some studies of the udder, which he made a few years ago. In 226 different lots of milk obtained from 65 different cows, representing several types of udders, he found that the average yield of the 226 front udders was 4.1 quarts, while the average yield of the 226 rear udders was 4.9 quarts, or a difference of over 16 per cent. It should be borne in mind that these were average udders, and not udders noticeably deficient in one part or the other.

To note the effect when the front udder was noticeably undeveloped, the same observer took 13 cows that had a more or less inferior front conformation, and weighed separately the milk produced by the rear and front udders. In these cases it was found that the rear udder produced 57 per cent. more milk than the front udder, which plainly shows the difference existing in different types of udders. Professor Plumb further noted the difference in the yield of the front and rear udders, where the udders were well balanced. In the nine cows studied, it was found that the difference in the milk yield of the front and rear udder amounted to only 4 per cent.—a comparatively insignificant difference.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—Market is somewhat weaker than it was a fortnight back.

Mealies.—Although 11s. to 11s. 6d. per muid was the average for mealies a fortnight back, on the market this morning 10s. 4d. per muid, including sack, was only fetched; and several mornings lately mealies have only realised about 10s.

Forage.—This article is very scarce, and prices have fluctuated between 6s. 6d. and 9s. 1d. per 100lbs.

Hay.—Whilst some samples have been as low as 1s. 9d. per 100lbs, others have reached 4s. per 100lbs. Bedding from 7s. to 28s. per load.

Potatoes.—Some samples have only realised 5s. 3d. to 8s. 3d. per 100lbs. These, as may be expected, have been inferior; good samples have reached from 15s. to 17s. 6d. per 100lbs. Sweet potatoes 5s. to 5s. 6d. per sack.

Beans.—From 8s. 6d. to 16s. per 100lbs.

Onions.—From 16s. 8d. to 37s. 6d. per 100lbs.

Pumpkins.—From 3s. 6d. to 6s. 9d. per dozen.

Poultry.—Fowls from 2s. to 9s. 6d. each ducks, from 6s. 6d. to 11s. 3d. per pair; turkeys (cocks) 18s. to 26s. 6d. each, (hens) 6s. 6d. to 7s. 3d. each.

Butter.—From 1s. 3d. to 2s. per lb.

Eggs.—From 1s. 7d. to 2s. 7d. per doz.

Vegetables. — Cabbage, carrots, cauliflower, lettuce, onions, beans, peas, celery, potatoes, and turnips have been disposed of daily.

Fruit.—Apples (imported), bananas, lemons, naartjes, oranges, papaws, and pineapples, constitute the varieties sold.

Sundries.—Beef, 8d. to 9d. per lb.; mutton from 6d. to 9d. per lb.; pork, from 4d. to 9d. per lb.; also a quantity of fresh fish disposed of daily.

Wood.—From 6½d. to 1s. 1½d. per 100lbs.

Agricultural Show.

New Hanover, Wednesday, July 24th. Secretary, H. A. Light, York.

The Agricultural Journal

AND MINING RECORD.

VOL. IV. FRIDAY, AUGUST 2, 1901. No. 11.

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Reading Cases for holding a year's issues of the "Agricultural Journal," leather back, cloth sides 26 strings, lettered on side, 1s. 6d. each. Binding yearly volumes in cloth, 4s. each.

CONTENTS.

Rinderpest.

(By H. WATKINS-PITCHFORD, F.R.C.V.S.)

NO further extension of this disease has occurred in Umvoti County. Reports continue to be received from various quarters, announcing cases of suspicious nature, but upon investigation these prove to be without foundation, and indeed would have attracted little or no notice had not the owners become apprehensive, by reason of the recurrence of the malady in our midst.

The reports received from the Orange River Colony are reassuring, and the disease is reported as being still confined within the original quarantine area. The losses amongst these recently inoculated cattle (now numbering nearly ten thousand) have been less than five per cent., confirming, thereby, the estimate which was formed some five years ago as to the safety and utility of the serum method of treatment.

One Line Railway.

PEARSONS' MAGAZINE" for February, 1899, contains an interesting article on mono or single line railways. The writer claims that these railways are more economical, much safer, more easily built, and less costly to maintain than the ordinary light railway with double track in all countries where natural difficulties have to be sur-

mounted. In many parts of the world they have been constructed, and they have been worked with great success. For transporting agricultural produce a light description may be worked by hand, while with steam or electric power and built on a more substantial scale, they are suitable for running trains at speeds of 100 miles an hour and over.

Paspalum Dilatatum.

IT is perhaps desirable to further impress the necessity of moisture in the cultivation of paspalum dilatatum upon those who are preparing to raise this grass. If moisture is absent after the sowing of the seed, failure will be inevitable. It is therefore imperative that the seed-bed (if this, and the preferable system of planting be elected), should be regularly watered if rainy weather does not follow the sowing.

Botanic Gardens, Durban.

HALF YEARLY REPORT.

THE report on the Botanic Gardens, Durban, for the half year ending June 30th is of exceptional interest, inasmuch as it contains a history of the institution from the time of its inception. The beginning was humble in the extreme. We read of a house to be erected for the curator, the cost of which is not to exceed £3. The absence of money is again indicated in the following extract from one of the early minute books :—"That, in lieu of salary, and to cover all expenses the Curator, Dr. Johnstone, be allowed to sell the surplus produce of the Gardens over and above what may be required as stock."

Mr. Wood, in the course of the Report, advocates the growing of saplings for walking sticks and umbrella handles. The British imports of these saplings in 1850 was but £1,600, whereas in 1886 the value had increased to £189,000.

Seeds of a new mango, "Deux-Doux," have been obtained. The fruit is said to be of superlative quality. The Herbarium now contains 26,758 specimens, of which 8,817 are South African. The Report, which shows the vitality in every respect of the institution, is well worthy of perusal by all who take an interest in the objects the institution is engaged in forwarding.

Irrigation.

COLONEL CORBETT, the Irrigation Expert, will complete his term of two years' service with the Natal Government about the middle of November. Anyone wishing to consult him should therefore apply without delay. No fee is charged for this officer's services. Application should be made direct to Colonel Corbett, Department of Agriculutre, Pietermaritzburg.

District Reports.

HOWICK, 29th July.—In matters appertaining to agriculture there is at present a lull, and consequently, therefore, there is not much to chronicle in that respect. As to the weather, it is somewhat different. Severe frosts have lately been experienced, with the result that the grazing for stock is in a very bad condition; there is absolutely no nourishment left in the veldt grass, and with the exception of farmers who are fortunate enough to possess bushes or forestlets on their lands which have now become recognised as a real and substantial advantage, not only on account of the good grazing provided by the bush grass and other succulent plants existing throughout the year, but also on account of the warmth afforded from the cold air at nights, those farmers who have no such benefits are obliged to resort to feeding to keep up the condition of their stock. This they have been in a good position to do, as the past season has provided hay which in quality and quantity has hitherto been unprecedented in this Division. One farmer at the Dargle lost a large quantity of hay a short time ago through a grass fire caused by the setting alight carelessly or wilfully of some grass by some Coolies working in a field. The Grass Burning Law being in force, it is to be hoped that, the offence and

punishment inflicted in this case being the first of its kind in the Division, other Indians, and also Natives, will take warning. Reverting to the frosts experienced, I may mention that on the nights of the 19th and 20th inst., 7 degrees of frost were registered, and the consequence was that water in taps and pipes above ground was frozen. Rain is badly needed, and it is the general prayer that it may not be long delayed now that the spring is soon coming on. All classes of stock in this Division are free from disease, as far as I know, with the exception of a few cases of scab amongst sheep.

J. W. CROSS, Magistrate.

IXOPO, 30th July.—During the past fortnight there has been one storm, accompanied by a little rain, and a few light showers, indicating the approach of an early spring. There have been several large grass fires with loss of stock. Unfortunately the farmers do not seem inclined to take advantage of the provision of Act 31 of 1895, and have the Grass Burning Act put into force. To do so, it is necessary for 15 landowners (erven holders excepted) to requisition the Magistrate to call a meeting to decide whether the Magisterial Division shall be brought under the provision of the Act. It is not generally known that in the event of a native deliberately setting fire, in contravention of this Act, that the said native could not be criminally punished, because the Act is not in force in this Magistracy; and to sue the native civilly, would probably be of little advantage, as the native would probably possess nothing, and the kraal head would not be liable for the misdeeds of a minor, or inmate of his kraal.

FRANK E. FOXON, Magistrate.

INANDA, 18th July.—June has passed away without incident of note in this Division. For the season of the year, the weather was very favourable. The following are a few particulars from the meteorological observations made here during the month:—Rain, 1.47 inches, which fell on seven days, the heaviest fall being 0.83 of an inch on the 27th; maximum temperature in the shade, 89 degs on the 1st; minimum, 45 degs. on the 28th; mean temperature for month 63.2 degs. The rain did a lot of good, as it was preceded by a long spell of drought, and crops were beginning to show signs of parching. The rain has, however, put matters right again, provided we do not have another too long dry spell, and I must say present appearances are in favour of the latter. During this month the weather has been very cold, and I hear frequently of frosts in the valleys, but not enough so far to have damaged cane. I regret to say that, just as the Division was considered clear of disease amongst stock, an outbreak of lung-sickness has been reported amongst a small lot of cattle belonging to an Indian farmer at Newlands. One has been killed, and the rest inoculated and placed under license. Otherwise stock is thriving in the Division. There is an epidemic of some kind amongst dogs, and I am informed that large numbers are dying all over the place One gentleman has lost twenty-one out of thirty-nine. Amongst human beings, after the severe epidemic of dengue, which has not yet quite disappeared, has come one of influenza, and I hear of a large number of people having been, or still are, laid up with it. It may not be generally known that a gentleman in this county, who is a scientific horticulturist by profession, has raised a new and very fine species or variety of orange, which he has decided to call the "Natal Victoria," the latter after our late Queen, with Natal prefixed to denote the country of its origin. I think the "Natal Mammoth" would have been a more appropriate name, as it is certainly a mammoth orange. It is without exception the most delicious orange I have ever eaten, has a flavour which is new and entirely its own. Some of the fruits have reached 25 oz. in weight, and measured 15½ inches in circumference. A little time since one twig was picked with four oranges on it, which turned the scales at 5¼lbs., the four, and this, notwithstanding that the tree had suffered severely from the drought last year, and has not yet quite recovered, and the size of the fruit, therefore, this season, not up to the usual average. The "discoverer" informs me that, given suitable soil, and a favourable season, the oranges will average at least 20ozs. The tree is quite distinct from all other oranges, very large with curly leaves, and the seedlings partake of the parent tree, proving it to be a really distinct orange from all others. It is a most robust and vigorous grower; a few grafted four years ago are now in full bearing. The gower has at present some 200 young grafted trees for disposal, and hopes to have 600 more by this time next year. Any person being desirous of obtaining young plants could do so by applying to me for the address. In the meantime I may state that I have seen and tasted the oranges, and can vouch for the above facts, and lest what I have said may be construed as a cheap advertisement, I would here add that I have written entirely on my own initiative, and for that reason am unable to give the name of the grower. At the same time, I consider it a public duty to make the orange known, in order that it may become largely propagated, and to give an early opportunity to those wishing to obtain trees to do so. I may also mention that the same gentleman has raised another distinct variety of orange, not so large, but a most splendid orange—as, however, it has as yet only borne fruit once this season, it is too early at present to do more than merely refer to it.

JOHN L. KNIGHT, Magistrate.

Port Shepstone Illustrations.

IN this issue will be found a supplement illustrating the "interview" by "Ergtaes" with Mr. Maydon, M.L.A., No. 5, Vol. IV.

Australian Tree Seeds.

SMALL quantities of 13 varieties of tree seeds selected by the Hon. F. R. Moor while in Australia are now available for free distribution to applicants. The following descriptions of the timber, etc., of the varieties are extracted from "Notes on the Commercial Timbers of New South Wales," by J. H. Maiden, F.L.S., etc., Consulting Botanist to the Departments of Agriculture and Forests :—

Ironbark.

Names.—We have four ironbarks, three of them of especial value. Timbers of this class are so important that it will be interesting to discriminate them. There is a good deal of confusion in regard to the local names given to ironbarks, and the names I suggest for the four species seem to me the least objectionable. At the same time the names "Narrow-leaved Ironbark" and "Broad-leaved Ironbark" are too cumbersome for ordinary use, and certainly for persons outside the Colony. It is probable that ironbark for the export trade will go forward under two names only, viz., grey ironbark and red ironbark, the first being the white or grey ironbark, and the second including both the "Narrow and Broad-leaved Ironbarks," the timbers of which closely resemble each other. The fourth ironbark, whose botanical name is "Eucalyptus sideroxylon," is mainly an interior species, and will seldom, if ever, be exported. Perhaps timber will go forward under the single generic name of ironbark ! if so, I wish to impress on friends at a distance that our various species of ironbark vary a good deal in colour, as a consignee may readily be confused if an ironbark be sent to him different in apparance to that to which he has been accustomed. Because of the great importance of ironbark, I proceed to deal with these timbers with a little more detail than with the other hardwoods.

Table of ironbarks.—The following table brings out the principal points in ironbark trees and ironbark timbers, and may help to elucidate them :—

	White or She Ironbark. (*paniculata*).	Narrow-leaved Ironbark. (*crebra*).	Broad-leaved Ironbark. (*siderophloia*).	Red Ironbark. (*sideroxylon*).
Colour (darkens with age).	Very pale ; pink when fresh.	Medium	Medium. A little darker than preceding.	Very dark.
Strength of timber	Best	Good	Good	Inferior.
Bark	Often pale-coloured, even grey. Furrows often anastomosing.	Very deeply furrowed, inferior in depth only (if at all) to *sideroxylon*.	Often of a flaky character.	Dark ; deepest furrowed.
Leaves	Narrow and medium ...	Very narrow	Very broad	Medium ; foliage often sparse.
Flowers	White	White...	White	Crimson ; sometimes creamy.
Fruits	Small	Very small	Rather large	Large.

How to tell ironbark.—It is not very easy, in a few words, to give a definition of ironbark. Of course, if the bark is available, the thing is simple enough, for most of the barks are characteristically

furrowed and rugged. To describe it we must take note of a variety of circumstances. It is heavy (almost the heaviest of our hardwoods). It is hard, as may be readily seen if it be touched with a plane, or a nail be driven (or attempted to be driven), into it. Its most characteristic property, however, is a certain "gumminess" in working, which is well brought out under the plane, and its horny texture. The result is that, when planed, ironbark shows the appearance of more or less parallel striae or lines of close-textured wood, strongly resembling horn, while between these, the wood has a more open grain, showing narrow pits which may be seen, even by the naked eye, to be filled with a substance of a resinous texture. In some specimens it is not easy, however, to make out these lines of horny-texture wood, but the resin-pits appear to be always present. Ironbark is more or less curly in the grain, consequently it often gives trouble to plane to a perfectly smooth surface. If a blunt tool be used, the ironbark tears in fairly regular blotches, while to get a perfectly smooth surface the wood often requires to be traversed with the plane, or even to be gone over with the steel scraper. Its hardness and weight often preclude it from use, perhaps an advantage, as otherwise the consumption of this timber would be inordinate.

Principal uses.—Ironbark is the king of New South Wales hardwoods, in fact it is not excelled in any part of the continent for combined strength and durability. It is extensively used in bridge-construction, for railway sleepers, for posts, for naves, spokes, shafts, and framing, by the wagon and carriage-builders; for large beams in buildings, particularly in stores for heavy goods — in a word, wherever great strength is required. For such purposes as railway sleepers, it will last an indefinite period, and in many cases has to be taken up, not because it shows signs of decay from exposure on the permanent way, or disintegration, because of the vibration to which it has been subjected, but because holes have been made in the sleeper by the renewal of bolts and spikes. I have specimens of sleepers which have borne the heaviest traffic of the main line near Sydney for twenty-five years, and which are as sound as the day they were laid.

White or Grey Ironbark (*Eucalyptus paniculata*, Sm.)

This is the ironbark usually called as above in the coast districts. It is, however, also called red ironbark in the Moruya and Wagonga districts, and other places.

The best white ironbark is very pale, the hardest of ironbarks, and cuts almost like horn; some of the same species from the Moruya district is of a medium red colour, not unlike Sydney blue gum in tint. It is to white ironbark of good quality that all the encomiums which have passed on ironbark may be attributed. At the same time, timber but little inferior may be produced by some of the other ironbarks.

Distribution.—It is rather common in the coast districts and mountain ranges. Northward it extends as far as the Tweed, and southward to near Bega, perhaps further.

Narrow-leaved Ironbark (*Eucalyptus crebra*, F. v. M.)

So called because of its narrow, slender, graceful foilage, the flower-buds, flowers, and fruits being quite small. At Dubbo this timber is called both grey and red ironbark.

This and the red (broad-leaved) ironbark may very well go together, as the timbers have much in common. They are of a deep red colour, of about equal hardness, and are really valuable timbers, although inferior to the best white or grey ironbark.

Distribution.—The narrow-leaved ironbark occurs principally on the eastern side of the Dividing Range, but at least as far south as Jervis Bay. It is common about Richmond, Wellington, also Dubbo to Narrabri. It is widely diffused, and a number of other localities could be given.

The Broad-leaved Ironbark (*Eucalyptus siderophloia*, Benth.)

Perhaps this is the most distinctive name for this species, a characteristic by which it may be readily distinguished,

particularly in young trees. It is often called "red ironbark," particularly from northern localities. This ironbark from the Clarence and further north is apt to shell and split on exposure, and hence is not liked for engineering purposes. As a general rule it is a really fine ironbark. It resembles the previous one in quality of timber.

Distribution.—Broad-leaved ironbark occurs from the Clyde Mountains in the south, along the coast ranges, to Queensland. Westward it is found as far as Wellington and Dubbo, also at Mudgee. Mr. Deane informs me that, with *E. crebra*, it is found from Dubbo to the north-western line.

Red Ironbark (*Eucalyptus sideroxylon*, A. Cunn.)

The wood of this is the deepest in colour, and also the softest and least valuable of the ironbarks. The tree is often pipy and gnarled, but in some places (*e.g.*, the Mudgee district) it is a fine timber tree. Where one of the other ironbarks is available, this ironbark suffers by comparison ; nevertheless, it is a useful timber, and is employed in public works for such purposes as railway sleepers and posts, where long lengths are unnecessary. Frequently good lengths cannot be obtained, and if they could, the tensile strength of this timber is not equal to that of the best ironbark.

Sometimes it is called "Mugga," and it has been regarded with unreasoning prejudice, instead of being judged on its merits. To call any timber by such a name as "Mugga" is to inflict an irreparable injury upon it.

Distribution.—Red ironbark is found principally in the auriferous districts of the western and south-western interior. It is generally found on poor, sterile ranges, and is usually unaccompanied by any other species of ironbark.

I have dealt with the question of distribution in speaking of individual ironbarks. But as regards the coast ironbarks, the most important commercially, it may be pointed out that they and spotted gum often grow together. The principal localities on the south coast are Bermangui, Red Head, Wagonga, Moruya, and the Clyde River. On the north coast we have Wyong, Ourimbah, Blue Gum Flat, Port Stephens, Cape Hawke, Manning River, Camden Haven, Port Macquarie, and so on to the Tweed.

Quantity available.—In spite of the reckless extravagance with which this timber has been cut, it is by no means scarce, especially in some localities, a few miles from the coast. While it is a very slow-growing tree, there is some consolation in the fact that it usually grows in barren, rocky country, unsuitable for agriculture, and therefore wholesale clearings are not made as is the case with many other timbers. At the same time it does not readily reafforest.

White Mahogany (*Eucalyptus acmenoides*, Schauer.)

Name.—This is a pale-coloured timber, which bears no resemblance either to the mahogany of commerce or to the red or forest mahogany of New South Wales. It gets its name because of its pale colour, and because the bark of the tree was thought to resemble that of the red mahogany. The name is in universal use in the Colony, and cannot now be disturbed.

Characteristics.—To say that it resembles tallow-wood a good deal, but that it is paler in colour, that it is not greasy, and harder than the better know timber, will perhaps give a good idea of it. It is one of the most durable timbers in New South Wales. I know of posts of it in different part of the Colony quite sound after the vicissitudes of more than half a century. It chief drawback is some tendency to shell off. Users of it assure me that it is far more durable than ironbark or box. It is a tough, strong, useful timber.

Principal uses.—I believe it will be found an excellent timber for woodblocks, but I would discourage exportation of it at present, except under close supervision, as I have known stringybark substituted for it, perhaps through inadvertence. Its hardness is a drawback, and the trees are sometimes unsound; but it is so good a timber that I would invite our timber

men to give more attention to it in future. It is one of those timbers which is not as well known as it should be, because it has been constantly confused with others. It is excellent for posts, piles, girders, &c., and is useful for general building purposes. It would be desirable to thoroughly test it for the decking of bridges.

Distribution.—North coast and coast mountain districts.

GREY BOX (*Eucalyptus hemipholia*, F. v. M.)

Name.—Because of its tough, interlocked character, which reminded the early settlers of Turkey box. Here, however, the resemblance ceases, as our box is a coarser-grained, duller-looking timber, while in the colonies it often goes by the name of "Box," the adjective "Grey" being used to distinguish it from red box, brush-box, &c.

Characteristics.—Its toughness, hardness, cross-grained, non-fissile character, and its great strength. It is a pale hardwood, of a very pale brown.

Principal uses.—It is used in the colonies for the naves of wheels and heavy framing, and for the cogs of wheels, large screws, mauls, handles, shafts, poles of drays, &c., which require a tough wood for their manufacture. In Victoria it is in high repute for railway sleepers, and in that colony and our own for piles, girders, &c. It can be recommended with confidence to railway-carriage builders and others who require a strong, durable timber for framing, &c.

Distribution.—Coast and coast mountain districts.

Quantity available.—Fairly abundant.

TALLOW-WOOD (*Eucalyptus microcorys*, F. v. M.)

Name.—Given because of its slippery, greasy nature.

Characteristics.—Of a canary-yellow (or sometimes reddish) colour when fresh sawn, drying to a pale brown. One of the least liable to shrink of all our hardwoods. It is heavy, strong, and durable. It may be planed and turned with great satisfaction. It is not easily split, the greasy substance contained in it making it a tedious matter to get the wedge to "draw." I would express the opinion that, after ironbark, tallow-wood is the most valuable of our hardwoods.

Principal uses.—For flooring, particularly in ball-rooms. For this latter purpose it is selected on account of its greasy nature. For decking, hand-railing, girders, and some other parts of bridges. A favourite for building work generally. It does not burn readily, which in buildings is, of course, a recommendation. It is perhaps the most valuable wood in New South Wales for paving-blocks. It makes admirable posts and rails, lasting an indefinite period either above or below ground, but difficult to split for these purposes, as already remarked. White mahogany is not infrequently substituted for tallow-wood. Both are good timbers, and can stand on their own merits. The substitution can readily be detected by any man with a fair knowledge of colonial timbers.

BLACKBUTT *Eucalyptus pilularis* Sm.)

Name.—Owing to the fibrous bark on the butt, which is of a dark-grey colour, even blackish, though its depth of tint is in part owing to bush fires

Characteristics.—Pale-coloured, more or less fissile, though sometimes quite interlocked in grain. It is a strong, durable, thoroughly safe and well-tried timber. It is usually readily diagnosed by the presence of narrow, concentric gum-veins, but sometimes these veins are nearly or wholly absent.

Principal uses.—This is one of the best hardwoods we have for house and shipbuilding. It is useful for bridge planking, though inferior to tallow-wood for that purpose. It has been tested for many years for blocks for wood-paving, with most satisfactory results; in fact, it is one of the best timbers we have for the purpose, both as regards wear and durability. It takes tar well. After ironbark, I would only place this timber second to tallow-wood, amongst our hardwoods, for general purposes.

Distribution.—Coast districts from north to south.

Quantity available.—Plentiful.

RED MAHOGANY (*Eucalyptus resinifera*, Sm.)

Name.—This is the timber called mahogany, because it reminded the early settlers of the Central American wood, which is, however, of much less weight than our timber. Our timber-getters and saw-millers as often as not call it simply "mahogany," but, in view of the better known mahogany so largely used in the northern hemisphere, it would only lead to confusion, if our timber were exported without some qualifying adjective. I would, therefore, express the hope that it be consistently called, by way of distinction (at all events in the export trade), "red mahogany," a term which is, of course, very largely applied in the Colony to this timber.

Other local names.—"Forest mahogany" is a term often used.

Characteristics.—Of a rich red colour. Very durable, and becoming very hard with age, even as hard, or harder than ironbark. Resistant to white ants, and does not discolour paint.

Principal uses.—For general building purposes and for fencing, as it is a very durable timber. It is an excellent timber for wood-paving, but while not depreciating its value in this direction for a moment. I would point out that there is just a little danger of our forgetting the merits of other valuable paving timbers. Red mahogany is often sold as jarrah, which it closely resembles, and for which I believe it is a perfect substitute. But there are fashions and fads in paving-blocks, as in many other things, and European users of our hard woods should be reminded that we have a number of other meritorious timbers to offer them. It is of a handsome colour, and works up well. It may be recommended for large turned work, and for heavy furniture. It is useful for weather-boards.

Distribution.—North coast districts.

Quantity available.—Fairly plentiful, though not so readily accessible as formerly, owing to the great demand for it.

PUNCTATA.

No description available. This and the following timber are most highly spoken of by Mr. Maiden.

POLYANTHEMA.

No description available.

QUEENSLAND BEECH.

Queensland Beech, known as White Beech in New South Wales :—A tall tree with grey bark, the leaves rough, oval, three to six inches long. Flowers white, stained with purple, in terminal panicles. Fruit blue, globose or half-globose, one inch or more in diameter. Coast scrubs of Southern Queensland and New South Wales. Wood light grey, close grained, extensively used for planking for ships' decks and flooring of verandahs : it is not readily attacked by the white ant.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 4th September next :—

New Germany.—Bay horse, about 13 hands, sprinkled white on back, mane and tail cut short, old sores on back, otherwise in fair condition.

Woodstock.—Black cow, white on belly, half moon out of each ear, tip off left ear ; two-year-old black steer, calf of the above, white spot above each eye, white spot on forehead, tip off left ear, half-moon out of right ear.

Weenen.—Black pig (boar), about a year old.

Springfield.—Black ox, forward horns, slight white under belly, branded FG ; black ox, forward horns, branded X ; black ox, up horns, branded FG. Running on Mr. Brown's farm, Glenard, blue mare, branded SL indistinct ; very thin.

Umsinga. — Dun-and-white heifer ; black heifer; red heifer ; black itole, white tip to tail ; black itole, white mark on face ; bay mare, 14.1, faint broad arrow off rump.

Richmond.—Bay gelding, 13 3½ hands high, a white spot on forehead and nose and on the wither, left hind foot white, no brand.

Estcourt.—Bay mare, black points, sore back, low condition.

The Breeding of Saddle and Harness Horses.

By Fred. Hutchinson, V.S.

AT the outset I will state that my remarks will be confined solely to the breeding of animals for saddle and harness work, and that it is my intention to exclude all breeds of cart-horses such as are generally in use for heavy draught purposes, as I feel sure most breeders will agree with me that cart blood in the class of horse mentioned above is an abomination.

Owing to the important part the South African bred animal has played during the present military operations, the breeding of horses in this country is more than likely to receive a tremendous impetus, and men contemplating taking up this important branch of breeding will naturally ask themselves what is the best course to pursue, from a remunerative point of view, to breed successfully the class of animal required.

I may further state (and this will no doubt be taken with general surprise) that it is also my intention to exclude the racing thoroughbred and the Arab as being totally unsuitable sires for this class of horse-breeding, for the following reasons: — In the first place, the racing thoroughbred is not bred to any standard type; to qualify him as a sire every other quality must give way to speed, and so long as he is able to transmit the same power to his progeny (no matter if he is the vilest crock that ever stood on four legs as regards general conformation), he will satisfy the racing breeder.

I can safely state that, after attending for some years all the important shows in South Africa, I have not seen a thoroughbred sire good enough to win at a third-rate Hunter Show in England. I have no wish to decry the racing thoroughbred. I have certainly seen a few pretty little horses of this class, but not one to which the ordinary breeders of hunters in England would care to mate his mares.

"CAST-OFFS."

In support of this fact, I invite anyone who knew the Orange River Colony before the outbreak of hostilities, to ask himself, What have the cast-offs from the South African racing stables done towards the improvement of horse-breeding during the last ten or twenty years? And this is the class of animal which, on touring the Orange River Colony, would have been seen on nearly every breeder's farm being used as a sire.

Again, I will ask for what purpose is the thoroughbred imported into this country, and I am sure everyone will bear me out when I state, solely for racing purposes; and therefore, as a natural result, every other thing gives way before this latter qualification. This method of selection is all very well for the man who wishes to confine himself to the breeding of gallopers, and he is perfectly right in selecting this class of animal, as no other would meet his requirements. There is no denying the fact that some of these cast-offs are very fashionably bred, but I wish to point out the utter uselessness of the great majority of these horses as sires for producing useful saddle and harness horses. The indiscriminate use of the thoroughbred sire has left a large quantity of animals all over the country, light of bone, long in the leg, and totally shapeless; numbers of them so reduced in substance that it would not be out of place to term them "linen-horses." This has been very bad business for the breeding farmers, and it is sincerely to be hoped that when the country once more becomes settled more judicious attention may be given in the choice of suitable stallions. Of course, we must recognise the important part the racehorse has played in breeding throughout the whole civilised world. First in the racing, where, of course, he stands out by himself, and certainly the thoroughbred could never have acquired his present importance without racing. Generations of careful mating, scientific crossing, and the infusion of variously selected strains have placed him miles ahead of any breed the world has ever known. One cannot but imagine what good results would already have been attained in this country if a particle of this attention had been given to the breeding of a few thoroughbreds to a standard type. All things can be overdone, and breeding from the racing

thoroughbred has been overdone, for numerous reasons. (I have so far used the term racing thoroughbred to discriminate between another class of thoroughbred that has been very little heard of in this country, and about which I shall have something to say later on.) In the first place there is an enormous quantity of horses needed for other than racing purposes Secondly, these horses will never be produced solely by the use of the racing sire. The continual breeding from broken-down and otherwise useless race-horses has produced a class of animal which is of very little use for any purpose whatever. One has only to look over the enormous quantity of captured stock from the Orange River Colony, *i.e.*, the premier centre of horse-breeding in this country, to verify this statement, and ask himself for what profitable or useful purpose can one quarter of these animals be put to. Again, we must not lose sight of the wonderful staying powers possessed by the South African bred animal, and their marvellous adaptability to their native veld. But the question naturally arises, why not endeavour to retain all these qualities and still bring the stock of this country up to a useful and profitable standard.

THE ARAB.

I will now draw the reader's attention to the Arab, the horse with the history above all others.

Numerous advocates would again trot out this "Oriental weed," (for as a weed he must certainly be classed when compared to a well developed and proportioned thoroughbred) as being our only hope to which we may look to success in horse-breeding. I am sure every horseman, on reflection, will admit that our native stock already possesses too many of the Arab's characteristics to again bring him into the field. Again, why recede two hundred years, and lose all the careful and scientific crossing spent by the most brilliant horsemen in the world, viz., the British Nation.

All the Arab's great points were absorbed into the thoroughbred over two hundred years ago, and when so secured he was thrown to one side, and rightly so. Again I ask, why take this retrogessive step?

I admit the Arab might be used to some purpose provided the mares we have to breed from were of the heavy Cavalry type, but this class of mare is practically useless as a foundation stock for this country. If anyone wishes to try the experiment, let him secure forty or fifty of these mares and attempt to make horse-breeding pay. I wish it to be distinctly understood that my remarks are limited to men who wish to make horse-breeding profitable, and not to the fancier. Let anyone who has not tried breeding from imported mares give it a trial, and I venture to predict that he will soon tire of the experiment. The imported animals cannot thrive on the South African veld, and not only this, they cannot rear their progeny without an allowance of artificial food all the year round, and I ask anyone with experience, can horse-breeding be made profitable under such conditions? Besides this, we must take into consideration the enormous risks attendant upon the imported animal, viz.:—Climatic conditions and the numerous diseases to which they are subject, more especially so when turned loose on the veld.

The imported mare must, therefore, be placed outside the pale of profitable horse-breeding. One or two of these animals, carefully selected, would, no doubt, be of great assistance to any stud for the purpose of breeding stallions, but beyond this they are better left alone, as the cost of supporting them would prove too great.

There is not the slightest doubt that in the breeding of Polo ponies the Arab sire could be made to play a very important part, crossed on selected native mares.

WHICH BREED TO SELECT.

Now the question arises, from what class of animal should a sire suitable for crossing on native mares be drawn. There are three distinct breeds which come up to the required standard, viz:—The thoroughbred Hunter sire, the Hackney, and the Coach horse. Speaking generally, I am sure all horsemen will admit that the qualities required in a sire to mate with the native mares of this country are size upon short legs, height standard, say, from 15h. 2in to 16h., big bone, substance, shape, and good general appearance, together with a hardy constitution. The breeds I have mentioned above possess all

these requirements to a degree, as good specimens answering to the above description may be selected from any one of the three breeds.

THE HUNTER SIRE.

I will first deal with the Hunter sire. The question arises, what breed of animal is this? He is purely a thoroughbred, bred to a standard type, and is the beau-ideal of a saddle horse, standing on short legs, with great bone, his head and neck is as perfect as possible, with big riding shoulders, short, strong back, and powerful quarters, height from 15h. 3in. to 16h. and over. The animal I have depicted above may be seen at any of the large Hunter Shows in the United Kingdom, more especially at the Great Hunters' Improvement Society's Shows, and the Dublin Horse Shows. He is what is termed a level mover, possessed of fine carriage, walks well, and displays plenty of flexible hock action in the trot, and when put to the gallop or canter fulfills all the requirements of a fine galloper. Most of these animals have been well tested over country, and are noted for their fine performances. To persons wishing to breed Cavalry horses and wear and tear country horses, this is the class of animal to which they must look for success. But this is not the only class of animal for which there is a ready market.

THE HACKNEY.

Again, like the thoroughbred, the Hackney may be divided into two classes, viz., the Norfolk and the Yorkshire, and these animals display several distinct features. The Hackney Horse Society admits of one cross of thoroughbred blood to three of Hackney strain, and the North Country breeders have taken great advantage of this, far more so than in the case of the Norfolk breeders, with the result that the Yorkshire Horse is nearer allied to the thoroughbred, but still retaining all the chief characteristics of the Hackney. If the intending breeder wishes to verify this statement let him cast his eye over the prize list of the Great Hackney Society's Show, held at Islington every spring, and he will notice that fully three parts of the honours go to Yorkshire breeders. Speaking generally, the Yorkshire horse possesses finer hock action (as the North Country-men describe it, he moves from behind), his shoulder movement is more free, thus enabling him to extend his front feet to a greater degree than his Norfolk brother. He is much finer turned all round, and does not possess the heavy neck often seen in the latter specimen, his legs are, generally speaking, flatter, and the joints clearer, the result of the greater infusion of thoroughbred blood. To breeders wishing to produce animals more especially for town work, and secure profitable prices for their stock, no animal can outclass the Hackney as a sire. Some persons are very fond of asking the question, of what use is all the extravagant action displayed by the Hackney? To prove that, from a profitable point of view, it is of very great use indeed, is to mention that fashion demands it, and whatever fashion does demand it will pay for. For instance, let there be offered for sale even in any South African town two animals of exactly similar type, the one with action, and the other an ordinary mover, and I venture to say that the one with fine action will command double the price of the other. Fortunately for the breeder of the Hackney, the fashion for fine action is not quite so erratic as it is in some other respects; it has been in demand ever since the introduction of the light spring vehicle. Let anyone note the fashionable equipages to be seen in all the great European and American cities, and then let him deny that the breeding of stepping horses does not appear encouraging to the breeder. It must be distinctly understood that the crossing of the Hackney Sire on the native mares will not in every case result in the production of a fine mover, but any animal which may fall short in this direction will always meet with a ready sale for Mounted Infantry purposes and general utility.

Some people are very fond of making the remark: Oh, the Hackney is soft. For that matter soft horses will be found in every breed, even amongst thoroughbreds, as any trainer will tell you, but I have no hesitation in stating that these animals are greatly in the minority as regards the Hackney. On several occasions pure bred Hackneys have covered from eighteen to twenty miles within the hour in single harness; can anyone deny that this test of endurance

is not equal to any required on the Race-course, even to the Grand National itself. For records of wonderful performances accomplished by horses of this breed, I would refer the reader to the first volume of the Hackney Stud Book, as no paper of this kind could do them justice.

The high forward knee generally looked upon in this country as the chief characteristic of the Hackney, I admit, is an abomination, and of no use whatever, and a horse of this description will quickly develop any of the unsoundnesses to which the fore limbs are addicted, and is of neither use nor ornament. True action should commence at the hock, and not at the knee ; the hocks should be flexed to their utmost in the trot, and should be kept well together, the front feet should leave the ground quickly in a direct line with the elbow, and then extended to their utmost limit before they again reach the ground.

A horse with this kind of action will be found to do his work comfortably, and with far greater ease to himself than in the case of a horse without hock action. An animal of this description can always be made to display plenty of forward action when necessity requires it, either for Town or Show ring, by driving him to his bridle.

(To be continued).

Instructions for taking Samples for Analysis.

By Alex. Pardy, F.C.S., Agricultural Chemist.

Soils.

LOOK over the field and note its size, altitude, and general formation.

Note if there is any appreciable difference in the kind of soil.

Take a thoroughly clean wheelbarrow, clean sharp spade, a clean sack (preferably a new one), one or two small wooden boxes or canvas bags, and a notebook.

If the soil is uniform and does not show any variation, then sub-samples may be taken from four, five, or more places throughout the area, but avoiding headlands, proximity to roads, trees, and such like, so that a good representative sample from those parts which resemble each other, and mix them together, but do not mix two different sorts of soil ; or, better still, samples from each part may be kept quite separate. Should the land be under crop the sample should be picked midway between two plants.

Having selected a spot, pull up any growing plants, and remove all surface vegetation, then dig a hole $2\frac{1}{2}$ to 3 feet deep, cut away the soil so as to leave a block the width of the spade standing out from the side to the centre of the hole ; pare the sides so that they shall be clean and vertical, place the sack flat down in the hole, then with the spade take a clean vertical cut down and allow the section to fall into the sack. The subsoil is taken in the same way after the topsoil has been removed, and must be kept quite separate. Take a number of sub-samples in this way, and mix those of a kind thoroughly together in the wheelbarrow, take about 10lbs. of the mixture, parcel it up, number and label it so that it may be referred to again in the report.

Carefully note down the appearance of the soil and subsoil, the depth at which a change of colour, if any, is observed, and the depths to which roots have penetrated. If a line of demarcation is not possible between the surface and subsoils, then take the first nine inches as being the surface soil, and from nine inches to two feet as the subsoil ; each sub-sample should be taken to a uniform depth.

Pack the samples in a wooden box preparatory to sending away, and while waiting despatch, see that it does not lie near a cowshed, stable, or manure heap.

Address and forward to the Agricultural Chemist, Government Laboratory, Berea, Durban.

Send along with the soil a description and rough plan of the field or fields, showing the spots where the samples were selected, and indicate thereon the slope, aspect and proximity, of a spruit or river.

State whether the land is virgin or cultivated, if the former, whether under bush or grass; if the latter, how long it has been under cultivation, to what crops, and the nature of the last crop produced, together with the general results of such crops.

State whether any manure has been applied, when, what sort and how much to the acre; whether the land is naturally or artifically drained, and if the drainage is good, also the behaviour of the land in wet or dry seasons.

Give all details possible as to the characteristics of the soil, and where advice in manuring is sought, specify what crop it is intended to plant.

MANURES.

When sampling artificial manures, select four or five bags from the consignment, and empty each one out separately on a clean wooden floor. Work each heap thoroughly with the spade, then take a spadeful from each, place them together in one lot, and work well up until a uniform mixture is obtained; divide into four parts, take one of these parts and mix thoroughly, breaking down any lumps with the hand, so that when finished it may represent a fair average of the bulk. Place about 1 lb. in a bottle, and cork up tightly, so that no loss of moisture will take place.

When a sample is required for analysis to confirm a purchase, the seller, or his agent, should be sufficiently notified of this purpose, so that he, his agent, or two witnesses, may be present during the picking and sealing up of the sample. The portions so selected should be at once placed in bottles, sealed up, one or more handed to the seller, one retained by purchaser, and one sent on to the Chemist for analysis.

Samples may be forwarded by rail or parcel post, either to the Minister of Agriculture, or direct to the Agricultural Chemist, Government Laboratory, Berea, Durban.

To Australia and Back.

By the Hon. T. K. MURRAY, C.M.G., M.L.A., Natal Representative to the Opening of the First Federal Parliament, May 9th, 1901.

FROM MELBOURNE TO SYDNEY.

We left Melbourne for Sydney on Tuesday evening, April 30. The Government reserved a compartment for us, and did all they could to make us comfortable.

Shortly after leaving Melbourne, we got into the gum country, although I had so often heard of the Australian Bush, I did not think it was almost all gum. For hundreds of miles it is trees, and nothing but trees, which mostly look alike, not tall, as the gum tree grows in Natal, but bushy at the top; practically the only open spaces between Melbourne and Sydney are what have been cleared. The only variety which strikes the eye is the white barked, or, as it is commonly called, the satin wood. The country is so very flat that one can seldom see more than half-a-mile or so, and I began to wonder which was the most monotonous, gums or karoo. It must be very depressing to live shut in among these trees, and be very hot, too, in the summer.

We went over one range of hills between Melbourne and Albany, which is on the Murray River, 190 miles from Melbourne. The flatness of the Colony can be better understood when it is mentioned that that place is only 500 feet above the level of the sea. There are dead trees and stumps everywhere. Where the land has been cleared, there the dead ringed-trees stand, or have fallen, and lie rotting. We often saw men burning the logs to get rid of them, and this occurs all along the railway. Here and there were saw mills cutting this dead wood up into short lengths for firewood. The evenness of the surface also struck me—no dongas, stones, ant heaps; and were it not for the stumps and fallen wood one might ride a bicycle anywhere, the grass, where there is any, is now so very short. The soil seems mostly of a sandy nature, and ploughing seems to be limited to the land which has been cleared. I frequently saw ploughing round the gum stumps.

In some parts there is a good deal of cultivation, but for miles and miles there is nothing but bush. A cutting or embankment on the railway is quite an exception.

In some places where the land has been well cleared and a few of the best trees left, it makes it very pretty and park-like. I kept thinking how was it that this country, which to my mind did not look nearly so good as our own, seemed to prosper. It may be that our summer rains make too much grass of too rank growth. Here there seem to be few diseases, ticks or blights; and what they have to contend with is drought. In some districts they have had little or no rain for five years, and, roughly speaking, half the live stock of the country must have died. I had the good fortune to meet three well known men in New South Wales who probably know that Colony as well as most men, Mr. Richards, of the Riverstone Meat Company, the largest stock buyer in that part, Mr. Badgery, one of the largest stock auctioneers, and Mr. Aitkin, who travels for the "Hercules" Ice Machines. I had long and interesting conversations with each of them, and was able to obtain a good deal of information about places I had no opportunity of seeing.

In the Bourke district the drought has been very severe, nearly all stock has either died or been removed. Quite recently there were over 200 empty houses in Bourke. One man had sent away 10,000 sheep by rail to save their lives. When it does rain in this country stock fatten very quickly; much less rain is required in most parts of Australia than with us, the country being so flat it does not run off. One of the best dairying districts, I was told, was Clarence, north of Newcastle. This is also their sugar district, but the industry is not a very paying one, and much of the sugar-growing land had been converted into dairy farms, with the result that, instead of being poor, the people were becoming rich. The average return per cow is about £1 per month.

The distance from Melbourne to Sydney by rail is 576 miles, which takes by express 17½ hours, about 33 miles an hour, including all stoppages. The Victorian railways are wide gauge, and the New South Wales narrow, necessitating an unpleasant change at Albany, late at night and early in the morning. Meals are not supplied on the train, but very fair meals, at reasonable charges, are to be had at Seymour, Albany, and Moss Vale. The district from Albany to near Moss Vale is passed through both ways at night. About the Murray River all kinds of farming go on, vines and other crops, sheep and cattle, all seem to do well.

The scenery, early in the morning, near Moss Vale, in New South Wales, is much more interesting, as there are large trees with a good deal of undergrowth. After passing Moss Vale the country has been much more cleared, and resembles part of Gloucestershire only gum trees. Here we see patches of mealies and sorghum.

SYDNEY.

Sydney is another fine city, almost the same size as Melbourne, but the streets are narrow and crooked. There are hansom cabs and omnibusses, just as in the Strand in London, and also electric and cable trams. There is a very objectionable steam tramway right through the city. The buildings are very fine, the Post Office and some others especially so. The streets in places are very steep, and, as my wife remarked, the hills in Australia seem to be all in the towns.

The people of Sydney are justly proud of their Harbour. There is deep water up to almost the centre of the city. 12,000 ton vessels were lying at the bottom of Pitt Street, and paddle steamers by the score run to all parts. We took a run out to Manly and back, half-an-hour each way, sixpence return fare This place is near the gates to the Bay, and is a pleasant resort. The gates or entrance is about a mile across, with rocky cliffs on both sides. The Harbour itself might be a hundred Durban Bays all placed together. The main bay has dozens of smaller bays off it, all woody hills with rocky beaches, something like the sides of the Umkomaas River in Natal. The suburbs and surroundings of Sydney are beautiful. I met Mr. See, the Premier, Mr. John Kidd, the Minister of Agriculture, and other prominent men. I also had an opportunity of seeing the Naval contingent from China return to Sydney.

I visited the stock market near Sydney, and saw about 20,000 sheep and about

1,000, cattle sold. Both are scarce just now, and prices are high. Very few of the cattle were really fat, and would only be called stores in ordinary times. Cattle were worth £8 to £12, and sheep from 10s. to 14s. each, quite 50 per cent. more than the usual price. A large number of the cattle seemed a cross of Devon and Hereford breeds.

I spent an interesting afternoon in going all over the Fresh Food Supply premises where much of the food we get in Natal is frozen. One of the engines used makes 80 to 100 tons of ice per day, called a 160-ton engine. The beef and mutton is stowed in immense cold chambers. A quarter of beef takes about a week to freeze properly, mutton about three days, There were rooms for game, poultry, fish, butter, and bacon, and butter-making was also being carried on. I saw some meat, marked "Natal," ready for shipment.

The Hotel Australia is a very good one, on the American style. To give an idea what these hotels are, I may mention that the lounge in the centre of the building very much resembles the main chamber in our Assembly buildings, with tree ferns and small tables all about. The hotel is six storeys high, not including basement and attics, with lifts, &c. The dining-room can seat 300 people. Our bed-room had private bath-room attached, hot and cold water everywhere, charges about 17s. per day.

The gardens and Town Hall are very nice. Fruit of all kinds, grapes, pears, apples, bananas, grenadillas, plums, and pineapples are to be had in any quantity.

Sydney is much warmer than Melbourne. It rained a good deal while we were there, but when the sun came out it seemed much like Durban at this time of the year. One man told me that up at Bourke it was about 120 degs. in the shade for some days while he was there. It must be hot shut up in the bush.

We left Sydney on Saturday evening, and got back on Sunday afternoon.

At Sydney, I found the horses much better than the general run of horses here. The mounted police are well mounted on bay horses. White girls wait at the tables along the railway line; in fact, much of the labour is done by white girls and women. It seemed strange to see a white-bearded old man milking as we passed one place. The smallness of the cottages also struck us; they are mostly wood with iron roofs, one door with a small window each side, and small shed at the back for their farm cart, horse, etc. Another noticeable thing is that we have not seen a rabbit yet. Fences are nearly all post and rail; sometimes the gum logs are piled along as a fence.

We saw several gold mines near Seymour Deep, working for alluvial, I was informed.

On Monday, May 6th, the celebrations commenced, and right royal they have been. Nowhere could they have been better. They have been so fully described in the press, that I will only deal briefly with them. St. Kilda, where the Royal party landed, is about five miles from Melbourne City. The St. Kilda Road is something like our Point Road. This Road was decorated and railed all along. At the bridge over the Yarra River there was a magnificent arch. There, the Mayor met the Duke. The City was just one blaze of flags and decorations. We were stationed on the steps of Parliament House, and as the procession came along we could hear the cheering. It was a grand reception, well done in every way, and a perfect day.

The illuminations were also grand. The first night the crowd was so great we did not venture out, but drove all round afterwards. Some of the illuminated fountains and arches were very pretty. Dinners, receptions, garden parties, etc., were arranged for almost every day. There was a great night at the Exhibition building—an immense place, with bands, concert, etc., and a champagne supper for 12,000 people. It was a great show and well worth seeing.

The stockmen's procession was very good, about 200 mounted men in red shirts and felt hats, all cracking their whips as they went past at a canter.

The Chinese procession was very pretty, any number of beautiful flags, banners, etc., and two immense dragons, all gilt work, with about fifty men under them for legs. There were also numbers of wonderful gods in carriages, gongs, trumpets, etc., something like one of our Indian processions on a very grand scale.

There was a very good review at Flemington Race Course of about 10,000 Volunteers, and 5,000 Cadets,

The Children's Fete was one of the best things here, thousands of them singing and dancing. There were twelve May-Pole Dances going on at one time, each in different costume. The Flower Dance was very pretty, some hundreds of girls each with either a bouquet, or arch of flowers, dancing and singing.

The Premier of Tasmania has arranged a very nice tour through that Island for us, which will occupy all next week.

We have been invited to a reception at Government House to meet the Duke and Duchess, and are to dine with them on Monday.

TASMANIA.

We returned to Melbourne from Tasmania on the 19th May. Mr. Lewis, the Premier, the Hon Mr. Henry, and others, were very kind to us. We left here on Tuesday morning in the "Penguin," a small steamer of about 200 tons, and returned on the "Googee," about the same size. The run across takes about 20 hours, and is generally very rough, something like crossing the English Channel. Many who are never ill on an ocean steamer have a very bad time. It certainly is not enjoyable.

We arrived at Burnie early in the morning, and went along the coast about two hours to Devenport, a nice little harbour on the Mersey River.

Before describing Tasmania, I may say that it seemed so funny to us to find so many British names jumbled together. De Wet's rapid movements were not in it with us. One moment we were in Epping Forest, the next few minutes at Ross, then at Tunbridge Wells, soon after at Glen Orchy, and so on. All the counties are also called after British counties in the same way—towns, rivers and counties, awfully mixed up.

At Devenport young Mr. Henny met us and drove us inland to a place called Sheffield, about 15 miles in the heart of the potato country. Like most of Australia it is nearly all wooded, and there are some very large blue gum trees. I fear most of our farmers would look a long time at this country before taking it up for agriculture. The large trees have first to be ringed, then all the smaller scrub cut down and left to dry. This is then all burnt. All the big timber remains dry and charred, and the land between is either sown with grass or ploughed. Very heavy crops of potatoes are at first grown on this land, from 10 to 15 tons per acre, gradually dwindling down to three to four tons, and plenty of bone dust has to be put on. We saw potatoes everywhere, thousands of sacks. The price this season is considered very good, £3 to £4 per ton, often they are from £1 to £2. A lot of money must be expended on all land in Tasmania before getting a crop. One man told me he lost £30 last year on 12 acres of potatoes he put in. From what I could gather, it generally cost about £3 an acre to cultivate, and if the produce was only three or four tons of potatoes at low prices they often lost money. Wheat, they say, does not pay to grow, 20 to 25 bushels to the acre at about 2s. 6d. per bushel. The holdings towards Sheffield are nearly all small, a few hundred acres or less. Good land about there was fetching up to £15 an acre—that was land fit to plough. To entirely clear the land would cost £20 to £30 in some places. These ringed trees stand for 25 to 30 years, great white ghosts. The branches gradually fall and are burnt.

All over Tasmania the land seems very patchy. For miles the land is poor and has not been cleared, then one comes to a part all taken up and every acre cultivated. Some parts that have been entirely cleared are just like England itself, cattle, horses, sheep, fences, crops, everything the same. Then one comes to bush land, quite a transformation scene. From Sheffield we continued our drive to Railton, where we joined the railway to Launcestown. It was on this road we saw rabbits for the first time, certainly plenty of them. There seem to be three pests—rabbits, sparrows, and blackberries, all imported. It seems that a man of the name of Fenton imported three blackberry plants; one died, and the other two were carefully tended; now the plant is obtaining possession of hundred of acres, nothing will kill it, the soil being mostly of a sandy nature seems just to suit it. Then it affords splendid cover for rabbits and sparrows, and the three together are

going strong. It is a very pretty drive down from Sheffield to Railton. Here we also saw bullocks being used, generally four or six, never more than one man to a team, all American yokes as we call them, and no reim or rope on their heads. They tell me one man can easily yoke and travel about with six pairs, putting them all in the yoke single handed. They seem to go along very quietly.

The country is much more mountainous than Australia generally, having high ranges on all sides. There was snow on the Black Bluff when we were there.

The trains in Tasmania are much like ours, but the stations are not nearly so good. Bellair Station would eclipse anything we saw, although Hobart and Launcestown have populations of over 20,000 each.

We arrived at Launceston in the evening, and were very comfortable at the Brisbane Hotel. The next morning, Mr. Sutton, the acting Mayor, drove us to the Electric Lighting Station. The River Esk has been utilised, and about 800 horse power obtained. The generating station seemed all that could be desired, and the whole scheme a success.

We then drove roun l the town and up to the Gorge, the beauty spot of Launceston. The River Esk runs between two precipices. A footpath has been constructed at a cost of about £6,000 up the shady side, and ferns, etc., are planted in every nook. It is very pretty. The walk is about two miles long, with tea gardens and pleasure grounds at the end. A toll of one penny each is charged for admission to this walk and grounds. The population of Launceston is 28,000.

We left there at 3 o'clock, and arrived at Hobart at 9 p.m. The weather was perfect. When I looked out from our bedroom window next morning, I remarked that it reminded me very much of Capetown, Mount Wellington being in the back ground. Unfortunately we also had a regular Cape south-easter, the dust and pebbles were flying about everywhere. We drove up the river about six miles, a wonderfully pretty drive, and lunched with some friends of our travels. We had to leave Hobart early next morning, 8 o'clock, to catch our boat at Launceston at 2 p.m. The country about Ross is very open and pretty, but the grass is very short everywhere ; nowhere could one have cut a sackful. Nearly everyone we met was complaining that farming did not pay. They were hoping for good markets when the high protective duties of the Australian Colonies were removed. The farmers are the free traders over here, and the labouring classes the protectionists.

Hobart Harbour is one of the finest in the world, with deep water and fine shelter. From Launceston we ran down the Tamar, about 40 miles to the sea. All around the coast of Tasmania there are good harbours. I was surprised to find such a large proportion of Tasmania quite unoccupied, there still being almost un explored forests. There are some very fine inland lakes full of trout.

We enjoyed our trip to Tasmania very much, all except the going and coming. The people were all very kind and we could have enjoyed a month there.

We did not see much of the orchard country, it lies mostly along the Huon River ; we saw a good deal up the Derwent. They keep the trees young and cultivate very carefully. In fact they have to work hard and spend a lot of money to get anything. The rainfall is fairly good and diseases few. Fluke and sheep tick trouble them in places.

MELBOURNE TO NATAL.

We left Melbourne on May 22nd, and had another very rough passage across the Bright, had to lie-to altogether one day. We hardly had the fiddles off the table for the krst fortnight. The only decent weather we had was the last week of our voyage. We reached Albany, a very snug harbour, and pretty little town on the south coast of Western Australia, on the 28th, and stayed there coaling all day. The coal is kept in hulks in the Bay. I was told it cost 30s. per ton. This coal is brought round from New South Wales.

We had a drive out into the country, which is almost all thick bush. They grow very little in Western Australia, mostly timber. The meat in the shops had been brought from South Australia, and was selling at 10d. per pound. Formerly the mail stemers all called at Albany, now they mostly call at Freemantle. We resumed our voyage that evening, and had another very rough time

coming round Cape Leeuwin, and arrived in Durban on Saturday, June 15th, having been 24 days from Melbourne. The return voyage is a warm one as we bear northwards instead of to the south. We reached home that night, and although we had had a really good time, and like Australia, we thought there was no place like home, and there are many worse places than Natal, and few better.

Veterinary Departmental Report for May, 1901.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I have the honour to forward my Departmental Report herewith for the month of May.

The point most deserving of notice in the monthly work of the Department is the state of the Colony north of the Tugela. This still continues to remain in a highly infected state, although all that is possible is being done to minimise the risk of spread of disease. As many as 76 fresh licenses for lungsick cattle have been issued in the Newcastle and Klip River Divisions. These outbreaks are attributed by D.V.S. Hutchinson to the direct importation of the disease amongst uninoculated cattle, which cattle have been collected in the neighbouring Colonies and brought into Natal, having been driven with the columns for some weeks before entering the Colony. The fact also that infected cattle are being continuously introduced in exchange for horses, will tend to keep up the large number of licenses issued by the Veterinary Department, many of these licenses being renewals of previous issues. The loss amongst "cattle secured in this manner is very heavy, fully 36 per cent. having succumbed to the disease." In contrast to this is the mortality experienced amongst the discharged military transport oxen at Elandslaagte. Here amongst 2,377 head, only 85 deaths have occurred from lungsickness and inoculation, or a percentage of only about 3 per cent.

Useful work is being still performed by the Pieters Quarantine Depot, as 657 animals have been passed into the station, and 959 liberated as clean during the month.

The numbers of sheep entering the Colony are instructive. Forty thousand captured sheep, and forty-six thousand, the property of surrendered burghers, have entered through Charlestown, while over eighteen thousand have passed through the Coldstream dipping station.

The purchase of loot horses cannot be a very profitable speculation when an average mortality of about sixty to seventy per cent. will have to be encountered before the deprivations and cold of the winter season give place to more favourable conditions. The possibility of glanders existing amongst these animals should not be forgotten by intending purchasers or existing owners.

The point brought to notice by D.V.S. Amos as to the occupation by human beings of premises condemned as glandered should at once be brought to the notice of the Medical Officer of Health on his appointment.

Horsesickness has taken a reluctant leave after exacting a terribly high death rate in Durban, as elsewhere. No expense or trouble is too great to endeavour to check this evil, which I conceive to be the greatest drawback to Colonial prosperity.

H. WATKINS-PITCHFORD,
P. V. Surgeon.

MARITZBURG.—D.V.S. WOOLLATT.

My duties during the month have consisted chiefly in carrying on the ordinary routine office work of the Department.

On the 14th May I proceeded to Melmoth, Zululand, to investigate a suspicious case of glanders, isolated by the stock inspector there. The animal on

Umzimkulu Sugar Co.'s Mill.

Canal to Mill.

Umzimkulu River: Mill Indians' Location.

View from Barrow Green Estate.

inspection showed marked clinical evidence of the disease, and was destroyed. All the necessary precautions were taken.

Visits were paid to the clean Quarantine Depot at Pieters during the month, all the cattle there being in a most satisfactory condition; 657 oxen were admitted, and 959 oxen discharged during May.

At Elandslaagte, the area for discharged military transport oxen, 2,377 head of transport cattle have been running. Eighty-five deaths have occurred from lungsickness and inoculation, and two deaths from other causes. The mortality has been chiefly from lungsickness; few cases have died from inoculation. Of the 2,377 oxen 964 have been inoculated for lungsickness during the month.

IXOPO.—D.V.S. VERNEY.

Scab.—This disease is much more prevalent than I would like to see.

Lungsickness.—Another outbreak of this disease has occurred in the Boston district, on Mr. Lewis' farm. The disease broke out in an ox which had been used considerably for transport purposes between Boston and Pietermaritzburg. Mr. Johnstone's (Ixopo Division) cattle have been released from quarantine. These cattle have been under license for eight months, and the loss from disease has been somewhat heavy.

Influenza has been very rife this month, but for the most part horses have made good recoveries.

Horsesickness was fairly prevalent at the commencement of the month, but the advent of frost has fortunately stopped further disease.

Vegetable Poisoning in cattle is still quite common. I had an opportunity of examining some cattle suffering at Boston from what I consider to be vegetable poisoning. The animals affected showed tremors of the muscles, salivation, champing of the jaws, pupils contracted, knuckling of hind fetlocks. When made to move the abdominal muscles were moving involuntarily, like a man with hiccough. Temperature normal, water discharge from eyes and nose. Appetite lost, and constipation marked.

The postmortem showed most intense congestion of the lungs, pericardium full of blood-like fluid, and brain congested.

MOOI RIVER.—D.V.S. WEBB.

Stock Inspector Wilkes, in his report, says:—"Over 4,000 sheep have been brought into the district during the month; they had previously been dipped, but still are anything but clean. People are dipping, but as the weather is intensely cold, they will probably lose half by doing so."

Horsesickness.—Numerous cases of this disease occurred during the first part of the month, but since the frosts have set in the disease has subsided.

Contagious Ulcerative Stomatitis.—A large number of horses in various parts of the county have been afflicted with this disease in many instances of a severe character; like horsesickness, this disease has disappeared now that cold weather has arrived. During the month I have been called in to attend 21 cases, which have necessitated 32 visits; these are apart from cases brought to my headquarters for advice or treatment.

GREYTOWN.—D.V.S. CORDY.

Scab.—Three fresh outbreaks have occurred during the month, two in the Western Umvoti Division, and one in the Krantzkop Division.

Lungsickness.—An outbreak has occurred among a troop of 95 head belonging to Mr. E. Boast, "The Avenue," York. Thirty were drenched, and the remainder inoculated. Three others have shown symptoms of the disease since the beginning of the month.

Glanders.—An outbreak occurred among a troop of nine loot horses, the property of Messrs. F. and G. Reiche, of Noodsberg Road. These animals were bought in Pietermaritzburg, at one of the military sales. One of the number was showing clinical symptoms of farcy, and two others suspicious symptoms of the same disease. These three animals were destroyed, and in each case the nodules of Glanders were found to be present in the lungs. The fittings of stable, with

bedding, have been destroyed by fire, and the place thoroughly disinfected, and as the remainder of the horses did not react to the Mallein test, I am hoping the disease has been stamped out in this stable.

Horsesickness.—During the past month this disease has been very prevalent in this District, and has been the cause of a large number of deaths among horses.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—The following numbers of fresh licenses have been issued during the month in the respective Divisions of my District, viz. :—Newcastle, 11; Dundee, 12; Umsinga, 13; Upper Tugela, 6; Ladysmith, 34. A large number of transport oxen have been returned to their owners by the military infected with lungsickness, but the majority of the outbreaks are due to the direct importation of the disease amongst uninoculated cattle. These cattle are collected in the new Colonies, and in many instances are driven along with the columns for weeks before they enter the Colony, when by this time they have become thoroughly infected with the disease. Numerous farms have been under license since shortly after the re-occupation of this district, being due to the fact that the majority of owners are continuously securing infected cattle from the Captured Stock Depot in exchange for horses, which necessitates the continual renewal of licenses. Losses amongst cattle secured in this manner have been very heavy, fully 36 per cent. having succumbed to the disease, together with the ill-results of inoculation, and numbers that have recovered will eventually die from emaciation before the arrival of spring.

Scab.—The following number of fresh licenses have been issued for Scab, viz.:—Newcastle, 7 ; Dundee, 5 ; Upper Tugela, 1 ; Ladysmith, 12. Approximately 40,000 captured sheep have entered the Colony during the month via Charlestown, irrespective of those belonging to surrendered burghers, which amount to about 46,000 ; of these over 18,000 have passed through the Coldstream Dipping Station, the remainder entering the Colony under Section 20 of the Scab Law. Besides the above numbers, about 80,000 have entered via Van Reenen since the commencement of winter. An immense quantity of stock of all descriptions has been brought down for winter grazing belonging to surrendered burghers, and the whole of the country north of the Tugela River suitable for winter grazing is rapidly becoming over-stocked. This, together with the serious grass fires occurring all over the country, will, I am afraid, be the cause of tremendous losses from poverty before the arrival of spring.

"Talking about agricultural shows," a New Zealand correspondent writes, "the secretary of our society has this rather puzzling paragraph in the show programme :—'Among the other attractive features of the exhibition will be a highly amusing donkey race and pig race. Competition in these two contests open only to members of the society.' "

A young French scientist, Dr. V. Jarre, of Paris, has discovered a cure for foot and mouth disease, which he has communicated to the French Academy of Medicine. The treatment was only made public after it had been established by hundreds of trials made by veterinary surgeons and experienced agriculturists. The remedy consists of a concentrated solution of chronic acid (chemically pure) at 33 per cent., employed as a caustic. With a piece of cotton wool soaked in the solution the sores of the mouth are lightly painted. The cure is rapid, and animals commence to browse five minutes after cauterisation. The treatment of the feet is rather longer, but equally satisfactory.

An old English farmer, writing to the "Live Stock Journal," gives some interesting reminiscences of an experiment in cross-breeding. Twenty black polls, cows and heifers, were obtained from Scotland, and crossed to Shorthorn sires for dairy purposes. Eventually every trace of the black poll disappeared. The result of the experiment was decidedly successful. He had an ideal dairy cow, and a splendid grazier. There was something very erratic in the action of the cross, sometimes the progeny of the first cross was hornless, and sometimes had horns even longer than those of the sire. Not infrequently the colour of the first cross was a roan or a light red, and a few were blue roans.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inandwa & Ndwedwe	Lungsickness	Grichie ...	Newlands.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	W. Ralfe ..	Ennersdale.
		,,	F. R. Moor ...	Greystone.
		,,	Cooke & Co. ...	Blue Krantz.
		,,	F. Bloy ...	Monte Christo
		,,	— Maritz ...	Springbank.
		,,	Jas. Ralfe ...	Frere.
		,,	F. Knapp ...	Klipfontein.
		,,	G. M. Rudolph ...	Spitzburg.
		,,	J. W. Moor ...	Moorleigh.
		Lungsickness	A. & W M. Henderson	Elands Park.
J. Button .	Estcourt, South of Bushman's River	Scab	S. Nel ...	Wagon Drift.
		,,	D. Mackay ...	Dalton.
		,,	R. Mattison ...	Fernhurst.
		,,	C C. Randles ...	Glen Lyndon.
		,,	C. Cope	The Hoek.
		,,	J. Mattison ...	Klip Stone-
		,,	C. B. Lloyd ...	Hidcote.
		,,	Mrs Lindsay ...	Rosebank.
A. H. Ball .	Weenen ...	,,	T. J. Van Rooyen	Belle Vue.
		,,	C Van Rooyen & J. S. Els	Scottsberg.
		Lungsickness	Mgina... ...	Location
J J. Hodson ...	Lion's River ...	Scab	Jas. Morton ...	Tweedie Hall.
		,,	A S. Parkinson ...	Shafton Grange.
		,,	A. C. Thomson ...	Fort Nottingham.
		,,	W. Taylor ...	Fordoun.
		,,	W. T. Shaw ...	Shawswood.
		,,	W. Pepworth ...	Bolesworth.
		,,	Mrs F. McKenzie	Onverwacht.
		,,	W. L. Methley ...	Newstead.
		,,	S. Nurden ...	Wood Farm.
E. J. B. Hosking ...	Upper Umkomanzi	Lungsickness	Geo. Hackland & Sons	Inhlayuka.
		Scab	H. Nicholson ...	Alton.
R. J. Raw .	Impendhle ...	,,	R. Ogram ...	Tilletudleni.
		,,	— Roberts ...	Ebrington.
		,,	C. P. Spiers ...	Mount Park.
		,,	Sobuqu, Verta & Pinda	Natal Land & Colonisation Co's farms.
		,,	Nozulela ...	Nooitgedacht.
		,,	T. Fleming ...	Good Hope.
		Lungsickness	Donga ...	Johnstone.
		,,	C. C. Lewis, and Native ...	Clairmont.
W. Wilson ...	Polela	,,	Miller, Bros. ...	Fairacres
		Scab	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
		,,	R. Nicholson ...	Lowlands.
		,,	R. C. Gold ...	Woodend.
C. E. Hancock ...	Ixopo ...	Lungsickness	W. W. Walton & Natives	Dronk Vlei.
		Scab	R. Kennedy ...	Cornhill.
		,,	A. Watson ..	Rosehill.
		,,	W. Gray ...	Helmsley.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
C. E. Hancock ...	Ixopo ...	Scab	Natives ...	Langefontein.
		,,	E. H. Surridge ...	Chadwell.
		,,	Rulumeni ...	Farm adjoining Chadwell.
		,,	J. Dalgarno ...	Abercairney.
		,,	A. Stone	Craigie Lee.
		,,	W. W. Walton ...	Dronk Vlei.
J. F. Bernard ..	Newcastle	Lungsickness	A. A. Osborn ...	The Mount.
		,,	J. F. Grant ...	Hilldrop.
		,,	J. Mortimer ...	Try Again.
		,,	P. W. Dept. ...	Newcastle T'Lands
		,,	C. Watson ..	River Bend.
		,,	J. R. Watt	Horn River.
		,,	A. & S. J. James...	Paradise.
		,,	G. E. Jubber ...	Brackfontein.
		,,	W. L. Oldacre ...	Nil Desperandum.
		,,	C. Collyer ...	Stilazie's Kop.
		,,	N'castle Corporation	Newcastle T'Lands.
		,,	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		,,	J. W. Goodwill ...	Cornwall.
		,,	Harvey & Retallack	Lease 42.
		,,	A. Paine ...	Mount Prospect
		,,	F. W. Hatley ...	,,
		,,	E. Parker ...	,,
		,,	Natives ...	Droog Plaats.
		,,	A. Krause ...	Filexton.
		,,	G. W. Nourse ...	Ruth.
		,,	Simeon Ndhlovu	Freda.
		,,	S. W. Reynolds ...	Newcastle T'Lands.
		,,	O. Olver ...	,,
		,,	G. W. White .	Ruth.
		,,	C. R. Savory ...	Pomeroy and Evir.
		,,	Blizzard & Pratt	Ingogo.
		,,	J. W A. Welsh...	Paradise.
		,,	G. Wood ...	Heron's Court.
		,,	W. L. Jee ...	Lennoxton.
		,,	A. F. Henderson...	Brazil.
		,,	D. & W. Uquhart and Natives ...	Laureston.
		,,	A. J. Crawford and Natives ...	Diamond.
		,,	Natives ...	Milton.
		,,	Lowrens and Van der Merwe ...	Buffalo River.
		,,	H. Fick ...	Northdown.
		,,	H. Austin ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	Natives ...	Elizabeth Dale.
		,,	J. Masangu ...	Pernambuco.
		,,	Funwayo ...	Tiger Kloof.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	G. W. Nourse ...	Glen Harte & De Wetstroom.
		,,	W. Steele ...	Tweefontein.
		,,	— James ...	Newcastle.
		,,	A. S. Carbairns ...	Mooi Plaats.
		,,	Umketega ...	Vrede.
		,,	Bonombi ...	Heron's Court.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	F. Stevens ...	Newcastle.
		,,	A. J. Hurd ...	Tweefontein.
		,,	G. J. Way (Derelict Stock) ...	Vrede.
		,,	Mtshabane ...	Reserve.
		,,	Mahakan ...	Kilbarchan.
		,,	Johannes ...	The Reserve.
		,,	Umbetta ...	Freda.
		,,	R. Morrison ...	Newcastle.
		,,	Maling & Sibibi...	Blauwboshlaagte.
		,,	Umgubana & Mahlogozulu ...	Hope Farm.
		,,	S. W. Reynolds ...	Ramsgate.
		,,	Mangweni ...	Hope.
		Scab	G. J. Way ...	Vrede.
		,,	G. Star ...	Lennoxton.
		,,	R. S. Miller ...	Goloch.
		,,	C. G. Palmer ...	Dry Cut.
		,,	W. L Jee ...	Lennoxton.
		,,	J. Davidson ...	,,
		,,	A. J. Debenham...	Knowsley.
			G. Wood ...	Heron's Court.
		,,	A. D. Uys ...	Horn River and Mooi Krantz.
		,,	T. Ferrier ...	Henley.
		,,	G. Jackson ...	Try Again.
		,,	W. Richards ...	Tweefontein.
		,,	W. E. Few ...	Erin & Imbezana.
		,,	Blizzard ...	Ingogo.
		,,	W. Short ...	Potter's Hill.
		,,	J. Matthews ...	Shakespeare.
		,,	G. Brown ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	R. S. Armitage ...	Boschhoek.
		,,	H. P. Beare ...	Harte River.
		,,	— Wood ...	,,
		,,	Jim Smith ..	Lennoxton.
A. S. Parkinson ...	New Hanover ..	Lungsickness	E. Boast ...	The Avenue, York.
A. Hair	Umgeni and Borough of Pietermaritzburg	,	Anea & Latcham	Plessis Laager.
		,,	W. Oldfield ...	Ambleton.
		Scab	Dickinson Bros....	Braeburn.
J. Chaplin ...	Klip River	Lungsickness	Ulukozana ...	Bishopstowe.
			Discharged Transport Cattle	Matowan's Kop.
		,,	A. H. Spring ...	Reserve.
		,,	A. Armstrong ...	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ...	Grobblar's Kloof.
		,,	Natives ...	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,,	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	Pepworth & Reid	Reitfontein
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner	Farm.
J. Chaplin ...	Klip River ...	Lungsickness	J. Peniston ...	Reserve
		,,	J. Van Whye ..	Ladysmith T'Lands
		,,	G. J. Heslop ...	,,
		,,	H. E. K. Anderson	Gedula.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	G. F. & J. Woodhouse	Davel's Hoek.
		,,	Natives ...	Georgina.
		,,	G. J. McDuling ..	Waterford.
		,,	Natives ...	Langverwacht.
		,,	,,	Vertrek.
		,,	Nondo Gama ...	F. J. Dewaals' f rm
		,,	A. Boers, & Native	Marais Vel.
		,,	W. Neizel, & Natives	Roosboom.
		,,	Natives ...	Doornkraal.
		,,	E. Walker ...	Doornkloof.
		,,	J. Umpbleby ...	Springfield.
		,,	F. N. Nel ...	Catherine.
		,,	Natives ...	Macpherson'a farm.
		,,	P. Ruiter ...	Ladysmith.
		,,	Mdhlondhlo ...	Blaaubank.
		,,	Jobisa ...	Lombard's Kop.
		,,	Nosubala ...	Weltervreden.
		,,	H. E. K. Anderson and others ...	Dewdrop.
		,,	Nondabola ...	Zwaart Kop & Dew Drop.
		,,	— Sandals ...	Home Farm.
		,,	Natives ...	Jonono's Kop.
		,,	B. G. Zietsman ...	Bosberg.
		,,	Natives ...	Roodepoort.
		,,	W. Cochrane ...	S. Wiltshire's farm.
		,,	J. de Jongh & Natives ...	Potini Spruit.
		,,	Natives ...	Reit Kuil.
		,,	A. S. McHattie ...	Wessel's Nek.
		,,	Cory & Long ...	Ladysmith T'Lands
		,,	Henderson ...	Weltervreden & Paarde Vort.
		,,	Scomber ...	Kleinfontein.
		,,	G. Robinson ...	Little Magara.
		,,	Natives ...	Dreifontein.
		,,	J. Farquhar ...	Stuart's Park.
		Scab	J. H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson ..	Walker's Hoek.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	G. Wetherill ...	Walker's Hoek.
		,,	A. Krogman ...	Brakfontein.
		,,	M. W. Krogman...	Dreifontein.
		,,	P. Marais ...	,,
		,,	H. Boers ..	Dew Drop.
		,,	G. Spearman ...	Feir View.
		,,	J. Van Reenen ...	Wessel's Nek.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Scab	A. Boers ...	Marais Vel.
		"	A. Carbutt & J. Good	Matiwaan's Hoek.
		"	Sparks Bros. ...	Ladysmith.
		"	J. de-Waal ...	Blaubank.
		"	F. J. de-Waal ..	Lombard's Kop.
		"	G. Innes ...	Eland's Laagte.
		"	J. Umpleby ...	Springfield.
		"	A. J. Taylor ...	Arnot Hill.
		"	R. Horsley ...	Warrock.
		"	Dr. Helps ...	Roosboom.
		"	Corrigel ...	Koolfontein.
		"	Cockrane & Illing	Dansekraal.
		"	J. Dryer ...	"
		"	J. Dryer ..	Aller Park.
		"	H. S. Bowers ...	Zaaifontein.
		"	A. Henderson ...	"
		"	A. Henderson ...	Eenvogle Vlei & Elandslaagte.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	H. F. Pearson ...	Everton.
		"	W. Caldwell ...	Stamford Hill.
W. Freer ...	Upper Tugela ...	"	Natives ...	Umini Location.
		"	Borbasee ...	Vrom Draai.
		"	S. Sharratt ...	Klein Waterfall.
		"	Natives ...	Green Point.
		"	A. H. Coventry ...	Earthcote.
		"	Mdhlenjana ...	Mooi Hoek.
		"	P.W. Dept. ...	Acton Homes.
G. Gielink ...	Zululand ...	Scab	J. M. Wales ...	Fairleigh.
		Lungsickness	M. Titlestad ...	Ntingwe.
		"	Dinizulu ...	Hlabisa District.
		"	Noiwana ..	Nqutu.
		"	Natives' Cattle ...	Melmoth.
		"	Sebambindoda and Natives ...	Kwamagwaza.
		"	G. Havemann ...	Insuzi.
		"	Military Loot Cattle	Warbeck, Elizabeth and Barneveld Melmoth.
		"	Damusa ...	near Melmoth.
		"	Ndabazeywana ...	Nqutu.
		"	Strachan ...	"
		"	Jacob ..	Vant's Drift.
		"	M Bube ...	"
		"	Surrendered Boers	Hlabisa.
		"	Lufahla Usutu ...	Nqutu.
		"	F. W. White ...	Melmoth.
		"	G. Muller ...	Near Melmoth.
		"	C. Green ...	Inyoni.
		"	Liversage & Van Rooyen ...	Umhlatuzi.
		"	Surrendered Boers	Eshowe.
		"	Mtantana ...	Telezi Ridge, Nqutu
		"	Mhlamb ..	Sihlunegwana Hill.
		"	Sub-Inspr Lewis, NP	Melmotq.
		"	Surrendered Boers	Port Durnford.
		"	H. T. James ...	Prospect.
		"	J. Fry ...	Nkandhla.
		"	M. Van Rooyen ...	Mahlabatini.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
G. Gielink ...	Zululand ...	Lungsickness	Res. Magistrate ...	Mahlabatini.
		,,	Sgt. Evans, N.P....	,,
		,,	P.W. Dept. ...	Eshowe.
		,,	F. A. Ortlepp ...	Saxony.
		,,	A. Barklit ...	Nqutu.
		,,	Military Cattle ...	Eshowe.
		,,	B. Green ...	Inyoni, Umlalazi
		,,	W. Magee ...	Mlalezi, Eshowe.
		,,	Pietekatonga ...	Nqutu.
		,,	Arnold & Rorck...	Mlalezi, Eshowe.
		,,	Natives ...	Nkandhla.
		,,	— Corbett ...	Eshowe.
		,,	J. R. Nel & Van Rooyen ...	Ndule's Location, Nkandhla.
		,,	E. Loffer & Natives	Mahlabatini.
		,,	P. Zietsman ...	Nkandhla.
		Scab.	Surrendered Boers	J.R. Ortlepp's farm
		,,	W Pretorius ...	Warnbeck.
A. Klingenberg ...	Umsinga ...	Lungsickness	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
		,,	Mrs. H. Strydom...	Uithoek.
		,,	Ngobazane ...	Vermaak's Kraal
		,,	Usiquantjee ...	Emsita.
		,,	A. Müller ...	Pression and Buffalo Home.
		,,	M. Shebele ...	Freiburg.
		,,	Dr. J. Dalzell ...	Gordon Memorial M.S.
		,,	H Stegen & Natives	Craigneathen.
		,,	H. Dedekind ...	Buffalo Home.
		,,	T. Keyter	Pomeroy Town Lands.
		,,	T. Crooks	
		,,	Botha	
		,,	Westbrook Bros.	
		,,	N. Smit ...	Tugela Ferry
		,,	J. Benecke ...	Stone Hill.
		,,	Nqala ...	Location.
		,,	C. P. K. Vrey ...	Kalkfontein.
A. J. Marshall ...	Dundee ...	,,	Marshall Bros. ...	Cleveland.
		,,	— Haynes ...	Sterkstroom.
		,,	Military Authorities	Maypole.
		,,	Glutz ...	Rocky Glen.
		,,	Thorn ...	,,
		,,	Natives ...	Craigieburn.
		,,	J. Landman ...	Boschfontein.
		,,	J. Davidson ...	Beacon Hill.
		,,	Natives	Long Land.
		,,	,, ...	Carolina.
		,,	,, ...	Renier.
		,,	L. Hedder & May	Roadside.
		,,	Natives ...	Kelvin.
		,,	,,	Uitsay.
		,,	A. Jansen ...	Sheepridge.
		,,	Natives ...	Navigation Colliery.
		,,	F. Payne ...	Glencoe.
		,,	N. Glutz ...	Swiss Valley.
		,,	J. W. Dupreez ...	Jackalsfontein.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ...	Dundee ...	Lungsickness	C. F. Van Rooyen	Davelsberg.
		,,	Lyle & Sangster...	Dundee.
		,,	Charley ...	Woodlands.
		,,	Umzagaza ...	Morgenstont.
		Scab	A. Jansen ...	Sheepridge.
		,,	J. H. Erkland ...	Carolina.
		,,	F. J. deWaal ..	,,
		,,	J. H. Reis ...	Longfontein.
		,,	J. W. Dupreez ...	Jackalsfontein.
		,,	D. Opperman ...	Gedull No. 2.
		,,	M. J. Herbert ...	Vermaak's Kraal.
		,,	H. J. Hearn ...	Hatting Spruit.
		,,	Gouws Bros. ...	Kelvin & Kilburne.
		,,	N. Glutz ...	Swiss Valley.
		,,	C. F. Van Rooyen	Davelsberg.
		,,	Maritz & Thornhill	Aletta.
		,,	W. V. Marshall ...	East Lynne.
		,,	P. J. Gouws ...	Uitflucht.
		,,	H. Harris ...	Sterkstroom.
		,,	Murray & Co. ...	Navigation Collieries
		,,	J. J. Uys ...	Verdenk.
		,,	P. H. Swart ...	Hartebeestefontein.
		,,	H. J. Nel ...	Blinkwater & Evansdale.
		,,	A. G. Vincent ...	Craigieburn.
		,,	D. Meumann ...	Waterfall.
		,,	Turnbull & Co. ...	Washbank.
		,,	Peerbhoy ...	Dundee.
W. A. Hutchinson	Alfred ...	,,	H. J. Hearn ...	Double Kraal.
		,,	W. Stafford ...	Sutherland.
		,,	Nqubu ...	Location.
		,,	Ngihla ...	St. Mary's.
		,,	Makubana ...	Amaci Location.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	Natives ...	Hungerspoort.
		,,	A. P. Vandermerwe	Poortje.
		Scab	A. J. Harding ...	Zwart Kop.
E. Varty ...	Umvoti—Western Portion	,,	J. M. & J. C. Van Rooyen ...	Pampoennek,
G. N. Perfect ...	Umvoti—Eastern Portion	,,	Thos. Hill ...	Stolzenvels.
F. E. Van Rooyen...	Kranzkop ...	Rinderpest	Natives Cattle ...	Sobuza's Location.
		Scab	L. J. Potgieter ...	Broedershoek.

The whole of that portion of the Colony north of the Tugela River and the Province of Zulula have been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
31st July 1901.

M. J. HIME,
for P. V. Surgeon.

Tasmanian Blue Gum Timber.

THE following correspondence is published by order :—

Department of Lands and Surveys,
Lands Office, Hobart,
13th June, 1901.

Sir,—I have the honour to forward you a copy of a letter which I am sending to the Editor of the "Natal Mercury" re Tasmanian Blue Gum Timber, and as the "Agricultural Journal" is mentioned as having published the statement complained of, may I ask you to kindly give publicity to my letter in your official journal. I beg to forward you a copy of the Crown Lands Guide for 1901 referred to in my letter to the "Mercury."

I have, &c.,

E. A. COUNSEL,
Surveyor-General and Secretary for Lands.

The Secretary, Department of Agriculture, Natal, South Africa.

Department of Lands and Surveys,
Hobart, Tasmania.
12th June, 1901.

Sir,—My attention has been called to an article appearing in your journal of the 9th of April, 1901, in which the Hon. Moor's impressions of industrial Australia are set forth at some length, and the intimation that his views are published by order in the "Agricultural Journal," would appear to indicate that considerable publicity has been given to his writings. He is quoted as having on several occasions obtained from Mr. Maiden, the Curator of the Botanic Gardens in Sydney, N.S.W., expressions of "regret that we had introduced the Tasmanian Blue Gum (which is regarded as one of the most useless of the Australian woods) into our Colony, a mistake which they said had also been made by some of the European countries."

Such a statement, coming from this source, would very naturally prejudice buyers against the timber referred to, and as it is expected in the near future that a large trade will be opened up for Tasmanian timber in South Africa, I hope you will give equal publicity to this letter, and show your readers our side of the question. I have before me a letter from Mr. Maiden, dated 6th June, 1901, in reply to mine asking if he was correctly reported in your journal, in which he states "that an opinion that the Tasmanian Blue Gum is one of the most useless of the Australian woods does not correctly express my views." In this respect, therefore, Mr. Moor's statement is not confirmed.

Mr. W. Heyn, of the Timber Department of the Admiralty Harbour Works, Dover, England, who is at present on an official visit to Tasmania, is purchasing large quantities of Tasmanian Blue Gum for his works, and writes me under date 3rd June, 1901, as follows, in reply to a request for his opinion on the timber referred to :—"I consider well-selected Tasmanian Blue Gum (Eucalyptus Globulus) far from being 'one of the most useless of the Australian woods,' as one of, if not the very best and the most useful for a great many purposes, such as Pile-driving (for which we are employing it on our Admiralty Harbour Works, Dover, England), Sleepers and Paving. Grown on proper soil, it attains to 75 specific gravity, and for size, strength, and durability, it would be difficult, in my opinion, to find any wood superior to it.

"I see no reason whatever why this valuable timber should not succeed well in Natal. It has been introduced with success into other parts of Africa, such as the Free State of the Congo, and Egypt, and also into India, and instead of 'being a mistake,' I have always understood that it has been most useful in many ways, not the least of which have been its deterrent effect on the spread of Malarial Fever, and its most beneficial influence on the general hgyiene of the districts in which it was planted."

The late Mr. G. S. Perin, F.L.S., F.R.G.S., F.R.H.S., Conservator of Forests in Victoria, says of the Tasmanian Blue Gum in his report of 21st May, 1886 :—

"The Blue Gum (Eucalyptus Globulus) of Tasmania is undoubtedly the best timber in the Colony for all important constructive works. Its hardness, density and weight, combined with lasting qualities of a high order, place it in the foremost position among Tasmanian timbers. For marine work it is particularly suitable, as its hardness of grain, together with the presence of kinotannic acid, wards off for a considerable time the attacks of marine insects, until, in fact, the sea water nullifies the effect of the acids contained in the wood, and thus opens the way to their destructive proclivities. The toughness and elasticity of the wood is another factor in its favour, as its capability of withstanding great transverse strain is remarkable, whilst its power of resisting a vertical or crushing strain is equally so, averaging 3.078 tons on one square inch in experiments on cubes of two inches."

Mr. R. M. Johnston, F.L.S., F.R.S. (Tasmania) describes the Blue Gum (Eucalyptus Globulus) as producing "a hard and heavy timber, very durable, and taking a high polish. It is stronger than English Oak, and may be used advantageously for any purpose for which Oak is used, i.e. :—For building ships, jetties, bridges, house frames, wagons, carts, plough and tool handles of all kinds. The grain is interlocked, so that it makes good felloes for wheels and railway sleepers. The young wood is straighter in the grain, and very suitable for cart shafts and anything that requires toughness, spring, and elasticity. This tree has been planted all over the world, in India, America, the Cape, and various European countries."

I send you a copy of the Crown Lands Guide, 1901, published by this Department, containing some characteristic views of the timbers of Tasmania, from an industrial aspect. The picture on page 32 represents some of the Blue Gum timber being obtained by Mr. Heyn.

In conclusion I would say that Tasmanian hard woods, including Blue Gum (Eucalyptus Globulus) and Stringy Bark (Eucalyptus Obliqua), are in much request in all parts of the world, and in the States of the Commonwealth of Australasia, where durability, toughness, spring and elasticity in timber are essential, and it was therefore noticed with the greatest surprise that contrary opinions had been expressed by one of your Colonists.

I have, &c.,

E. A. COUNSEL,
Surveyor-General and Secretary for Lands.

To the Editor, "Natal Mercury,"
Durban, Natal, South Africa.

(*To the Editor Agricultural Journal.*)

Sir,—We have seen the letter of the Surveyor-General, Tasmania, to the "Natal Mercury."

In our opinion Mr. Moor is quite right in what he says about the ordinary Blue Gum grown in the Colony (Eucalyptus Globulus). The timber is tough, but in our opinion intractable. We have tried tons of it, but can never rely upon its keeping the shape into which it has been worked. Possibly when growing naturally in large forests, and not felled till forty or fifty years old, and possibly also specially seasoned, the remarkable inclination to twist may be absent, but on that point we cannot speak from experience.

There are one or two other gums grown in the Colony which give splendid, useful timber, but not being certain, we do not commit ourselves to naming them.

Yours, &c.,

MERRYWEATHER & SONS,
Wagon Builders, etc.

Maritzburg.

Mr. Moor, on the invitation of the Editor of the "Mercury," made a short reply to the foregoing letter. He said. . . "It was far from my inten-

tion to say or do anything which would prejudice the sale of timber, or any other product, of the Australian States in South Africa; but, as in duty bound, I pointed out to my fellow-Colonists that I was strongly advised by several not to recommend the planting of the Tasmanian Blue Gum for timber...

Systematic Afforestation.

(By G. H. Davies, Forest Ranger, Qudeni.)

IN a report of a meeting of the Lower Tugela Division Association recently held at Stanger, there was a discussion on the subject of foresty, which dealt more thoroughly with the question than other Agricultural Associations have done as yet. The necessity of preserving the native forest we already possess was not lost sight of in considering the need for the general afforestation of the Colony, and, doubtless, the speakers at the meeting were aware that such wild bush is worth, climatically, acre for acre, a century's purchase of any new plantations.

Generally speaking, however, the Lower Tugela Association laid much stress upon the afforestation of Crown Lands. Any attempt to do this on a scale large enough to benefit the Colony climatically would have to meet a formidable objection: Should all classes in Natal contribute equally to a work which would benefit the land-owners principally and most directly. In the first place, the mere locking-up of Crown Lands for permanent forest would enhance the value of every estate, and then that value would be automatically raised, as the new forests matured, by climatic improvement and facilities for obtaining timber. It seems, therefore, obvious that a fair scheme for afforestation should provide that the public purse should only be called upon to subsidise afforestation, and not to bear the whole cost.

Should the fair instance of the financial burden be arranged, there yet remains another objection to the confining of an afforestation scheme to Crown Lands. A glance at a map of the Colony will show what this is—to those who do not suppose that land-owners can be left to afforest their own estates, without any inducement to do so but a low return on the capital expended about twenty years hence. A supply of poles and fuel, and an ornamental flourish to an estate, can be easily obtained by a few thin belts of wattles or other rapid growers; but afforestation demands solidly planted areas of good breadth, with slow-growing species that protect rather than exhaust the springs, and, shading the ground for sixty and more years, are then only removed in their ripe maturity to make way for others like them, ready to support the ever-green canopy. There is little show in this to put in the auctioneer's picture of a desirable property—short-lived wattles, which are ever making the demands of a new crop upon the water supply, will look as well. However desirable real forest may be, it will take a land-owner half a century to produce a semblance of it, and a great deal longer to equal, climatically, real old bush with its carpet of humus to absorb and store up the surface water.

The real position, therefore, is just this: The Colony cannot afford the cost, out of its public funds, of a thorough scheme of afforestation, and, if it could, the afforestation of Crown Lands alone would not meet the real requirements of the case—the climatic improvement of Natal as a whole, by the establishment of a fair proportion of forest to open land throughout the Colony. Further, the land-owners, unassisted, cannot undertake a work which, beyond all other, requires permanency both of effort and of maintenance, and of which the direct re-

turn in cash must be small and long-delayed.

The true solution of this question seems to lie in a combination of the land-owners with the assistance of the Government, under a Forest Law which would provide for the permanent maintenance as forest of land voluntarily afforested by the owners; and which, while interfering with no rights of property but the right to disforest, would compensate land-owners for yielding that right, by contributing towards the expenses of afforestation and maintenance. Such a forest law could, with advantage, be made to include provisions dealing with the conservation of indigenous forest, and with the establishment of new forest upon Crown Lands; but, unless it also provided means—acceptable to the land-owners—for the afforestation of the vast areas of poor lands in private hands all over the Colony, it would be incomplete. No scheme of afforestation that does not include alienated lands can much benefit Natal climatically, while the direct cost to the public purse of the afforestation of Crown Lands will prevent any great area being planted. For instance, the afforestation of, say, five thousand acres by land-owners would mean comparatively little actual expenditure individually — most of the contributions being in work done in slack seasons — but Government would have to pay in cash for nearly every item, and then wait for years for a return of the capital. We have native forests much larger than five thousand acres, and our first duty is to conserve them; but next to that we should encourage private enterprise, and so place the new forests where their climatic benefits are chiefly required.

Correspondence.

To the Editor Agricultural Journal.

DEAR SIR,—I would like your advice on the following:—I want to plough up my mealie lands as soon as we get the first spring rains, and put in some fast growing plant to plough in later on, when I sow my mealies. What can you recommend for this? Would "Johnson Grass" be good? If yu think this or any other thing would suit, would you please give me particulars as to what price per lb. of seed, how much to sow per acre, and where seed can be obtained. Is "Johnson" Grass the same thing as the Millet one sees advertised for sale? I am in the Noodsberg district, and grass, etc., seems to spring up and grow very quickly in the early spring. The soil is very sandy, and rather poor. Do you think it would pay me to apply "Basic Slag," so as to induce a big growth of grass as quickly as possible? I would probably want to plough in after the grass had been sown about six weeks. I grew a fairly good crop of mealies this season on the ground. I gave a moderate dressing of bone dust.

I am, &c.,

T. L. FYVIE.

Fawn Leas, Noodsberg.

[Our correspondent apparently wishes to find some nitrogenous plant to sow in early spring for the purpose of ploughing in as green manure at the time for sowing his mealies. If there is any such grass, which we much doubt, perhaps some reader will be good enough to communicate his knowledge to the "Journal." Failing such information, our correspondent should plough up his land as soon as rain, or the nature of the soil, permits. Johnson Grass is catalogued by Messrs. Anderson, of Sydney, N.S.W., among Millets, although it is not specifically described as a millet. Basic Slag, of good quality, is an admirable fertiliser, and in all probability would give him excellent results. If he has not experimented with it, or seen its effect on land similar to his, he would do well to send a sample of his soil for analysis to the Departmental Chemist. — Ed., "Agricultural Journal."]

The profits of the South African Breweries Company for the last year were £145,941.

In the last issue we omitted to state—which, however, was fairly obvious from the general tenor of the remarks—that the two naartje trees photographed were of the same age.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write :—Notwithstanding the fact that many farmers questioned the assertions made by ourselves and your Durban correspondent, that there would be a very heavy crop of mealies, there is every indication that what was predicted has been realised. It is years since so many mealies have found their way into Maritzburg during the months of June and July, and as numbers of farmers have not yet offered their crops for sale, and as there is practically no outlet for accumulated stocks, there is every possibility of a decline in the price of grain.

Mealies.—On the market mealies have realised from 10s. to 10s. 6d. per muid, including sack ; 10s. 6d. is now about the average per muid.

Forage.—Very little offering ; 9s. has been obtained per 100lbs.

Hay.—From 1s. 10d. to 2s. 9d. per 100lbs, bedding from 4s. to 26s. 6d. per load.

Potatoes.—The several varieties offered have realised from 10s. 6d. to 18s. per 100lbs ; sweet potatoes from 2s. to 4s. 9d. per sack.

Beans.—Common red beans from 9s. to 14s. per 100lbs. Canadian Wonder, 17s. 9d. per 100 lbs.

Mabele. — Notwithstanding the large acreage under cultivation, and the phenomenal yield, nothing has been below 6s. per 100lb. ; some samples have realised 7s. 9d. and 9s. 6d. per 100 lbs.

Onions.—Some varieties have been as low as 12s. 6d. and 16s. 8d. per 100lbs. ; but good samples have realised 25s., 29s. 2d., and 33s. 4d., per 100 lbs.

Poultry.—Common fowls from 1s. 10d. to 3s. 7d. each, but good birds have realised from 4s. to 6s. 9d. each. Ducks from 7s. 6d. to 15s. 6d per pair ; turkeys (cocks) 12s. 9d. to 16s. each, (hens) 6s. 6d. to 7s. 6d. each.

Butter.—From 7d. to 2s. 5d. per lb.

Eggs.—From 1s. 8d. to 2s. 4d. per doz.

Vegetables.—Beans, beetroot, cabbages, carrots, celery, cauliflower, onions, peas, potatoes, pumpkins, tomatoes, and turnips have been sold every day.

Fruit.—Very few varieties offered now ; those sold consisted of apples, pine-apples, bananas, naartjes, oranges, and papaws.

Sundries.—Mutton from 4d. to 10d. per lb. pork, from 3½d. to 9½d per lb. ; beef, 7d. to 8½d. per lb. Several mornings fish was sold at prices varying between 1s. 3d. and 4s. 3d. each.

Wood.—From 6½d. to 11½d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes : -

General.—Trade is rather dull of late, and profits are being cut very fine. However, with the gradual return of the refugees, business with Johannesburg shows a continual and steady improvement, and this will serve to prevent any great trade depression.

Mealies.—The market is very dull, and there is an absence of any large outside demand. The great yield of the season is indicated by daily offers from farmers of large parcels, and but for the activity of speculators in buying up to hold, prices would be very low indeed. Scores of thousands of bags are being tanked on the coast, and it is a remarkable feature of this *fin de siècle* age, that Indians and Arabs constitute the biggest speculators in mealies. A good many thousands of muids of the old season crop are still held over from last year by speculators up-country. *Apropos* of this, I am informed that the Lion's River farmers, who lately petitioned the Government to induce the military authorities to buy mealies, are amongst the largest holders of old season's grain—now, probably, very weevilly.

Those speculators who held on to stocks when rates were as high as 16s. to 17s. per muid deserve no sympathy whatever, but nowadays many farmers pay more attention to gambling in grain than to legitimate farming. The result is that lately we have seen nearly one hundred thousand bags of American mealies in Durban, and, per contra, thousands of bags of Colonial grain rotting with weevil for want of buyers.

Farmers need not cry out to Jupiter—otherwise Government—to find them buyers. The writer is prepared to name a Durban buyer who will take ten thousand bags delivered in Maritzburg, at 10s. 6d. per muid, cash on delivery.

The Military authorities are buying all their requirements in Durban at an average of 10s. per muid.

Potatoes.—Colonial grown samples continue as before to bring top market figures, and prices range between 20s. and 23s. 6d. per bag of 150lbs. Supplies, however, are getting fewer and fewer weekly. Australian importations now practically hold the market, and following a strong rise in Australia, quotations are very firm to-day at £14 per ton.

Seed Potatoes for early spring planting are largely enquired for. Very few are to be had, and imported small lots of "Early Rose" from Australia command fancy rates.

Hay.—This is in great demand, but very little is on offer, as most of the holders are sending everything to Johannesburg.

Mabele. — The enquiry for Kafir corn is limited, and parcels are difficult to place. There is a large crop in the East London district, and in all probability shipments will be shortly made thence to the Port.

Bran.—This article is cheap and plentiful just now, owing to the great glut in the local market. Up-country farmers now have a favourable opportunity to lay in supplies. Quotations range from 6s. to 7s. 6d., according to quality. The former represent South American, and the latter Australian bran.

The Agricultural Journal

AND MINING RECORD.

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CONTENTS.

Horsesickness.

(By H. WATKINS-PITCHFORD, F.R.C.V.S.)

(Continued.)

WE now pass on to a consideration of the possibility of the disease being due to a cause gaining entrance to the system through the alimentary canal.

This I have termed the Ingestive Theory, from the possibility of infection through the mucous-membrane of the digestive apparatus — when in either a normal or an abnormal condition — including such possible factors as intestinal parasitism, etc. Infection through the mucous-membrane of the eye will also be considered under this head.

Popular opinion—based upon no scientific grounds, however—inclines to the idea that the disease is "picked up" by an animal when grazing upon food moist with dew. This evidence, as far as it is worthy of consideration, would point to the adoption of the Ingestive Theory, by which, through the medium of the stomach or intestines, the materies morbi gain entrance to the system.

Such an impression tends to become confirmed upon observing the undoubtedly specific part played by the in-

testinal tract in the course of the disease. In a very large percentage of the cases which have come under my notice within the last five years an intense gastro-enteritis has been present upon post mortem examination of the alimentary canal. So marked is this condition often that one cannot help being reminded forcibly of the post mortem appearance of a case of arsenical or other corrosive poisoning. That such a condition should be attributed to the ingestion of any directly acting cause — such as irritant food or direct microbic action — is negatived by the fact that these symptoms are frequent concomitants of the disease produced artificially by means of the hypodermic syringe. As this fact, which I consider of grave importance, seems wholly or in part to have been unnoticed by nearly all the workers with this disease, I wish it to be understood that these observations apply to the disease as manifested in Natal.

Such a condition, of course, does not negative the theory that the naturally produced disease may be contracted through the stomach or intestines, but it shows that the specific gastritis cannot be due to the ingestion of any directly acting cause

The incidence of zymotic diseases upon any particular organ or set of organs, is, of course, well recognised ; one recalls the nephritis of scarlatina, the endocarditis of rheumatism, gastritis of rabies, and—perhaps the most striking instance of the selective affinity of disease for specific local manifestation—the lesions of foot-and-mouth disease

The same obscure selectivness may account for the intestinal lesions of horse-sickness, and furnish an analogy for the presumption that such lesions may exist independently of any cause acting locally upon the mucous-membrane of the stomach or intestine

That with the ingestion of dew the organism gains an entry into the system seems improbable, for the infective cause indeed can be but seldom existant with or upon the dew, and this is evident, inasmuch as dew must, as an everyday occurrence, be ingested by animals turned out to graze. That such dew entangles or precipitates the organism from a considerable height is improbable, because dew formation takes place only from air-strata in contact, or nearly in contact, with the earth. This theory of precipitation from considerable altitudes seems also to be negatived when one considers the freedom from horsesickness experienced during rain.

The possibility of producing the disease through ingestion of infected material is well demonstrated, though whether such infection is possible in the presence of a perfectly normal gastric-membrane is still a matter for decision. In this connection we should bear in mind the instructive experiments made of late years, shewing how insusceptible animals can be made liable to certain diseases by introducing the organism into a stomach, the lining membrane of which has been rendered abnormal by the previous ingestion of lactic acid or other agent producing a slight degree of gastritis, or other abnormality.

The absolutely normal condition of the gastric membrane of the South African horse can but rarely exist where parasitic invasion of the alimentary canal is so universal.

If the stomach were the only medium by which the disease might be introduced some colour might be lent to this theory, but subcutaneous intravenous, and also intra-tracheal injections prove that the Ingestive Theory cannot be considered as the only theory at present tenable or capable of satisfying all the difficulties of this illusive disease.

Post mortem evidence seems to point to the fact that the stomach lesions produced by ingestion of infective matter are more severe than those induced in the natural course of the disease. In the case of one animal having received 150 c.c. of virulent blood the reaction was so great as to be described in the post mortem report as "showing the most marked inflammatory changes, patches denuded of epithelium, and small erosions. The colour, instead of showing the usual dark venous colour of gastritis, was of the brightest cherry red." In the duodenum

"actual erosions and loss of tissue" are noted. This appearance is produced by the introduction simply of a small quantity of virulent material into the stomach.

Contracting the disease by ingestion would seem to be a manner of infection, presenting none of the theoretical difficulties of the Inoculation Theory, did not one see the ease and certainty with which, under given conditions, this latter infection may be accomplished.

While the possibility of infection being able to take place in this manner is readily understood, the curious intermitting nature of the infecting cause is one of the points requiring elucidation before all the difficulties of the Ingestive Theory can find a satisfactory solution.

Agricultural Analyses.

By Archibald Pearce.

SOME few months ago—to be exact in the issue of March 29th—this Journal published a Report by the Government Chemist, containing the results of the analyses of eleven locally-sold fertilisers, together with an estimate of their commercial value. The other day I had the opportunity of seeing a similar report in the *Agricultural Gazette* of New South Wales, and though comparisons are proverbially odious, I could not help making a few. The *Gazette's* report contained analyses of no less than sixty-seven samples of manures (with a promise of more to come) and thirty-six samples of waste products, ashes, etc., which are used as fertilisers, stating also the value as estimated by analysis, the price on the market, and the name of the vendor. Such a report shows the importance attached in other countries to giving the users of fertilisers every opportunity of obtaining full information as to the quality of the goods they purchase. It must be clear, that if agriculture is to be run on economical lines, the farmer must get the best value for his money, especially in an investment which may easily run into three figures every year; and if these analyses are published regularly and completely, they form the best means by which so desirable an end may be attained. The word "completely" is to be taken to mean that practically all the fertilisers in common use in the Colony should appear in the lists, and the source from which they were obtained should be stated. It does not seem to my mind any injustice to the vendor to have his name given; if he sells a good article he gets a free advertisement; if otherwise, he deserves to be shown up and avoided accordingly; and so long as we have no law on the lines of the Fertilisers and Feeding Stuffs Act at Home, such publicity is the only protection against dishonest practices. That such protection is not unnecessary is proved by two cases which came under my own notice a year or two ago; one of a manure (now, I believe, no longer on the market) sold at about £10 a ton, which was certainly not worth more than £2, as shown both by analysis and practical results; the other of a sample of bluestone, supposed to be specially prepared for agricultural purposes, which turned out to be adulterated to the extent of 84 per cent. May we hope that the Agricultural Department will see its way to continue and complete the publication of these analytical results, as other countries are doing?

Perhaps a simple illustration of how these analyses may aid in the choice of fertilisers would be useful. Suppose a farmer proposes to use potash in a dressing for his potatoes, and is doubtful whether to apply Kainit or Muriate of Potash. The former contains about 13 per cent. of Potash, while Mr. Nevill's report shows that the latter contains about 60 per cent., or rather more than 4½ times as much. Kainit costs £3 17s. 6d. per ton, while the Muriate is worth £15, but if we multiply £3 17s. 6d. by 4½ it comes to £17 8s. 9d., showing that it is cheaper by £2 8s. 9d. to buy a ton of Muriate than if we bought the same amount of potash in the form of Kainit. Moreover, a further economy is effected by the saving in the freight of 3½ tons of manure.

I hope it will not be considered imper-

tinent, in connection with the money values attached to the analyses in the report to suggest that the Government Chemist should publish the scale of values which he uses to calculate the valuation of fertilisers that pass through his hands, and explain upon what principle they are arrived at. It is admittedly not an easy matter to fix on a valuation which shall fairly represent the cost of the various constituents, but I take it that the principle should be to use as a standard the market price *in the Colony* of each separate constituent in its simplest commercial form, and so realise as nearly as possible the ideal proposed in the report, namely, to represent the approximate value of the constituents of the manure under consideration. But if such has been the method pursued there are apparently some discrepancies which would be all the better for a little explanation. Why, for instance, should the nitrogen in manures be valued at about 12s. per unit, when nitrate of soda costs £14 10s., and sulphate of ammonia £19 10s., which works out at about 18s. 6d. per unit? And why, on the other hand, when muriate of potash can be bought for £15 a ton, equal to about 5s. per unit, is it calculated in the report at about 6s. 8d.? I suppose it is reasonable in this country, where the cost of lime is abnormally high, that its value should be included in the valuation of manures. It is so included at the Cape, but not in Australia, America, or England. But its inclusion appears to give in some cases what seems a somewhat fictitious value to certain fertilisers.

In conclusion, may I be permitted to say that it is in no critical spirit that these few lines have been written, but rather with the hope that some signs of interest in the publication of the report alluded to may encourage the continuance of a very useful work.

Locusts.

MR. STOCK INSPECTOR BROWN, Lower Tugela, on the first of the month reported:—No locusts have been seen during the month in this District. I have made enquiries about them towards Zululand way, and, as far as I can make out there are none anywhere about Lower Tugela.

Irrigation.

COLONEL CORBETT, the Irrigation Expert, will complete his term of two years' service with the Natal Government about the middle of November. Anyone wishing to consult him should therefore apply without delay. No fee is charged for this officer's services. Application should be made direct to Colonel Corbett, Department of Agriculture, Pietermaritzburg.

District Reports.

BULWER, August 8th. — During the last month there has been little to report. Calm, clear days, almost throughout the month, nights cold and plenty of frost. On the 28th there was a very slight drizzle and mist. Along the Drakensberg a good deal of snow fell, and it was exceedingly cold during the morning, but in the afternoon it cleared and became much warmer. Rain is badly wanted, everything is dry and parched. I never saw the veld looking worse. Notwithstanding this all kinds of stock look well, the sheep particularly so. Every flock I saw, while riding through the District, looked in good condition. Another case of lungsickness broke out in the farm Fairacres, I am sorry to say, the other day in a troop of cattle belonging to Miller Bros. Active measures were at once taken to stop the spread of the disease, and so far with success. I am glad to say the outbreak at Coleford has been stopped, and the cattle are all free from the disease. All other kinds of stock are free from disease as far as I know. A Stock sale was held at Bulwer on the 24th of July, of cattle belonging to Mr. Firmstone, of Ingogo. The prices realised were a long way below previous sales. During the last week the heat for this time of the year has been quite exceptional, the thermometer registering 85 degrees, at noon, in the shade, and the nights have lately been exceedingly close and sultry, with dense fogs or mists. If this kind of weather continues there will soon be grass springing up in the sheltered and low lying land. The ruling price of mealies is 13s. per bag for old mealies, and 14s. for the new mealies, or last season's crop. It is most difficult to get hay or any kind of fodder for cattle and other stock in the district just now.

H. W. BOAST, Magistrate.

INANDA, 9th August.—July has passed away without any rain here, which, I think, is a record, even for these latter day dry seasons. The consequence is that crops are suffering badly. The canefields are showing un-

doubted signs of distress. Such a long spell of drought is very much felt in Verulam, where the people have to depend upon rainwater conserved in tanks for their supply. With the exception of the few who have very large underground tanks, all have been buying water for some time. The water is brought in carts from Umhloti River, the cost being 2s. 6d. for a very small tankful of indifferent water. It is a pity the difficulty of bringing water into the town in pipes is so great. The township is so situated that there is no sufficient supply of water anywhere within many miles at a higher level than the town. To bring water into the town would, therefore, involve costly pumping works, which would be a heavy tax on so small a community. Here are a few meteorological observations made in July :—Rain, nil ; maximum temperature in shade, 82 degs. on 15th ; minimum temperature 44 degs. on 10th ; mean temperature for month. 61·6 degrees. There has been no rain yet this month, and the portents are not at all favourable. On the 6th inst., a very hot, north-west wind prevailed all day, the thermometer registering 96 degs. in the shade. This has done a lot of harm, coming, as it did, after a long spell of drought. This has been a record reason for oranges and naartjes, and they have been very fine, both in size and flavour. Our principal fruit grower in the Division, Mr. H. W. James, of Zwolle, had disposed of over 50 tons by the end of July, and expects his whole season's crop to top 120 tons, principally mandarin oranges. This is something like a crop of fruit, and shows what can be done. Yet, Mr. James cannot be said to be growing fruit on a large scale. Imagine what fruit-gardens could, with a little capital, be established along the banks of streams, where windmill pumps would render the growers more or less independent of the clerk of the weather. Mr. James' farm is, unfortunately, not so favourably situated, or the possibilities of Zwolle would be almost boundless. In my last notes I mentioned a new orange raised in this county, called the Natal Victoria. I am pleased to see that my remarks have received widespread attention, and a large number of persons (including a Cape man at present in Natal) have applied to me for the address of the grower. I have forwarded it to all. In my last remarks about the orange, I omitted to say that it does not fall from the tree when ripe so readily as the ordinary kind, and, when picked, will keep perfectly good and fresh for six weeks and upwards. It should, therefore, be an excellent fruit for export purposes. Locusts are on the move again. A large swarm passed over Verulam on the 7th inst., travelling towards Durban. There have been no further outbreaks of lungsickness in this Division since the one at Newlands, referred to in my last report. Stock is doing well, and with the advent of warm weather is not likely to fall off any more this winter. Trees are already assuming their spring garb of green, and the coast eating peaches have finished blossoming. The mango trees are covered with a thick mass of blossoms, and, all going well, should yield a very heavy crop. Last summer the mango crop was a light one. Vegetables are plentiful, and the cauliflowers and cabbages are unusually fine — all grown by Indians, of course.

JOHN L. KNIGHT, Magistrate.

NEW HANOVER, 12th August.—With the exception of influenza among horses, stock is healthy, although not in good condition. The weather is very dry, and farmers are anxiously waiting for rain. There is a continual strong wind blowing which makes it difficult for farmers to burn grass without endangering the safety of kafir huts and their neighbours plantations. Labour is very scarce.

A. RITTER, Magistrate.

NEWCASTLE, 8th August.—Scab and lungsickness are still very prevalent here. I am afraid it will take some time to stamp such out, owing to captured and loot stock continually being brought into this Division, which are more or less infected with the several diseases. Poultry and produce are still retaining high prices. Cattle and sheep are in a very poor condition owing to the bareness of the veld ; but as I predicted in my last report there are every signs of an early spring. The young grass is trying to get up, and requires only a few good rains to put everything right, when we shall have an abundance of grass in a very short time. There is a lot of cattle-stealing going on here, and great praise is due to the Natal Police for the way they are trying to catch the culprits. Farmers and others should be impressed of the great necessity that the slightest clue they may have of cattle stealing to report the same immediately to the police, when, I am sure, they will use their best endeavours to ferret the matter out, being always ready to assist. By the way, they are very short-handed at present. A police station has just been established at Dannhauser, which will prove a great boon to farmers and the public in general. Farmers are suffering a great deal of inconvenience with their servants at the present moment ; they (the servants) appear to take advantage of the disturbed state of the country. They will not work, and still have all the benefit of the occupation of their master's farms. The masters cannot turn them off, unless another place is found them, and then not without the permission of the military, who cannot allow Natives to wander all over the country. This the Natives are aware of, and so take advantage of the situation. It is certainly a very great hardship on the farmers, and they have good cause to complain as they do ; however, I suppose, war creates many unpleasantnesses. The health amongst the inhabitants of the Division is remarkably good. Martial Law still prevails here, the getting about from place to place on account of passes is a little bit inconvenient, but all will admit the Military are doing their best to make the inconvenience as light as possible, and cause as little discomfort as far as it lies in their power.

GEO. BRUNTON WARNER, Acting Magistrate.

NKANDHLA, 31st July.—Little or no rain has fallen during the month. Up to the 15th

the weather was quite warm, but since that date it has been very cold. I regret to report that lungsickness is on the increase. There have been four cases of fresh outbreaks, two of which were amongst local Native cattle. The infected herds under license in the District at the present time are Havemann Bros., Insuzi; P. E. Zietsman (one herd); Colonel Bottomley's cattle, Mfongosi; J. H. van Rooyen and J. Nel, Rooi Drift, Tugela; C. R. S. Hyslop, J. Hutchinson, and J. Fry, Empandhleni; T. W. Cooper, Mfongosi; Mabambeni Chief Siswana, near Magistracy; and Sikonyana, Chief Matshanaka, Sitshagya. Mr. J. R. Cooper, Acting Stock Inspector, arrived here on the 29th instant, and is busy visiting the infected herds. The veld is very bad, especially in the neighbourhood of the Magistracy. Things remain much in the same unsettled state along the Border. The Boers have taken several mares and foals from the Natives. Mr. Owen's store and buildings at the Upper Umhlatuzi have been almost entirely ruined by the enemy. On the 3rd inst. I collected hut-tax from the Natives of the Border Chiefs at the Insuzi Store, thus completing the collection from all the Chiefs in the District, the amount collected up to date being £5 064 odd. This is very favourable as compared with last year. The health of the District cannot be said to have been good, bad colds and dengue fever having been prevalent. No locusts have been reported in the District.

C. C. FOXON, Magistrate.

UBOMBO, 1st August. — The weather throughout the past month, though rather chilly at times, has been pleasant. But little rain fell, only ·14½ inch being registered. The minimum temperature was 47 degrees, and 79½ degrees the maximum. Owing to the late rains peaches have blossomed and fruited, and it is feared the crop will be a bad one this year, consequently. Mulberry trees, moreover, are almost in full leaf, and herbage generally much greener than usual at this time of the year. Five head of cattle are known to have died from gallsickness. Crops of all cereals and vegetables on the mountain have been harvested, save pumpkins, in many places—the crop thereof being in excess of that usually produced. In the low country to east of Magistracy, crops of native millet and mealies still remain green.

A. R. R. TURNBULL, Magistrate.

UMLALAZI, 10th August.—I regret being unable to report favourably on the condition of stock, as, since my last report, lungsickness has appeared in several parts of the District, chiefly amongst the cattle of surrendered Boers, at present stationed here. The infected herds are still in quarantine, and I fear it will be some time before the District is free from this disease. In addition to lungsickness, several deaths among cattle have occurred from anthrax. It may not be generally known that the flesh of cattle dying from this disease is exceeding unwholesome. Indeed, the Stock Inspector informs me that he has known of several natives dying as a result of eating it; and it is difficult to prevent their doing so, though I have repeatedly warned them of the probable consequences. I have heard of no diseases among horses lately. The merino sheep do not thrive here, but the natives breed a few of the common black and brown native sheep, which appear to do well a few miles inland. Weather.—The early coast spring is already with us, and everywhere ploughing and planting is going on apace. The first week of this month was very hot, and the high north winds have again commenced. Over 5 inches of rain fell during June, but only ·93 inch was registered for July. Very heavy dews have been observed during the last few weeks. There is nothing to report regarding crops, save to remark that the natives are breaking up a good deal of new ground and planting mabele largely, encouraged, probably, by the abundant crops reaped last season. Through the courtesy of Mr. M. Coates, at present of Matikulu, I have obtained a very fine sample of arrowroot, grown near the Matikulu River in this District. The root measures nearly two feet in length, with a maximum diameter of two inches, and weighs about 2 lbs. As this was grown by natives, without any special care, probably still better results would be obtained were the plant properly cultivated in that locality. Whilst travelling recently between the Umlalazi and Umhlatuzi Rivers, I notice great numbers of the Ilala Palm tree (sometimes called Vegetable Ivory), flourishing and covering a considerable tract of land. They yield a prolific crop of fruit, each containing a very hard white substance, resembling ivory in appearance. I am informed that a palatable alcoholic drink is obtained by tapping the trunk of the tree, and allowing the juice, which exudes, to ferment. The tree itself is very graceful in appearance, and contains a quantity of strong fibre in its branches.

J. J. JACKSON, Magistrate.

WEENEN, 9th August.—A spell of warm weather has now set in, and it is reasonable to suppose that we have done with frost and ice for another nine months. The past winter has been characterised by unusual severity, the thermometer having registered a lower minimum temperature than any recorded since 1897. To this fact is probably due the absence of the strong north winds, which are, as a rule, the prevailing feature of July and August. As is generally the case in The Thorns, stock of all kinds has done well in spite of the cold, cattle being in particularly good condition. During the past fortnight a large troop of horses, variously computed at from 1,000 to 1,400 has been depastured on the Weenen town lands, and these animals must be excluded from the condition of well-being just referred to, as they are dying in large numbers from poverty and other causes. Scab among the sheep flocks in the District is lessening, and no further cases of lungsickness have been reported. A suspected case of rinderpest caused a flutter of excitement among cattle owners, but the arrival of the District Veterinary Surgeon, who reported that death was due to other causes, restored the local peace of mind. Tobacco

growers are busy with their nursery beds, and if their present anticipations are fulfilled the crop for the ensuing season should more than double any previous output An engine is being imported by Mr. Stevens in connection with his tobacco and snuff manufactory, which will doubtless effect a saving of labour, for this industry, in common with most others, is greatly hampered by the unwillingness of natives to work unless compelled to. The residents of Weenen have noted, with satisfaction, that tenders for a postcart between Estcourt and Weenen have been called for. Another source of gratification is the acceptance of a tender for the earthworks of the new furrow, which it is hoped will now shortly be commenced.

C. G. JACKSON, Acting Magistrate.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 18th September next :—

Weenen. — Dark-brown mare, star on forehead, front left fetlock white, hind right leg white stocking, slit in each ear, about 13.3 hands, seven years old, with a yearling dark-brown entire foal, star on forehead, right hind fetlock white.

Estcourt.—Bay mare, black points, sore back, faint star on forehead.

Moss Dale.—Two black-and-white oxen, no brands ; small yellow ox, no brands ; black-and-white ox, no brands : red-and-ox no brands ; yellow ox, white legs, no brands ; red ox no brands ; black-and-white ox, no brands ; black-and-white brindled ox, no brands ; large black-and-white ox, no brands ; red ox, no brands ; white ox, red spots, no brands ; red ox, white under belly, no brands ; black-and-white cow, spotted, no brands ; dun-and-white cow, no brands ; red cow, spotted face, no brands ; two black cows, no brands ; black cow, white under belly. white face, no brands ; black heifer, slit in right ear, no brands ; black-and-white brindle heifer, no brands ; black-and-white heifer, no brands ; red heifer, no brands ; black yearling heifer, no brands ; black-and-white yearling bull, no brands ; two black yearling oxen, no brands ; black-and-white yearling ox, no brands ; red ox, two years old, no brands ; black ox, two years old, no brands ; yellow ox, two years old, no brands ; black yearling bull, no brands ; 31 Angora goats, horns painted red about two inches from the head up, different ear marks ; black-and-white bull, about four years old, no brands. Value about £5.

Ndwedwe.—Brown mare mule, white belly and nose, two undistinguishable brands on both hind quarters. Property of P.W D. ; white gelding mule, banded ⌐ on near hind quarter. Property of P.W.D.

Boston. - Black filly, about three years old, no brand visible. Only one eye.

Howick.—Black ox, branded 13 on left hip ; black ox, no brand ; black ox, no brand ; black-and-white ox, no brand ; brown-and-white bull. Probable value £10 ; running on the farm Brooklands, The Dargle, bay mare, light points, with long tail, unbroken, above five years old, no brands visible, with dark bay foal, about nine months old.

Umsinga. — Dun-and-white heifer ; black heifer ; red heifer ; black itole, white tip to tail ; black itole, white mark on face ; bay mare, 14.1, faint broad arrow off rump.

Springfield.—Black ox, forward horns, slight white under belly, branded FG ; black ox, forward horns, branded X ; black ox, up horns, branded FG ; blue mare, thin, long tail, no brands. Running on D. Brown's farm, "Glenare," blue mare, very thin, branded SL indistinct.

Ladysmith.—Bay gelding, tail and mane medium length, about 14½ hands high, no brands visible, poor in condition, near fore foot slightly deformed ; Dun or mouse-coloured mare mule, near foot badly deformed, with old sore, no brands visible.

It is a curious fact that underground draining or tilling regulates the humidity and temperature of the soil. During wet weather the surplus water is carried off by the drains, and when the weather is dry and warm the air (being moist) enters the drains, becomes cooled, parts with some of its moisture, and thus maintains a damp condition in the soil. When the soil is acrated, even by cultivation, a similar condition of soil is maintained—absorption of moisture from the air in summer and abstraction of moisture from the soil in winter.

The Best Pigs for Bacon.

AN interesting pig-feeding experiment was recently carried out by the Government Agricultural College, Hawkesbury, Australia, the object being to test the relative merits of different breeds of pigs for bacon-curing purposes. The experiment was conducted under the supervision of the principal of the college, Mr. Valder, who has given an account of the results at present obtained. Four distinct breeds of pigs are ordinarily kept at the college, viz., Yorkshires, Berkshires, Tamworths, and Poland Chinas, and from among these a well-known Sydney bacon curer was entrusted with the selection of a number for the purpose of experiment. The gentlemen in question selected two Berkshires, two large Yorks, two Tamworths, one middle York, and one cross between a Yorkshire and a Berkshire. These were fed in the same way from the date of birth till slaughtered at ages ranging from seven to eight months, when they were found to cut up as follows :—

Breed.	Age.	Aver. Live Weight.	Aver. Dead Weight.	Av r. Yld. of Ba on
	Mths.	lb.	lb.	lb.
Berkshires ...	7	166	112	72½
Tamworth ...	8	226	145	106½
Large Yorkshire ...	7	172	122	89
Mid. Yorkshire	7	160	104	89
Yorkshire-Berkshire ...	7	169	112	92

The results showed that well-bred pigs of all these breeds will be sufficiently heavy at seven months for market purposes if liberally fed. From the weights given above it would appear that the Yorkshire-Berkshire gave by far the heaviest percentage of bacon, and the Berkshire the lowest. But it is hardly fair to judge by a single test, especially when so few animals were used, as so much depends upon the individuality of the animal.

Representatives of the leading wholesale and retail bacon dealers of Sydney, after careful consideration, placed them as follows :—1. Berkshire ; 2, Yorkshire-Berkshire ; 3, Tamworth ; 4, Large Yorkshire ; 5, Middle Yorkshire. The judges were of opinion that had the Tamworths been killed a month earlier they would have taken a higher place. The Berkshires and the Yorkshire-Berkshires were pronounced to be of splendid quality, and very suitable for the Sydney market. The Yorkshires, although showing meat of excellent quality, had too large a percentage of fat.

In a special report on the test the representative of the bacon curers said :—"For quality the Berkshires had the advantage, as when cut the meat showed a proper streakiness, besides being fine in texture. But had the Tamworths been killed at the same weights as the Berkshires they would in all probability have given quite as much satisfaction in this respect. Generally speaking, I consider that the Berkshires are the best pigs from a bacon curer's point of view, as the ham is more plump and saleable than that of the Tamworth. I also believe that a cross between these two breeds will produce one of the most useful types of bacon pig. The Yorkshire-Berkshire sent produced a good saleable bacon, but the pure-bred Yorkshire were much too fat for the local market. It seems to me that from a breeder's point of view the Tamworths were a long way in front of the others, but, of course, it would hardly be fair to come to any decision on this point until some of the other tests are completed."

Dr. John Hay, proprietor of the Berry Central Creamery, one of the largest and most complete establishments of the kind in New South Wales, is a strong advocate for pasteurisation of milk intended for butter-making. Speaking at the annual dinner of the suppliers to the central and supplying factories, he told the farmers that he received a clear ¼d. per pound more for pasteurised butter than for their best quality ordinary butter. This represented £4,500 during the year. The primest pasteurised butter realised ¾d. per pound and the next quality ½d. per pound above ordinary top market rates. Two years since pasteurising of milk was adopted at some of the supplying factories, and Dr. Hay said he was a stronger advocate than ever of the practice.

The Breeding of Saddle and Harness Horses.

By Fred. Hutchinson, M.R.C.V.S.

(*Concluded.*)

The Coach Horse.

THIS is one of the oldest breeds about which we have any record. This class again may be divided into two classes, viz :—The Cleveland Bay and the Yorkshire Coach-horse, and, again, like the Hackney, the Yorkshire horse is nearer allied to the thoroughbred than the Cleveland. The Yorkshire Coach-horse Society also admits of one cross of thoroughbred in every three, and a good animal of this type has the appearance of a heavily built thoroughbred, the one exception being that a good specimen is possessed of fine stepping action. He is a class of horse that mates well with the Native bred mare, and is the means of procuring exceptionally fine double-harness horses for the heavier class of carriage work. He is possessed of one distinct qualification which no other breed possesses, he is bred to colour, being either whole bay or brown with black points, which has been continually preserved and bred to for generations, and thus is more liable to transmit this colour to his progeny, which is a distinct advantage in the breeding of match pairs. He is the best type of the larger carriage horse, with the magnificent turning and action that commands the highest price. There is nothing like them for carriage purposes to be found anywhere else in the world. The great advantage of this breed is that, should the stock turn out deficient in action or form, their size will find a ready sale for many purposes for which an animal lighter than a cart horse is needed in all countries. To the reader who wishes to enquire into history and marvelous distances covered by animals of this old breed in pre-railway times, he will find the first volume of the Coach-horse Stud Book very interesting reading.

The first horse advocated as a sire in this paper is thoroughbred, and in a certain sense so are the two latter, that is, their blood has been carefully kept, and mated with similar blood and a pretty exact type of animal (and in the Coach-horse of colour) has been continuously preserved and adhered to. These qualities are in the breeds by reason of their having been in the back blood, and, therefore, as any observant breeder will know, these sires are much more likely to procreate these qualities in their stock.

The reason which may be given for having somewhat retarded the general adoption of the latter two breeds in this country has no doubt in a great measure been caused by the introduction of the breeds in the shape of inferior specimens, and which (especially in the case of the Hackney) have often been thick-necked, heavy shouldered, round or carty quartered, of a most inferior type, which in many instances have been simply "planted" on Colonial buyers who have had no means of ascertaining the true characteristics of the respective breeds. These animals are commonly known in horsey parlance as "misfits," and arrive even in the best regulated breeding establishments, their owners only being too anxious to secure a customer for them at any price. For instance attend one of the leading shows, and ask the owner of a prize winner to place a price upon his animal, and naturally he will place a very stiff figure upon it, and rightly so, as good horses of any description command a higher price in England than anywhere else in the world. The intending purchaser on remarking that the price asked was higher than he wished to go, the owner in nine cases out of ten will respond with the following remark :—"Oh, I have a horse at my place at so and so, which will suit you exactly, and I can take such and such a price for him, he is own brother or half brother, etc., etc. to the one you see here, and very little below his standard." The unsuspecting customer pays the owner a visit, is well entertained, buys the horse, and leaves the late owner congratulating himself upon the easy manner in which he has been able to rid himself of a practically unsaleable animal so far as the English market is concerned.

A lesson should certainly be taken from other countries in the enormous improvement they have made in their horses, and they have accomplished this by buying

up all these old English breeds for close upon a century, until the French are able to boast that their cavalry is the best mounted in the world. The same action holds good in the case of all other European countries and America. Buyers from these countries could always be seen by the score attending all the large horse fairs and shows in the United Kingdom, buying up all the best mares and stallions they could lay their hands upon, with the result that at the present moment they are able to supply thousands of first-class horses to the London market of exactly similar type to those previously exported from the Old Country. At one time the exportation of mares was carried to such an extent that the country became almost denuded of good mares, farming became bad, and the breeding farmers had to sell their best mares to meet their losses, a thing which had never been previously contemplated, either by themselves or their forefathers.

I will now make a few remarks about the direct crossing of the three breeds advocated as being the most suitable sires to cross upon the native mares of this country.

The Hackney Thoroughbred Cross.

Some of the finest and most noted saddle-horses ever seen in the English show ring have been bred in this manner; this cross produces horses with action as light as a feather, with all the beautiful carriage and dash of the Hackney combined. No animal of any distinct breed can compete with this cross as a saddle or park-hack, neither can any other horse stand against him in the show ring. One of the most noted breed of horses in the world was produced in this manner, being a cross between the old English trotting horse (now the Hackney) and the thoroughbred. Both of these animals were originally exported from England, viz:—That greatest of all American sporting horses, the Trotter.

The Thoroughbred Coach Horse Cross.

Very fine hunters have been produced by mating Cleveland and Yorkshire bay mares with hunter sires. The writer distinctly remembers a horse which had been bred in this manner being sold for four hundred and fifty guineas at four years old, and this amount was paid for an animal that had never seen hounds. This horse I had personally known from the day he was foaled.

The Hackney Coach Horse Cross.

This was the manner in which the London carriage horse was bred before the advent of the different stud books. This animal was bred distinctly to type, with no particular regard to pedigree by mating in the above manner, and found a ready sale to the London dealers, but the coming into vogue of the Hackney and Coach-horse stud books, chiefly brought about by the action of Mr. Burdett Coutts, Sir Walter Gilby, and several other prominent gentlemen, completely put a stop to the production of this class of horse. Breeders all over the Kingdom took to the breeding of pedigree stock, whether for good or evil, so far as profit is concerned, remains to be seen. Certainly the class of animal mentioned found a ready sale at very remunerative prices at four years old, and invariably brought the breeders from one hundred pounds upwards.

At the sitting of the Royal Commission on horse-breeding in Ireland some four years ago, several old London dealers, well known to the writer, deplored their inability to secure the class of horse generally required for the London market, especially for carriage purposes, and which, they informed the Commissioners, they used to secure in large numbers twenty or thirty years ago in the Northern Countries. On being asked how these animals were bred not one of these men could give a correct answer, and the reason is not far to seek, as it was of minor importance to the dealers how the animals were bred, and not one in a hundred ever took the trouble to ask, they simply purchased the animal at his actual value, pedigree being of no consequence to them. Whatever may be the ultimate outcome, it is an undisputed fact that the production of this class of horse, like numerous other profitable industries, has fallen into the hands of the foreigner The answer as to how these animals were bred would have been readily given by old breeders who used to produce this class of animal, and I do not remember seeing the names of any of them as having given evidence before the Commission.

Suggestions.

And now a few words to anyone coming out to this country with an idea of going in for horse breeding, from one who has had some experience in this direction. Firstly, aim at breeding to a given standard. Secondly, do not go in for numbers; start by selecting a limited number of the best native mares procurable, handle every one of them and break them to the halter before commencing breeding operations. The reason I advocate this procedure is simply because a good animal is always worth taking care of, which is impossible in the case of a wild horse. Should any of them become sick, meet with accidents, or become impoverished during the winter, they can be taken in hand at once, whereas in the case of a wild animal practically nothing can be done. Then again, all youngsters should be haltered before they arrive at a year old, the younger the better, many of the breeders in England at the present moment halter their colts before they are two months old. Once this is done thoroughly, they never forget the lesson, and can be caught and attended to at any time. I venture to say that horse-breeding on the above lines will prove far more profitable, in the long run, than would be the case with any quantity of wild horses, as losses from accident, poverty, or disease would be reduced to a minimum.

All growing stock should be liberally fed in the winter to prevent them from becoming stunted. The feed should be as plain as possible, consisting chiefly of hay and roots (for preference turnips or carrots). Grain should only be allowed when absolutely necessary.

Referring to the question as to whether the enterprise of remount breeding should be undertaken by private individuals, or by the respective Governments, I am certain that it would be far better left in the hands of practical breeders, but on the other hand, taking into consideration the enormous expense incurred, and all the attendant risks thereon in securing suitable stallions for this purpose, I am of opinion that breeders should receive every encouragement from their particular Government in the way of offering large premiums to be competed for yearly, amounting at least to two hundred and fifty pounds sterling, administered on similar lines to those under which the Government premiums are competed for in the United Kingdom, Governments to fix stud fees and place where the animals must stand for the season. Liberal concessions should also be allowed by the Railway Departments in the case of breeding stock. In Great Britain, where the railways are run by private companies, brood stock can be sent anywhere over the different railway systems at half one single fare there, and are allowed the return journey free of charge any time within a period of four months.

Botanic Gardens, Durban.

UP-COUNTRY visitors to Durban—and now-a-days they are numerous—should make a point of seeing the Botanic Gardens of the seaport town before leaving for the high veld. The tram cars go the most of the distance, and rickshas are generally plying to convey visitors over this remnant—about half-a-mile—of the journey. From a picturesque point of view, the wealth and variety of colour, the graceful and, in some instances, peculiar contours of the trees and shrubs, the Gardens will well repay the pilgrim his small loss of time. If the visitor is in search of information regarding any of the plants inside the Gardens, or indeed of many which, from climatic and other reasons, are not within the collection, he may feel sure of getting what he requires from the enthusiastic botanist, the curator, Mr. J. Medley Wood. Not far from the entrance may be seen a small bed of paspalum dilatatum looking perfectly healthy, green, and succulent. This is planted out from the accidentally sown patch in Newcastle, and discovered by Mr. Wood during one of his botanising tours. The whole of the Newcastle patch

has now disappeared, a reader of what appeared in the *Journal* with respect to it having taken away all that could be found. At intervals we shall give descriptions of some of the trees and plants which would probably prove profitable if cultivated on a commercial scale.

CONSERVATORY, BOTANIC GARDENS, DURBAN.

THE ILLUSTRATIONS.

The larger illustration represents the Jubilee Palm House or Conservatory. The funds necessary, nearly £2,000, were contributed by the Durban community, and were collected by Mr. M. S. Evans, M.L.A., and Mr. T. W. Edmunds. The picture was taken on the occasion of His Excellency the late Governor, Sir Walter Hely-Hutchinson, declaring the building open to the public. The second illustration gives a glimpse of the inside of the building. Ferns, caladiums, etc., which find difficulty in growing outside, thrive luxuriantly in the moist, tropical warmth of the house.

INTERIOR, JUBILEE PALM HOUSE

Photo by Editor.

The Mapstone Oat.

THE Government Entomologist has been furnished with the following interim reports upon the Mapstone rust-resisting oat, from some of those to whom seed was supplied early in the year.

The reports are published for general information, and Mr. Fuller will be glad to receive reports from other farmers who have had this oat for trial. Farmers noticing rust in the oat are particularly requested to submit samples for examination, and, in furnishing reports, comparisons made between this oat and others will be most valuable and very acceptable.

"I have to report for your information that all the 'Mapstone Oats' planted here have gone off with rust."—(Walter Pepworth, Bolesworth, 29th April, 1901).

"They (the Mapstone Oats) showed up well, until a foot high, when signs of rust appeared, and, to save some hay, I cut them down. Otherwise they would have—I think—gone like the Algerian I put in, as in some parts of the small crop it was badly rusted."—(R. H. Pepworth, Zwaartkop Valley, 10th July, 1901).

"I planted the oats the third week in April; I planted them in a long strip

14 yards across, planting on each side Cape seed. I noticed yesterday that the Mapstone Oats looked healthier than the Cape alongside. I will report again, but do not expect the best result, as I do not think that they have had a fair chance."—(Geo. Martin, Ixopo, 16th July, 1901).

"*Re* Mapstone Oats. There is very little to report, except that the oats were sown on the 26th March, and so far have not shown any signs of rust."—(J. H. Duryarnd, Ixopo, 16th July, 1901).

"I received the oats a little too late for this district, they were planted at the end of January and grew away up to March. In March, when it was so wet, a little rust appeared, but died away when the dry weather set in; the piece of forage is now quite green and trying to head. It is about thirty inches high."—(H. Baker, Umlaas Road, 9th July, 1901).

"*Re* Mapstone Oats. They are just commencing to shoot, and are in as healthy a condition as I could wish. They have just been thoroughly irrigated and look beautiful."—(W. Oldfield, Fox Hill, 9th July, 1901).

"I planted the Mapstone Oats on February 8th; they are coming on well now. These oats are well called 'rust-resisting,' as they have grown almost entirely free from rust. By careful watching I only found one or two little specks the size of a pin's head. The field (8/10 acre) is looking beautifully green now and promises to be a *thorough success*."—(M. F. Phipson, Fox Hill, 8th July, 1901.

"Sorry to say the Mapstone Oats came to nothing; it grew to eighteen inches high and then died off, so I cut it, and I think it will come on in the spring. It looks very promising so far."—(H. Nadauld, Umlaas Road, 10th July, 1901).

"I have found the Mapstone Oat not only rust-resistant, but frost-proof, and from its heavy stooling habit I consider it an excellent substitute for the old winter oat now no longer growable."—(G. R. Richards, Mooi River, 8th July, 1901).

"*Re* Mapstone Seed Oats. I had 25lbs. which were planted on 3rd January on a little more than half an acre of ground. 1½ cwt. of superphosphate was put on the land and harrowed in at the same time as the seed. The crop was reaped on the 10th June. The seed should be planted here, in my opinion, in the first or second week in December, (our elevation being over 5,000 feet). About half the crop threw out seed-stems, but the seed is not mature and is light; some of it may germinate, but not all. The oat grew a good strong plant, perfectly free from rust, and some of the plants that threw out seed-stems would be nearly five feet high. I consider it a good forage plant; it had a good deal of frost on it before it was cut and was not affected by it at all; but stood perfectly green. It was cut as there was no chance of it ripening off this season, and the frost and drought might have injured it if left later."—(W. McFie, Highlands, 12th July, 1901).

"I am glad to be able to tell you that the forage from the Mapstone seed is doing fairly well. I planted about an acre with the seed. The land was partially manured with cattle-kraal manure. In the manured ground there is promise of a good crop, but where the ground is poor the stalk is short. I have irrigated the crop twice. There is no sign of rust so far as I can see."—(J. H. Holley, Broadmoor, 12th July, 1901).

"The seed was not a good quality and came up thin. In April the plants commenced to be blighted, in May they had a shower of rain and overstood the blight and have completely recovered. Their appearance is good, but they are suffering from drought at present. I shall decidedly recommend them to be planted. I may further state that I planted some Algerian oats on the same day; these took the blight in a more severe form, and about a fortnight sooner."—(E. C. Nuss, Krantzkop, 12th July, 1901).

"I received the oats in the beginning of March and planted them, manuring the land with phosphate. About three weeks after it came up, unfortunately, a hailstorm cut it all off. However, it started afresh, and grew well to about six inches in height, then the frost stopped further growth. I put a few sheep on the land to feed the oats down, and expect to reap a crop next December. There was no rust at all on the oats."—E. B. Parkinson, Lidgetton, 17th July, 1901).

"*Re* Mapstone Oats. They were planted in sandy soil, well manured with ordinary kraal manure. Result—green, very rank,

no rust, and are only just coming to seed."—(W. H. Westbrook, New Hanover, 5th August, 1901).

"Oats grew well for about two months, when they rusted slightly. They are now standing eighteen inches high, but no sign of seeding, and only very slightly touched with rust. I do not know if they will head when the rain comes, but I hope so. I think had they been sowed six weeks earlier they might have headed."—(F. Oellermann, New Hanover, 13th July, 1901).

"I planted the seed on the 13th January. Unhappily, a few days after, we got a severe thunderstorm, with very heavy rain, and the lot was washed away."— C. Schroeder, New Hanover, 24th August, 1901).

"*Re* Mapstone Seed Oats which I received for trial. I planted them 2nd February; they came up nicely but grew slowly. I waited, expecting them to come to ear to get the seed. They grew three feet high with no signs of the ear coming out. I have cut them for the cattle, and they are stooling up splendidly again. I hope to get a good crop of seed in summer. I think they are a summer oat and not for winter. I must say they are free from rust."—(G. C. Mackenzie, Buccleuch, 19th July, 1901).

"*Re* Mapstone Seed Oats. Have sown the oats in the beginning of February, 1901, on well prepared land. They came up well and looked nice until the drought came on, when they turned yellow and rusted slightly. The forage has been standing now nearly six months, and they show no sign of seed yet."—(R. H. Oellermann, Rudolph's Heim, New Hanover, 17th July, 1901).

"The Mapstone Oats are free from rust yet, but mine are very small and grow very slowly, as it is very dry."—(W. H. Bentley, New Hanover, 31st July, 1901).

"*Re* Mapstone Oat. They made good progress for a month, or there about, when they took the rust slightly. They were irrigated, and, after the frosty nights, recovered completely, and are now standing about two feet high and are beginning to shoot out."—(H. Herbert, New Hanover, 12th July, 1901).

"*Re* Mapstone Oats. I planted them in well prepared soil, manured with bone dust. The oats came up well, and looked very promising until about eighteen inches high, when I perceived symptoms of rust, which was checked by the first frost, and since then the forage made a poor attempt to seed, and is now completely drying off. I intend mowing it down so as to give it an opportunity of shooting in the spring. I do not think it is a winter oat."—(Jas. A. Westbrook, New Hanover, 19th July, 1901).

"*Re* Mapstone Seed Oats. On the 29th January I sowed the oats on well prepared land, being very well worked; but I am sorry to add that on the next day a tremendous storm came down and simply flooded and covered the seed with mud, and, of course, there was no chance of saving anything."—(H. D. Dinkelmann, Dalton, 16th July, 1901).

"*Re* Mapstone Seed Oats. They were sown on January 15th, and came up very well. The crop was looking well until the beginning of April, when it became quite yellow, but on examination I found it was not the rust we have on other forage. The forage turned a little green again after I irrigated it. It has been standing now exactly six months, and there is no sign of its getting into seed yet, and its height is only about eighteen inches. But I think the oats sown in spring would turn out better."—(E. C. F. Oellermann, Dalton, 15th July, 1901).

The first trial of the oat was made by Mr. C. B. Lloyd, late Commissioner of Agriculture, who furnishes the following interesting note:—"Mr. Mapstone gave me an envelope full of seed the day you and I went to see his crop. This seed I planted carefully in rows on June 13th, 1900 (at Highlands). Owing to the dry weather I had it irrigated twice during July and August, and three times during September, October, and November. It grew very well and strongly, each plant stooling out nicely. As soon as it came into head I had it covered with fruit-fly netting to keep off the birds. On November 20th rust appeared, but very slightly—the crop being then just ripening. On December 3rd the crop was dead ripe and very rusty, and was cut. Had I desired the crop for forage I should have secured it early in November without a speck of rust, as it was only when

it began to turn yellow that rust appeared. I obtained two-thirds of a bucketful of good clean seed from the plot. Half of this seed I planted again on June 13th this year, and it has grown splendidly. The other half I intend to plant in January next."—(C. B. Lloyd, Hidcote, Highlands, 7th August, 1901).

Garden Notes for August.

By W. J. Bell, Florist and Seedsman.

FULL crops of potatoes should now be planted in the midland districts where frosts are generally over by the middle of the month.

Further sowings of peas may be made for succession. Also lettuce, radish, turnip, carrot, cabbage, beet, onion.

As soon as danger from frost is over, sow cucumber, marrow, squash, tomato, sweet and water melons, egg plant, and capsicum.

Young plants for planting out may be had much earlier by sowing at once in boxes in a framework with a little bottom heat from a hot bed.

Rhubarb roots should now be planted in deep rich soil with a south aspect if possible, and thoroughly protected from the hot winds.

Planting of deciduous fruit trees should be completed this month, such as apples, pears, peaches, plums, apricots, nectarines, also grape vines. Evergreen fruit trees, such as loquots, oranges, lemons, guavas, &c., should not be planted till the rains have set in.

Deciduous fruit trees may now be grafted, and pruning should be completed as early as possible.

Cuttings for fences may now be put in, such as mulberry, quince, hibiscus, spirea (White May).

Graftings should be commenced as soon as the eyes or buds begin to swell. Select the grafts from the preceding year's growth, and cut about 5 or 6 inches in length, and about the thickness of an ordinary lead pencil.

The cuttings should be as firm and strong as possible, so that they are not too large for the stocks, for although weak cuttings will grow they will not do so well as the stronger ones, neither will they bear so well the dry, hot winds prevalent at this season.

Prepare the stock by cutting the stem close to the roots, after removing some of the surface soil, so that the graft may be inserted as near to the root as possible.

There are various ways of grafting, but the best and usual method is what is commonly called whip grafting.

Hold the scion or graft in the left hand, and take a slice off the end about an inch long, and be careful not to let the knife cut too deep to get into the pith till it gets near the end of the slice; having made the slice in the manner described, cut a tongue or slit which should be about a $\frac{1}{4}$ inch long, commencing about a $\frac{1}{4}$ inch below the top of the slice.

Having got the scion ready, take a slice off the stock the same length as the slice in the scion, make a tongue, or slit, about the same length as that on the scion, beginning nearly at the top of the slice, letting the knife slope gradually into the stock. Then insert the tongue of the scion into the tongue of the stock, and tie together with bast, taking care that the inner rind of the graft and stock fit together on one side, and also at the bottom, if possible, as the grafts derive more nourishment from the bottom than the sides. After tying carefully, so as not to misplace the scion, cover with clay, and draw the soil round, so as to exclude sun and air as much as possible. The clay should be prepared by being well worked, so as to free it from lumps and stones, and should have about a third cow-dung mixed with it.

Flower Garden.—Hardy flower seeds may still be sown as recommended in previous notes, and as soon as danger from frost is over, sow half-hardy and tender annuals and perennials, such as aster, aceroclinium, calandrinia, canna, Centaurea-Americana, cobrea scandens, cockscomb, dahlia, globe amaranthus, helichrysum, heliotrope, ipomœa, marigold, sensitive plant, nasturtium, portulaca, zinnia. Plant summer flowering bulbs, such as liliums, gladiolus, tuberose, pancrateums, amaryllis, etc.

Malton Farmers' Association.

PRESIDENT'S ANNUAL ADDRESS.

At the annual meeting of the Malton Farmers' Association on 31st July, at Settle, the Chairman (Mr. W. Baynes) said :—During the past year three general meetings have been held, and three new members elected. The deputation appointed in October to urge on the Prime Minister the appointment of a Station-master at Otto's Bluff was courteously received and led to entertain the hope that the request would be complied with during the early part of this year. If nothing has been done yet in the matter we may be sure that valid reasons can be alleged; but I understand that the necessary building will shortly be commenced.

The negotiations for importing bone meal having, unfortunately, fallen through, we shall have to be content with basic slag, or such other commercial fertilisers as suit each man's fancy, soil, or pocket.

Rust and blight continue to afflict our forage crops, and no satisfactory remedy or substitute is yet forthcoming. Millet (or manna) will probably be more grown. Some was shown at New Hanover last week, of very fair growth, but it, too, seemed to have suffered from rust. Those who have good deep soil should give lucerne a trial. To convert it into hay of a marketable quality, a mowing and a baling machine would be required, and these are coming into more general use; for haymaking, generally, has become a great industry, and vast areas are now annually shorn of their natural grasses. How long they will submit to it without manure is a question that time only can answer.

I have again to record a dry spring—the driest in my experience. To get any crops in at all demanded energy and organisation of on mean order. Eleven days was all I had. Until March no rain of any consequence fell here since March of last year. Again, the higher lands have had the advantage. Except, perhaps, in a few favoured places, the mealie crop will be below the average. At present prices it will not be a very remunerative one, when we take into account the cost of fertilisers, kafir labour, and trek oxen, and the fact that mealies, being now the only crop that it is safe to grow, must pay the whole rent of the farm. It is very unsatisfactory, too, that, with a few weeks only, at high pressure, for ploughing and weeding, there should be such an unconscionably long time to spare for reaping. The ploughing season, being so short, necessitates a large number of oxen being available, and then, for eight or nine months, on most farms in this district, there is absolutely nothing for them to do. In former times they would have gone on the roads, "leading transport." That is now a thing of the past. But, as usually happens, something else turns up, and it seems likely that employment will hereafter be found, at least during the autumn, in ploughing for wattles. Just now the farmer is most fortunate who has a wattle plantation of his own to fall back upon, when he runs short of ready money, or employment for his hands.

Two meetings of the Natal Farmers' Conference have been held, at which this association was represented. Your delegates failed to carry the resolution urging the slaughter of lungsick beasts, too many people being still of opinion that a beast is all the better, and in fact, more valuable, for having undergone a course of pleuro-pneumonia. Such a beast, it is true, may be fairly considered immune, and incapable of again contracting the disease from another; but, should he ever get a touch of fever or inflammation, and his lung be then recrudescent, I am still confident that he would be a very lively source of contagion. However, as such animals are being disseminated, as it were, all over the colony, careful observations should soon settle this vexed question one way or the other.

A resolution passed by the Conference in favour of the immediate establishment of experimental farms, has been already given effect to by Government, and a sum of money voted by Parliament for the purpose. I know some people deprecate such things as a useless waste of money—like offering pearls to swine. I trust, however, some of us are animated by a more teachable and progressive spirit. In all ages, since Adam took to farming, and in all countries (from China to Peru) that have attained to any degree of civilisation, agriculture has been the special and constant care of Princes and rulers. Its encouragement and protection have been recognised as necessary not only to the comfort and wealth, but the very existence of a great nation. In our own times the farmers of America, Australia, and many other countries, have had experimental farms, agricultural colleges, professors and experts, lavished upon them. Their enlightened and far-seeing rulers take care that every aid and encouragement possible shall be held out to those who are willing to develop the resources of the soil. In the United States, especially, nearly every item of extensive agricultural production has long been protected from foreign competition by an adequate impost on all such articles as would otherwise enter into a successful rivalry with them from abroad. Is it not a fact full of significance for us that these are the very countries that are now successfully competing with us in supplying South Africa with almost everything we consume? Therefore, it behoves us, I say, as farmers, to show our appreciation of such favours as we are receiving from the Government, by utilising them to the utmost for our own and the colony's benefit—and then to ask for more.

As a beginning, I would suggest that we each give our worthy and obliging Hon. Secretary

an order for the "Agricultural Journal." It would save us, individually, some trouble, and he would most likely get a liberal discount, which (if he did not pocket it as a richly-deserved perquisite) would help to swell our modest funds. The puff I am hereby giving the "Journal" should in itself secure generous terms from the publishers, and possibly other associations may take the hint and adopt the same method. I certainly think it is the duty and interest of every farmer to subscribe to it, for the circulation and the merit of such publications very much depend the one on the other. If it is not all we would wish, who is to blame? It is our very own, and in our power to make it, or have it made, anything we like, so that every man, woman, and child in the land may find something in it to amuse or profit by.

Something beyond mealie growing will soon have to be found, to keep the boys and girls on the farm. Country homes must be brightened, and a deeper and more intelligent interest fostered in all open-air pursuits. Some of you can well afford to send your boys for a year or two to one of the Australian colleges. In every age a youth's occupation has been considered incomplete until he had seen something of the world, and acquired self-reliance and broader views, besides many other accomplishments that only travel can confer

But if it be true that "the hand that rocks the cradle rules the world," surely the mental and physical education of the girls is of even more importance than that of the boys, and one cannot but observe with satisfaction the immense advances that have lately been made in this direction. When we consider that at least ten or twelve of the earliest and most plastic years in the lives of the next generation will be in their hands to guide, control, and oftimes to educate, it augurs well, I think, for the future of the great Anglo-Saxon race, all over the world, that its young women are now being taught that a nobler career is open to them, and a higher level attainable; and that, in short, more is required of them now-a-days than that they should merely look pretty for a few years, and then be content, poor dears, for the rest of their humble lives, "to suckle fools and chronicle small beer."

Most of us have now got our wagons and oxen back from the military, or their equivalent in cash—for, as far as I know, claims for compensation have been honourably settled. The Wagon-Owners' Association, for which there was no longer any need, died a natural and not altogether inglorious death, leaving enough to defray funeral expenses, and a few pounds as a legacy to an orphanage. Experiences vary, and probably those who have done the best with their wagons say the least about it. I hear of at least one man who has been employed over eighteen months, and not lost a single ox. That some good money has found its way into this, as into other districts, is very evident from the high prices at which farms have lately been changing hands. It is no less evident that money is being carefully husbanded, as well as wisely expended, for, while an increase of comfort and refinement is here and there noticeable, a severe check is being kept on luxury and extravagance. But perhaps the most gratifying feature is that, so far as I am aware,

No one drinks who did not drink before,
And those that used to drink don't drink the more.

In regard to a possible collapse of the present inflation, when the war is over, I don't think we have much to fear. The conditions are very different now to those of twenty years ago. After a long period of British apathy and indifference, culminating in the surrender of the Transvaal, capital simply turned its back and left us to gasp and stew in our juice. Truly, in those days, when we come to think of it, our resources were absurdly few, and insignificant; whereas to-day, with resources practically inexhaustible, and the Mother Country sternly determined to make amends for past neglect, there can be little doubt that when the war is over and settled, South Africa will be absolutely flooded wtih capital and enterprise.

Many persons think this war is being greatly prolonged by undue leniency. Such persons should remember that Britain professes to be the foremost of the great nations of Christendom. Nearly two thousand years have elapsed since Christ trod this earth and preached certain doctrines, and it can surely not be considered too soon for British statesmen to venture on putting those doctrines to a practical test. However undeserved and ill-requited, however mistaken and inexpedient such leniency may appear to some, there is this at least to be said, that a great lesson is being taught to all nations, a most important and far-reaching principle established, and the sublime truths of Christian charity, mercy, and forbearance, exemplified as they never have been before. Twenty more centuries may or may not pass away before men learn to adjust their differences without war, but a distinct step has been taken in that direction, and in the amelioration of mankind, and for all time the horrors and atrocities of former days have henceforth ceased to be even tolerated.

Writing to Mr. P. R. Gordon, Mr. William Duthie, of Collynie, the now celebrated breeder of Scotch Shorthorns, states that the prices for that class of stock are too good at present, and cannot continue at the present high level. He thinks it is not beneficial to the breed that they should do so. Good animals are worth good prices, but extravagant rates bring into business speculators who have neither knowledge nor love for the cattle. Again, high prices for certain families induce breeders to breed with inferior animals, if only they have the popular pedigree.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inandwa & Ndwedwe	Lungsickness	Grichie ...	Newlands.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	W. Ralfe ..	Ennersdale.
		,,	F. R. Moor ...	Greystone.
		,,	Cooke & Co. ...	Blue Krantz.
		,,	F. Bloy ...	Monte Christo
		,,	— Maritz ...	Springbank.
		,,	Jas. Ralfe ...	Frere.
		,,	F. Knapp ...	Klipfontein.
		,,	G. M. Rudolph ...	Spitzburg.
		,,	J. W. Moor ...	Moorleigh.
		,,	E. A. Drier ...	Vaarkinsfontein.
		,,	Nqatabaan ...	Moord Spruit.
J. Button ...	Estcourt, South of Bushman's River	,,	S. Nel ...	Wagon Drift.
		,,	D. Mackay ...	Dalton.
		,,	R. Mattison ...	Fernhurst.
		,,	C. C. Randles ...	Glen Lyndon.
		,,	C. Cope	The Hoek.
		,,	J. Mattison ...	Klip Stone-
		,,	C. B. Lloyd ...	Hidcote.
		,,	Mrs Lindsay ...	Rosebank.
A. H. Ball ...	Weenen ...	,,	T. J. Van Rooyen	Belle Vue.
		,,	C. Van Rooyen & J. S. Els	Scottsberg.
		,,	W. Lotter ...	Doornkloof.
		,,	P Van Rooyen ...	Middleburg.
J J. Hodson ...	Lion's River ...	Lungsickness	Mgina... ...	Location
		Scab	Jas. Morton ...	Tweedie Hall.
		,,	A S. Parkinson ...	Shafton Grange.
		,,	A. C. Thomson ...	Fort Nottingham.
		,,	W. Taylor ...	Fordoun.
		,,	W. T. Shaw ...	Shawswood.
		,,	W. Pepworth ...	Bolesworth.
		,,	Mrs F. McKenzie	Onverwacht.
		,,	W. L. Methley ...	Newstead.
		,,	S. Nurden ...	Wood Farm.
E. J. B. Hosking ...	Upper Umkomanzi	,,	F. Curry ...	Weltevreden.
		,,	H. Nicholson ...	Alton.
		,,	W. Nicholson ...	Beaulieu.
		,,	H. Hosking ...	Trewirgie.
R. J. Raw ...	Impendhle ...	,,	F. Nicholson ...	Alton.
		,,	R. Ogram ...	Tillstudleni.
		,,	— Roberts ...	Ebrington.
		,,	C. P. Spiers ...	Mount Park.
		,,	Sobuqu, Verta & Pinda	Natal Land & Colonisation Co's farms.
		,,	Nozulela ...	Nooitgedacht.
		,,	T. Fleming ...	Good Hope.
		Lungsickness	Donga ...	Johnstone.
		,,	C. C. Lewis, and Native ...	Clairmont.
W. Wilson ...	Polela	,,	Miller, Bros. ...	Fairacres
		Scab	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
		,,	R. Nicholson ...	Lowlands.
		,,	R. C. Gold ...	Woodend.
C. E. Hancock ...	Ixopo ...	Lungsickness	W. W. Walton & Natives	Dronk Vlei.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
C. E. Hancock ...	Ixopo ...	Scab	R. Kennedy ...	Cornhill.
		"	A. Watson ...	Rosehill.
		"	W. Gray ...	Helmsley.
		"	Natives ...	Langefontein.
		"	E. H. Surridge ...	Chadwell.
		"	Rulumeni ...	Farm adjoining Chadwell.
		"	J. Dalgarno ...	Abercairney.
		"	A. Stone	Craigie Lee.
		"	W. W. Walton ...	Dronk Vlei.
J. F. Bernard ..	Newcastle	Lungsickness	A. A. Osborn ...	The Mount.
		"	J. F. Grant ...	Hilldrop.
		"	J. Mortimer ...	Try Again.
		"	P. W. Dept. ...	Newcastle T'Lands
		"	C. Watson ...	River Bend.
		"	G. E. Jubber ...	Brackfontein.
		"	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		"	J. W. Goodwill ...	Cornwall.
		"	A. Paine ...	Mount Prospect
		"	Natives ...	Droog Plaats.
		"	G. W. Nourse ...	Ruth.
		"	Simeon Ndhlovu	Freda.
		"	S. W. Reynolds ...	Newcastle T'Lands.
		"	O. Olver ...	"
		"	G. W. White .	Ruth.
		"	C. R. Savory ...	Pomeroy and Evin.
		"	Blizzard & Pratt	Ingogo.
		"	J. W A. Welsh ...	Paradise.
		"	G. Wood ...	Heron's Court.
		"	W. L. Jee ...	Lennoxton.
		"	A. F. Henderson...	Brazil.
		"	A. J. Crawford and Natives ...	Diamond.
		"	Natives ...	Milton.
		"	Lowrens and Van der Merwe ...	Buffalo River.
		"	H. Fick ...	Northdown.
		"	H. Austin ...	Wykom.
		"	T. L. Möller ...	River Bend.
		"	Natives ...	Elizabeth Dale.
		"	J. Masangu ...	Pernambuco.
		"	Funwayo ...	Tiger Kloof.
		"	G. W. Nourse ...	Blauwboshlaagti.
		"	G. W. Nourse ...	Glen Harte & De Wetstroom.
		"	W. Steele ...	Tweefontein.
		"	— James ...	Newcastle.
		"	A. S. Carbairns ...	Mooi Plaats.
		"	Umketega ...	Vrede.
		"	Bonombi ...	Heron's Court.
		"	F. Stevens ...	Newcastle.
		"	A. J. Hurd ...	Tweefontein.
		"	G. J. Way (Derelict Stock) ...	Vrede.
		"	Mtshabane ...	Reserve.
		"	Mahakan ...	Kilbarchan.
		"	Johannes ...	The Reserve.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	Umbetta ...	Freda.
		,,	R. Morrison	Newcastle.
		,,	Maling & Sibibi...	Blauwboshlaagte.
		,,	Umgubana & Mahlogozulu ...	Hope Farm.
		,,	S. W. Reynolds ...	Ramsgate.
		,,	Mangweni ..	Hope.
		,,	W. Uquhart ...	Laureston.
		,,	Jack Unguni ...	Blauboshlaagti.
		,,	Umpegelele ..	Kilbarcean.
		,,	A. J. Crawford ...	Newcastle.
		,,	W. Adendorff ...	Sanford.
		,,	S. W. Reynolds ...	Minster.
		,,	Umgodini & Kumalo	Greenwich.
		,,	H. Meineke ...	Ruston.
		,,	Umbobojan ...	Valsefontein.
		,,	Mrs. H. C. Shorter and Sambana ...	Spectacle Spruit.
		,,	J. T. Grant ...	Rooi Pont.
		,,	C. Jackson ...	Yarl.
		,,	H. C. Dicks ...	Minster.
		,,	T. Ferrier ...	Henley.
		,,	Sekonyana ...	Rooi Poort.
		Scab	G. J. Way ...	Vrede.
		,,	G. Star ...	Lennoxton.
		,,	R. S. Miller ...	Goloch.
		,,	C. G. Palmer ...	Dry Cut.
		,,	J. Davidson ...	Lennoxton.
		,,	A. J. Debenham...	Knowsley.
			G. Wood ...	Heron's Court.
		,,	A. D. Uys ...	Horn River and Mooi Krantz.
		,,	T. Ferrier ...	Henley.
		,,	G. Jackson ...	Try Again.
		,,	W. Richards ...	Tweefontein.
		,,	W. E. Few ...	Erin & Imbezana.
		,,	Blizzard ...	Ingogo.
		,,	W. Short ...	Potter's Hill.
		,,	J. Matthews ...	Shakespeare.
		,,	G. Brown ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	R. S. Armitage ...	Boschhoek.
		,,	H. P. Beare ...	Harte River.
		,,	— Wood ...	,,
		,,	Jim Smith ..	Lennoxton.
		,,	S. W. Reynolds ...	Minster & Ramsgate
		,,	N. H. Fick ...	Wykom.
		,,	A. Vanderplank ...	Eagle's Cliff.
		,,	W. Nicholson ...	Rooi Poort.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	Anea & Latcham	Plessis Laager.
		,,	W. Oldfield ...	Ambleton.
		,,	Jonas ...	Slangspruit.
		Scab	Dickinson Bros....	Braeburn.
		,,	Ulukozana ...	Bishopstowe.
J. Chaplin ...	Klip River	Lungsickness	Discharged Transport Cattle	Matowan's Kop.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Lungsickness	A. H. Spring ...	Reserve.
		,,	A. Armstrong ...	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ...	Grobblar's Kloof.
		,,	Natives ...	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,,	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	Pepworth & Reid	Reitfontein
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein
		,,	J. Van Whye ...	Ladysmith T'Lands
		,,	G. J. Heslop ...	,,
		,,	H. E. K. Anderson	Gedula.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	G. F. & J. Wood-house	Davel's Hoek.
		,,	Natives ...	Georgina.
		,,	G. J. McDuling ...	Waterford.
		,,	Natives ...	Langverwacht.
		,,	,,	Vertrek.
		,,	Nondo Gama ...	F. J. Dewaals' farm
		,,	A. Boers, & Native	Marais Vel.
		,,	W. Neizel, & Natives	Roosboom.
		,,	Natives ...	Doornkraal.
		,,	E. Walker ...	Doornkloof.
		,,	J. Umpbleby ...	Springfield.
		,,	F. N. Nel ...	Catherine.
		,,	Natives ...	Macpherson'a farm.
		,,	P. Ruiter ...	Ladysmith.
		,,	Mdhlondhlo ...	Blaaubank.
		,,	Jobisa ...	Lombard's Kop.
		,,	Nosubala ...	Weltervreden.
		,,	H. E. K. Anderson and others ...	Dewdrop.
		,,	Nondabola ...	Zwaart Kop & Dew Drop.
		,,	— Sandals ...	Home Farm.
		,,	B. G. Zietsman ...	Bosberg.
		,,	Natives ...	Roodepoort.
		,,	W. Cochrane ...	S. Wiltshire's farm.
		,,	J. de Jongh & Natives ...	Potini Spruit.
		,,	Natives ...	Reit Kuil.
		,,	A. S. McHattie ...	Wessel's Nek.
		,,	Cory & Long ...	Ladysmith T'Lands
		,,	Henderson ...	Weltervreden & Paarde Vort.
		,,	Scomber ...	Kleinfontein.
		,,	G. Robinson ...	Little Magara.
		,,	Natives ...	Dreifontein.
		,,	J. Farquhar ...	Stuart's Park.
		,,	Malela ...	Reit Kuil.
		,,	P. W. Dept. ...	L. Smith Tn. Lds.
		,,	Myanga Tigalala...	Umhlumayo.
		,,	A. Henderson ...	Nelthorpe.
		,,	J. H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Scab	P. Nicholson ...	Walker's Hoek.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	E. F. Gibbons ...	Plaat Berg.
		,,	G. Wetherill ...	Walker's Hoek.
		,,	A. Krogman ...	Brakfontein.
		,,	M. W. Krogman...	Dreifontein.
		,,	P. Ma ais ...	,,
		,,	H. Boers ...	Dew Drop.
		,,	G. Spearman ...	Feir View.
		,,	J. Van Reenen ...	Wessel's Nek.
		,,	A. Boers ...	Mara s Vel.
		,,	A. arbutt & J. Good	Mat waan's Hoek.
		,,	Sparks Bros. ...	Ladysmith.
		,,	J. de Waal ...	Blaubank
		,,	F J. de-Waal	Lombard's Kop.
		,,	G. I nes ...	Eland's Laagte.
		,,	J. Umpleby ...	Springfield.
		,,	A. J. Taylor ...	Arnot Hill.
		,,	R. Horsley ...	Warrock.
		,,	Dr. Helps ...	Roosboom.
		,,	Corrigel ...	Koolfontein.
		,,	Co krane & Illing	Dansekraal.
		,,	H. S. Bowers ...	Zaaifontein.
		,,	A. Henderson ...	,,
		,,	A. Hen erson ...	Eenvogle Vlei & Elandslaagte.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	H. F. Pearson ...	Everton.
		,,	W. Caldwell ...	Stamford Hill.
		,,	Natives ...	Unini Location.
W. Freer ...	Upper Tugela ...	,,	Borbasee ...	Vrom Draai.
		,,	S. Sharratt ...	Klein Waterfall.
		,,	Natives ...	Green Point.
		,,	A. H. Coventry ...	Earthcote.
		,,	Mdhlenjana ...	Mooi Hoek.
		,,	P.W. Dept. ...	Acton Homes.
G. Gielink and F. W. White ...	Portion of Zulu-land ...	,,	Dinizulu ...	Hlabisa District.
		,,	Natives' Cattle ...	Melmoth.
		,,	Sebambindoda and Natives ...	Kwamagwaza.
		,,	Military Loot Cattle	Warbeck, Elizabeth and Barneveld Melmoth.
		,,	Damusa ...	near Melmoth.
		,,	Surrendered Boers	Hlabisa.
		,,	F. W. White ...	Melmoth.
		,,	G. Muller ...	Near Melmoth.
		,,	C. Green	Inyoni.
		,,	Liversage & Van Rooyen ...	Umhlatuzi.
		,,	Surrendered Boers	Eshowe.
		,,	Surrendered Boers	Port Durnford.
		,,	H. T. James ...	Prospect.
		,,	M. Van Rooyen ...	Mahlabatini.
		,,	Res. Magistrate ...	Mahlabatini.
		,,	Sgt. Evans, N.P....	,,

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
G. J. Gielink and F. W. White	Portion of Zululand	Lungsickness	P.W. Dept. ...	Eshowe.
		,,	F. A. Ortlepp ...	Saxony.
		,,	Military Cattle ...	Eshowe.
		,,	B. Green ...	Inyoni, Umlalazi
		,,	W. Magee ...	Mlalezi, Eshowe.
		,,	Arnold & Rorck...	Mlalezi, Eshowe.
		,,	— Corbett ...	Eshowe.
		,,	E. Loffer & Natives	Mahlabatini.
		,,	J. A. F. Ortlepp ...	Vlakbult.
		,,	J. R. White ...	Elizabeth.
		,,	F. W. Coop ...	,,
		,,	J. Henwood ...	Inyoni, Umlalazi.
		,,	F. Green ...	Umlalazi.
		Scab.	Surrendered Boers	J. R. Ortlepp's farm
		,,	W Pretorius ...	Warnbeck.
J. R. Cooper ...	Nqutu & Nkandhla Districts, Zululand	Lungsickness	A. Barklie ...	Nqutu Hill, Nqutu District.
		,,	Piet Gobese ...	Mangongoloza Hill, ,
		,,	Natives ...	Mkonjana,
		,,	,,	Telezi Hill, ,,
		,,	,,	Nqutu Hill, ,,
		,,	,,	Macebo Hill, ,,
		,,	,,	On Buffalo River, ,,
		,,	C. Johnstone ..	St. Augustines, ,,
		,,	Natives .	,, ,,
		,,	,,	Rorke's Drift, ,,
		,,	E. P. Vant ...	Vant's Drift, ,,
		,,	Natives ..	,, ,,
		,,	,, ...	Segweni, ,,
		,,	Umasesa ...	Hlati Spruit, ,,
		,,	Natives	Mangeni, ,,
		,,	H. Fry ...	Mpandhleni, Nkandhla District.
		,,	P. Zietsman ...	Near Umhlatuzi, ,,
		,,	Natives ...	,, ,,
		,,	Hutchinson and Hyslop	Near Magistracy, ,,
		,,	Struben, Bottomley & Loxton	Upper Umfongosi, ,,
		,,	,,	Middle ,, ,,
		,,	,,	Lower ,, ,,
		,,	,,	Qudeni Hill, ,,
		,,	J. Vanderwesthuisen	Near Inzuzi, ,,
		,,	H. Swanfield ...	Qudeni, ,,
		,,	Schonyana ...	Babanangu ,,
		,,	J. R. Nel & Van Rooyen	Ndule's Location, ,,
A. Klingenberg ...	Umsinga ...	,,	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
		,,	Mrs. H. Strydom...	Uithoek.
		,,	Ngobazane ...	Vermaaks Kraal
		,,	Usiquantjee ...	Emsita.
		,,	A. Müller ...	Pression and Buffalo Home.
		,,	M. Shebele ...	Freiburg.
		,,	Dr. J. Dalzell ...	Gordon Memorial M.S.
		,,	H Stegen & Natives	Craigneathen.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. Klingenberg ...	Umsinga ...	Lungsickness	H. Dedekind ...	Buffalo Home.
		,,	T. Keyter	
		,,	T. Crooks	Pomeroy Town Lands.
		,,	Botha	
		,,	Westbrook Bros.	
		,,	N. Smit ...	Tug la Ferry
		,,	J. Benecke ...	Stone Hill.
		,,	Nqala ...	Location.
		,,	C. P. K. Vrey ...	Kalkfontein.
		,,	Ungangaza ...	Pression.
		,,	E. V. L. DuBois ...	Vergelugen.
A. J. Marshall ..	Dundee ...	,,	Marshall Bros. ...	Cleveland.
		,,	J. Landman ...	Boschfontein.
		,,	Natives ...	Renier.
		,,	A. Jansen ...	Sheepridge.
		,,	Natives ...	Navigation Colliery.
		,,	F. Payne ...	Glencoe.
		,,	N Glutz ...	Swiss Valley.
		,,	J. W. Dupreez ...	Jackals ontein.
		,,	C. F. Van Rooyen	Davelsberg.
		,,	Lyle & Sangster...	Dundee.
		,,	Charley ...	Woodlands.
		,,	Umzagaza ...	Morgenstont.
		,,	H. J. Harris ...	Sterkstroom.
		,,	D Neumann .	Waterfall.
		,,	Natives ...	Weltervreda.
		,,	Paper ...	Smithfield.
		,,	S. N. Robins ...	Dundee.
		,,	N. Glutz ...	Morgenstont.
		,,	Natives ...	Maybole
		,,	Umonto ...	Crown Lands, near Dundee.
		,,	J. F. Johnson ...	Dewaar's Nek.
		Scab	A. Jansen ...	Sheepridge.
		,,	J. H. Erkland ...	Carolina.
		,,	F. J. deWaal ..	,,
		,,	J. H. Reis ...	Longfontein.
		,,	J. W. Dupreez ...	Jackalsfontein.
		,,	D. Opperman ...	Gedull No. 2.
		,,	M. J. Herbert ...	Vermaak's Kraal.
		,,	H. J. Hearn ...	Hatting Spruit.
		,,	Gouws Bros. ...	Kelvin & Kilburne.
		,,	N. Glutz ...	Swiss Valley.
		,,	C. F. Van Rooyen	Davelsberg.
		,,	Maritz & Thornhill	Aletta.
		,,	W. V. Marshall ...	East Lynne.
		,,	P. J. Gouws ...	Uitflucht.
		,,	H. Harris ...	Sterkstroom.
		,,	Murray & Co. ...	Navigation Collieries
		,,	J. J. Uys ...	Verdenk.
		,,	P. H. Swart ...	Hartebeestefontein.
		,,	H. J. Nel ...	Blinkwater & Evansdale.
		,,	A. G. Vincent ...	Craigieburn.
		,,	D. Neumann ..	Waterfall.
		,,	Turnbull & Co. ...	Washbank.
		,,	Peerbhoy ...	Dundee.
		,,	H. J. Hearn ...	Double Kraal.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK – (*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ...	Dundee ...	Scab	Thos Dewaar ...	Navigation.
		,,	A. B. Daniel ...	Beith.
		,,	H. Kriel ...	,,
		,,	F. Kolbe ...	Langfontein & Staat.
		,,	G. Colbe ...	Zwaartwater & Rest.
		,,	R. J. Marshall ...	Cleveland.
		,,	G. F. Ferreira ...	Hyle.
W. A. Hutchinson	Alfred ...	,,	W. Stafford ...	Sutherland.
		,,	Nqubu ...	Location.
		,,	Ngihla ...	St. Mary's.
		,,	Makubana ...	Amaci Location.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	Natives ...	Hungerspoort.
		,	A. P. Vandermerwe	Poortje.
		Scab	A. J. Harding ...	Zwart Kop.
		,,	J. Dryer ...	Culfergie.
E. Varty	Umvoti—Western Portion	,,	J. M. & J. C. Van Rooyen ...	Pampoennek,
		,,	A. M. Hofmeyer...	Emandhlim.
		,,	G. Z Van Rooyen	Daas Klip
G. N. Perfect ...	Umvoti—Eastern Portion	,,	Thos. Hill ...	Stolzenvels.
		Rinderpest	Natives Cattle ...	Sobuza's Location.
F. E. Van Rooyen...	Kranzkop ...	Scab	L. J. Potgieter ...	Broedershoek.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	— Thompson ...	Marburg.

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand have been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
14th August 1901.

M. J. HIME,
for P. V. Surgeon.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc: 37, 1900. For the month of June, 1901.

Date.	Description.	Quantity.	Imported from.	Ship.	Remarks.
1901.					
June 7	Apples & Pears	1,090 Cases	Adelaide	Blackheath	Free of Pest.
,, 8	Potatoes	27 Bags	Melbourne	,,	,, ,,
,, ,,	Apples	870 Cases	Adelaide	,,	,, ,,
,, 10	Grapes	115 ,,	,,	,,	,, ,,
,, ,,	Apples	171 ,,	,,	,,	,, ,,
,, 18	Potatoes	4,395 ,,	Melbourne	Sophocles	,, ,,
,, ,,	Apples	469 ,,	,,	,,	,, ,,
,, 20	Rhubarb Plants ...	1 ,,	,,	,,	,, ,,
,, ,,	Fruit Trees	3 ,,	,,	,,	,, ,,
,, ,,	Ornamental Plants	1 ,,	London	Inanda	,, ,,
,, ,,	Ornamental Plants	1 ,,	,,	Vladimir Sawin	,, ,,
,, ,,	Apples	200 ,,	Port Jackson	Norfolk	,, ,,

C. B. JONES, Examining Officer, Durban.

Custom House, Durban, 2nd July, 1901.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of July, 1901

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1900.	Total for same per'd from July 1st, 1899.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	73·1	52·0	82·6	46·2	0·02	3	0·02	23rd	0·02	1·62
Stanger	77·0	49·7	94·0	46·0	0·21	3	0·21	22nd	0·21	1·82
Verulam	74·8	48·5	82·0	43·0	0·00	3	...	...	0·00	1·41
Newcastle	70·1	35·5	79·0	32·0	...	...	...	...	...	...
Estcourt	69·3	30·0	80·0	25·0	0·00	1	0·00	18th	0·00	1·00
Port Shepstone .	71·2	62·0	78·0	55·0	0·43	4	0·23	29th	0·43	1·32
Umzinto	7·3	49·3	81·0	47·0	0·12	2	0·07	22nd	0·12	0·75
Richmond	71·5	41·3	85·0	35·5	...		...	...	...	0·65
Maritzburg	74·3	38·8	88·0	33·0	...	..	...	...	...	0·49
Dundee	72·4	30·6	76·0	22·0	...	.	...	...	...	0·36
Weenen	73·9	28·1	82·0	22·0	0·00	1	0·00	18.h	0·00	...
New Hanover	70·4	37·7	83·0	30·0	0·04	1	0·04	16th	0·04	0·89
Hillcrest	69·9	49·2	82·0	44·0	0·06	4	0·05	24th	0·06	...
Mapumulo	77·3	45·5	89·0	41·0	0·02	1	0·02	24th	0·02	1·22
Nongoma	67·5	49·2	79·0	44·0	...	...	...	...	...	0·64
N'Kandhla	63·5	49·9	72·0	44·5		...	...	..	...	...
Hlabisa	69·8	51·8	82·0	48·0	0·50	1	0·50	24th	0·50	1·09
Melmoth	75·5	46·8	88·0	40·0	0·01	1	0·01	24th	0·01	1·11
Ubombo	69·1	52·3	79·5	47·0	0·15	3	0·07	23rd	0·15	...
Eshowe...	71·7	49·4	85·0	42·0	0·26	2	0·24	24th	0·26	2·36
Nqutu	65·2	42·5	73·0	35·0	...	...	.	...	...	...
Point	...		...	...	0·06	1	0·05	23.d	0·06	...
South Coast Junction	...	...	.	...	0·10	4	0·08	23rd	0·10	...

OTHER STATIONS.

Estcourt	...	...	71	19	0·03	1	0·03	18th	0·03	0·77
Adamshurst	...	...	73	38	...	...	...	...	...	...
Hilton		...	81	57	...	...	...	...	...	0·52
Ixopo (Gorton) ...	...	...	74	38	0·24	2	0·17	28th	0·24	0·60
Mid Illovo (Isment)...	...	...	72	41	0·29	3	0·22	27th	0.29	0·68
Ottawa	.	..	...	...	0·03	1	0·03	23rd	0.03	1·45
Mount Edgecombe ...	...	.	79	49	0·03	1	0·0	28th	0·03	2·16
Cornubia	...	...	...	...	0·01		...	.	0·01	3·27
Milkwood Kraal ...	...		...	...	...	...	...	...	...	1·23
Blackburn	...	...	..	...	...	...	..	.	...	2·06
Saccharine	...	...	..	...	...	...	...	..	...	1·90
Prospect Hall... ...	...	...	...	...	0·07	...	...	...	0·07	.
Equeefa	...	...	85	50	0·44	4	0·18	24th	0·44	0·87
Umzinto (Beneva) ...	...	...	...	...	0·48	3	0·20	27th	0·48	1·01

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of July, 1901 :—

Name of Colliery.	Labour Employed. Above Ground. E.	N.	I.	Below Ground. E.	N.	I.	Coal raised. tons.	cwt.
Natal Navigation	12	28	120	9	269	121	10,007	19
Natal Marine	10	140	16	7	337	4	9,627	2
Dundee Coal Coy.	6	18	106	12	168	278	9,525	18
Elands Laagte	11	21	125	9	150	250	9,168	0
St. George's	11	82	20	7	140	0	4,019	0
Natal Steam Coal	4	52	12	2	114	14	2,644	0
Newcastle	4	9	12	3	105	0	1,375	0
Crown	*13	67	5	2	60	0	880	0
Inkunzi	3	12	0	1	48	0	680	17
†Dudley	5	39	2	1	17	0	644	0
West Lennoxton	1	1	11	1	7	20	502	0
No. 42 Colliery	8	12	14	3	60	0	462	18
Hillside Colliery	—	1	—	1	5	0	50	8
Total ...	88	482	443	58	1,480	687	49,596	2
Corresponding month (1900)	64	240	254	38	999	542	26,661	14

*Almost entirely employed on construction.
†One European and 9 Natives employed in sinking shaft not included in this.

Mines Office,
August 8th, 1901.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of July, 1901 :—

	tons.	cwt.
*Coal Bunkered	*23,174	11
Coal exported to Cape Colony	6,933	11
,, Chinde	84	7
,, Beira	98	13
,, United Kingdom	3	0
Total shipped	30,294	2

*Included in this item are 1,789 tons 14 cwt. of Imported Coal.

GEO. MAYSTON,
Collector of Customs.

31st July, 1901.

Veterinary Departmental Report for May, 1901.

ABSTRACTS FROM REPORTS.

(*Concluded.*)

DURBAN—D.V.S. AMOS.

Glanders.—During the month I found one suspicious horse upon the sale. I caused it to be at once isolated and tested it, but obtained no reaction to mallein, One horse I found in a private stable showing diagnostic systems of the disease. I destroyed the animal and made a *post-mortem* examination, which confirmed the diagnosis.

I have visited all the condemned stables during the month. Such stables are unsatisfactory premises to exist in a township. When once stables are condemned it should be imperative that they be made fit for use again, by the necessary disinfection and structural alteration ; or that they should be demolished. Condemned stables in this town are immediately used as the sleeping quarters for natives, which I think is against all hygenic principles

I again draw your attention to the fact that a plan of Durban should be made for this office so as to permanently show all such condemned stables and the history of same.

Tuberculosis. — One cow reacted to tuberculin at the compound and was destroyed. *Post-mortem* confirmed the reaction, and lesions in the liver I sent you. Two cases of tuberculosis occurred in Madagascar cattle at Mount Edgecombe. These animals were tested at Milkwood Kraal, but the temperatures were too fictitious to condemn.

Horsesickness has been extremely prevalent during the month. Deaths of eight per diem is the average for the month, and horses under all stabling conditions have succumbed. Success with treatment has been nil.

Lungsickness occurred in Mr. Caldwell's dairy, and I have specially reported upon it to you.

Influenza in horses has been common, and all cases have yielded to the ordinary stimulant and saline treatment.

HOWICK—D.V.S. BYRNE.

The Upper Umkomanzi Division.

Scab exists in this Division in a flock of 200, the property of Mr. H. Nicholson, Alton, and was bought at a Government sale in Pietermaritzburg on January 15th, and placed under license May 29th, only three affected at the time. There are no other scabby sheep in this Division that I am aware of.

Lungsickness. — The farms Glen Isla (Messrs. Turnbull & Co.), and Intembankulu (Mr. W. Gillespie), are still under license, but there are none sick, and the period of quarantine will be up in June unless there are fresh cases. Messrs. Geo. Hackland, of Durslade, *via* Richmond, bought 22 head of cattle (cows and calves) from Mr. Walker, Highflats, Ixopo, on April 1st, and on May 18th one got sick, which Mr. Hackland destroyed, and finding, in his opinion, lungsickness, reported and inoculated ; since that date he has lost ten, which, he thought, died of gallsickness. I visited Mr. Hackland's farm on June 4th, arriving late at night, and next morning held a *post-mortem* on a young beast which had just died, and found it to be, undoubtedly, suffering from lungsickness. I need hardly add that when Mr. Hackland found the first beast to be suffering from lungsickness he reported to the Stock Inspector, and was placed under license.

Blackleg.—At Mid-Illovo farmers have lost from blackleg, but have since inoculated against the disease.

Lion's River Division.

A second license under the Scab Law was issued to Mr. Jas. Morton, Tweedie Hall, on May 6th, for a flock of 2,100 sheep, of which 450 are affected. A flock of 1,450, the property of Mr. J. J. Morton, Sherwood, were placed under license for scab on May 28th, 400 being affected.

Loot horses are dying in great numbers from poverty. I do not think the purchasers will save more than thirty to forty per cent., even if that, by the time the winter is finished.

Umgeni Division.

The following are under renewed licenses for lungsickness.

A heard of 10 head, running at Zwaartkop, the property of Mr. T. Dawson, renewed license issued May 14th.

Mr. H. H. S. Moreland, Thorney Bush, license renewed May 28th.

A herd of 22, the property of Mr. C. Oldfield, Wilgefontein, renewed license issued May 1st.

A herd of 74, the property of Mr. W. Oldfield, Ambleton, were placed under a first license on May 16th, and 20 head, the property of Jonas (native), Slangspruit, on May 16th, and on May 17th, cattle, the property of Mr. W. Oldfield's natives, were placed under license for drenching.

Influenza, amongst horses, has been rather prevalent in my District.

I visited two little Shetland ponies which had arrived from Durban. Both had a bad attack of influenza. The usual treatment was carried out successfully.

I have had several cases of a similar nature during the month, and all have done well under treatment.

The next day I visited two horses which were damaged in a trolley accident, and had received wounds, bruises, etc. With the usual treatment, such as sutures, antiseptics, physic, and rest, both have done well.

With the exception of influenza, colds, and colic, most of my work this month has been of a surgical nature. For

instance, I visited a pony with an enlarged jaw, and after first carefully examining the mouth, expecting dental trouble (though this, from the history of the case, I hardly expected to find, as the pony ate soft or hard food, and showed no pain). From a very badly smelling nostril I suspected a diseased sinus.

The pony was cast, and trephined, a middle-sized trephine (or bone saw) being used, which removed a circular piece of bone about the size of a two shilling piece, from the face immediately over the air cavity. I then found the latter contained puss. This I scraped out thoroughly, washing out the sinus with disinfectants. The usual after treatment was ordered, and the pony is doing well.

I also had a case of a gelding at Botha's Hill, suffering from fractured pelvis. I placed him in slings, but am afraid he will not recover.

Correspondence.

To the Editor Agricultural Journal.

EARLY GREEN MANURING.

SIR,—Regarding Mr. T. L Fyvie's letter in the last issue of the *Journal*, I would not advise the use of "Johnson" grass for the purpose mentioned. It is a perennial plant, and said to be a splendid fodder grass, rapid growing with creeping rootstocks, but the decided objection to its use for turning in previous to growing another crop is the difficulty found in eradicating it and checking its spread. It is likely to become a serious weed in such a case as the present, and it is therefore more advisable to select a crop that can be kept under control.

Rye, rape, and vetches are all fast growing crops and likely to suit the soil mentioned; the first two are not leguminous plants and do not possess the unique power of that order to increase the nitrogen in the soil, but they will naturally benefit it by increasing the humus matter, making it more retentive of moisture, and facilitating the operations of releasing the plant food. The vetch is one of the leguminous order, and is a fairly fast growing plant.

Those plants of the latter order are the most suitable for green manuring, and were alluded to in a recent number of the *Journal*.

The amount of seed required per acre broadcasted would be for rye, 100 to 150lbs.; rape, 5 to 6lbs.; and vetches, 200 to 250lbs.

A mixture can be made of these, say of vetches and rye or rape and rye.

Johnson grass is not the same thing as millet; the former belongs to the tribe andropogoneæ and the latter to the paniceæ.

Yes; basic slag will help to induce a good growth, it will supply lime as well as phosphoric acid, and I expect the former is deficient in the soil; broadcast the slag as soon as possible, and plough it in at the rate of 3 to 4 cwts. per acre. The sooner it is put in the ground before planting the better, but do not be content with applying a phosphate only, give the catch crop an all-round manure, and the benefit of it will be had in the succeeding crop.

Nitrate of soda will be the most forcing manure to apply, but should be supplimented by a little potash, say 150lbs. sulphate or chloride of potash, or 250 to 300lbs. kainit. Apply the nitrate of soda as a top dressing at the rate of 160lbs. per acre.

ALEX. PARDY, F.C.S., &c.,
Agricultural Chemist.

THOROUGHBREDS *V.* HACKNEYS.

SIR,—In answer to Mr. Hutchinson's (V.S.) letter *re* Horsebreeding in *Agricultural Journal* of August 2nd, 1901, I beg to express my views.

He condemns thoroughbreds as useless for work. I cannot agree with him; for stamina there is no breed to equal him. The Free State horses which he condemns have proved him wrong—De Wet and others have been mounted on them all through the war. So far, they have not been caught by the breeds he so strongly recommends.

I am surprised that he is in favour of coarse breeds for endurance. It has been clearly proved in the hunting field no breed can compete with thoroughbreds. My personal experience, endorsed by men whose opinion is worthy of consideration, admit for hack, journey, and carriage work, the nearer you get to thoroughbreds the better they are.

Mr. Hutchinson condemns all the thoroughbreds that have been imported and have been on our local shows. If he is right, then he is the only judge in the Colony.

Mr. Hutchinson had charge of a stud in the Transvaal of the breed he so strongly recommends. After a trial, extending over years, he bred one colt—he may have bred others that were not known. The said colt developed a lovely ringbone, this was either hereditary or was caused by the *very* heavy shoes he put on him when a foal, in order to get the knee-action he claims for the breed. This colt foal was exhibited at more than one of our shows. Mr. Hutchinson also claims that the raising of the breed he admires will pay. May I ask why he could not make it pay for his late employer. It was rumoured at the time his employer sold out, and so cut his loss. Was it that the management was bad?

Yours, etc.

W. HENWOOD.

Rosetta, 12th August, 1901.

Domestication of the Eland.

INTERVIEW WITH THE GOVERNOR OF WESTERN AUSTRALIA.

IN the course of an interview with one of our representatives a few weeks ago (says the *Morning Herald*, Perth, Western Australia), His Excellency the Governor, while chatting about sporting and the hunting of big game in Africa, made a special reference to the eland, the best of all the antelopes. He said that, owing to its special qualities, it was gradually becoming extinct, and steps had to be taken to protect it from huntsmen. In view of this a *Herald* representative called at Government House yesterday, in order to get the opinion of Sir Arthur Lawley upon the suggestion which has been made that elands should be obtained from South Africa, and introduced into the various States, with the object of utilising what are now practically waste scrub lands.

"Yes, I read the article with great interest," said His Excellency, "but it appears to me that there will be great difficulties in the way of carrying out the suggestion. You know that I told you some weeks ago that elands were becoming very scarce, and I believe that there will be very great trouble in getting the animals. They are magnificent beasts, often the size of an ordinary bull. In fact, they are so heavy and so fat that they can be ridden down by a man on horseback, and killed. Have you ever seen the head or horns of an eland? No? Well, I have photographs of the beasts, and some heads just unpacked, and we will have a look at them by-and-bye. You will then see what fine animals they are.

"Yes, they are splendid eating. Their hides are of ordinary—not special—commercial value. But to return to the question of the importation of eland to Australia, I do not know yet what your country in the interior is like, but I do know that it should do well for eland. The climate also is practically the same as it is in Africa, and the beasts should thrive here. However, I cannot see how the difficulty of supplies will be got over. I know that when I was out there the eland were being protected very carefully. There was a fine of £500 to be inflicted on anyone found killing them. Mr. Cecil Rhodes, at the time of the beginning of the war, became very unpopular, as you know, in South Africa, and some of the people showed their spleen by killing some of his animals, included among which was a fine eland bull. He wanted to replace it, and tried to get another, but could not do so. He had therefore, to send out a party into the interior to catch one for him, and the expedition was out for a long time. The expense, therefore, must have been enormous, and it would

be a very costly affair to get one or two hundred beasts.

"It is considered very good if a hunting party catch from 12 to 20 eland in a year. It must be remembered that to catch one eland a great number have to be killed, for only the calves can be captured. And then there is the trouble of bringing them into captivity, and, to a certain extent, taming them. At certain times of the year the eland become very ferocious, and it is very difficult to get them to flourish in captivity. You see, before they could put them on board ship bound for Australia, they must be trained to eat chopped chaff, etc., and that is not a very easy matter.

"However, if these obstacles can be removed by the expenditure of what I am afraid will be a considerable sum of money, it will be a grand thing to establish eland in Australia; but why do you restrict the imports to eland? There are many other kinds of antelopes in Africa, all of which would do splendidly out here, and they would be obtained more easily than the eland. For instance, there is the roan antelope and the sable antelope, both of which are very large beasts. The scarcity of eland is shown by the fact that all the time I was in Africa I saw only two herds of them in their natural state. I can tell you that I sincerely hope we will be able to get the antelopes established here, and it will be splendid if we can thus utilise our waste lands. Now, let us go and have a look at those photos and heads."

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker & Co. write:—The market all round is far from brisk; in fact, supplies very far exceed the demand. This applies specially to mealies, which are more abundant and cheaper than they have been for years, and unless a market soon opens for this grain there will be a poor outlook, not only for producers, but for some speculators whose stocks are large.

Mealies.—Mealies on the market have varied between 4s. 4d. and 5s. 4d. per 100lbs., including sack.

Forage.—A few samples offered at prices varying between 7s. and 13s. 3d. per 100lbs

Hay.—A fair quantity offered daily; whilst some samples have been so low as 1s. 6d. and 1s. 10d. per 100lbs., others have been knocked down at 3s. 2d., 3s. 4d., and 4s. per 100lbs. Bedding from 5s. 6d. to 22s. per load.

Potatoes.—Good table potatoes have been almost every price between 11s. and 18s. 9d. per 100lbs.; sweet potatoes from 1s. 6d to 5s. 9d. per sack.

Beans.—Common red beans from 7s. 9d. to 11s. 9d. per 100 lbs.; Canadian Wonder, from 15s. 3d. to 21s. 6d. per 100lbs.

Mabele.—From 5s. to 8s. 7d. per 100lbs.

Pumkins.—From 2s. to 7s. 9d. per dozen.

Onions.—Prices still rule high, and although 16s. 8d. per 100lbs., or 2d. per lb, was at one time considered a fair figure, lately very few lots have been sold under 25s., and as high as 29s. 2d. per 100lbs.

Poultry.—Common fowls from 1s. 8d. to 4s. each; geese, 7s. 9d. each; ducks, from 6s. 9d. to 13s. 6d. per pair; turkeys (cocks) from 13s. 3d. to 18s. each, hens from 8s. to 9s. 6d. each.

Eggs.—From 1s. 3d to 3s. 6d. per dozen.

Butter.—From 10d. to 2s. 1d. per lb.

Sundries.—Mutton, 4½d. to 9d. per lb.; pork, 2½d. to 8d. per lb.; bacon, 6d. to 10d, per lb.; ham, 8½d. to 9d, per lb.; venison, 10d. to 1s. 1d. per lb. Under this head we include sugarcane, which has come forward in considerable quantities from Mid Illovo, and has been purchased by dairymen of the the City for feeding purposes.

Vegetables.—Cabbage, carrots, cauliflowers, celery, onions, beans, peas, potatoes, and turnips comprise the varieties offered.

Fruit.—Apples (imported), bananas, lemons, naartjes, oranges, papaws, and pineapples have been offered daily.

Firewood.—From 6d. to 11½d., and as high as high as 1s. 5d. per 100lbs.

Messrs. J. Raw & Co. held a sale of cattle, horses, &c,, at the farm "Eastwolds," Ixopo, on the 1st instant, being instructed by F. L. Thring, Esq., executor to the estate of the late Reginald Raw.

A good attendance at the sale made keen competition, and prices realised all round were good.

Mr. R. H. Raw was the auctioneer, and prices were as follows:—Cows, £19, £16 10s, £16, £18, and £17 15s. per head; itoles, £12 15s., and £13 5s. per head; heifers, £15, £19, and £19 5s. per head; trek oxen, £14, £16 10s., and £17 per head; bull, £15 10s; horses, 17½ gns., 10½ gns., 19½ gns,, and 11 gns.; entire, 30 gns.; yearlings, 6½ gns; fillies, 9 gns., 12 gns., and 13½ gns: mares, 9 gns., 13½ gns., 7½ gns., and 10½ gns.; colts, 7½ gns; carriage and harness, £28; mowing machine, £5 5s.; and a host of sundries at good figures.

The Agricultural Journal

AND MINING RECORD.

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CONTENTS.

Horsesickness Investigations.

BY H. WATKINS PITCHFORD, F.R.C.V.S.

(*Continued.*)

THE fact of the conjunctiva or mucous-membrane of the eye being constantly inflamed—or "injected," as it is termed—to a degree more or less marked, is probably of small significance in consideration of the ætiology, or cause, of the disease. One recalls the frequency of this symptom in Rinderpest, Rabies, Influenza and Bubonic Plague. That infection through the conjunctival-membrane is possible would seem likely from recorded cases of Glanders, or specific Iritis, contracted in this manner, where contagious particulate matter has gained access to the eye. There seems, theoretically, no reason why such infection should not take place in the case of Horsesickness, although no evidence has yet been brought forward in support of the theory. I have failed to induce the disease by spraying contagious fluids into the conjunctival sac. The fact again of other animals in close contact with an infected horse remaining free from disease would seem to point to its non-volatile nature.

That flies might prove the bearers of the contagion from the eye of one animal to another is possible, but purely conjectural, especially when one considers the habit of the ordinary Muscæ, and their quiescence during the time which—by the strongest weight of evidence—is looked upon as the most dangerous.

To complete the brief survey of this theory there remains the question of the possible agency of Intestinal Parasites, which are probably never absent in the South African herbivora, but are always to be demonstrated by careful inspection of the intestinal contents.

The frequency with which the larvæ of the Œstrus Equi (Bots) are noticed in *post-mortem* reports of the disease should not remain unnoticed in view of the manner in which the integrity of the gastric membrane is affected by these parasites. No confirmatory evidence, however, exists in this case, either pointing to the probability of such a factor obtaining in the ætiology of South African Horsesickness.

Upon a consideration of the various theories as set forth above, the evidence of the greatest weight seems to lie in favour of what I have termed the Inoculation Theory. All the features of the disease most difficult to understand seem reconcilable to a greater extent to this theory than to others mentioned. While much work has been done in the past it is probable that still more remains for the future. In my own researches into this disease, meagre as they have been, and hedged about by many limitations, I have sought rather to probe into the difficulties surrounding the cause of the disease than to devise means for its actual cure or prevention, believing that the quickest way of establishing the Prevention upon a sound basis lies primarily in the recognition of its Cause. The difficulties in the path of the enquirer are unusually great, seeing that no organism is discoverable, and that the actual mode of production of the disease is equally obscure. Another serious difficulty — appreciable only by those who have undertaken research work of this nature—is that the malady is practically untransferable to other animals than those of the Equine species. Were it possible to produce the disease in guinea-pigs or rats, or other easily obtained and inexpensive animals, there is no doubt that the investigation of the disease would be much lightened. Horses, on the other hand, are procurable only after difficulty and expense, and it may be that the very economy which it is imperative to observe in conducting an investigation to any extent leads to the use of the class of animal not the most suited, by reason of age and environment, to the enquiry in hand.

As far as I have been able to judge the endeavour directly to prevent or cure the disease has met with so small a measure of success as to be unsatisfactory, and I am at present of the opinion that no preventive inoculation is likely to give permanent satisfactory results.

To those who are impatient for practical results I would refer to the labours of such men as Koch and Pasteur, where many years of assiduous labour in solving the problem of eradicating an obscure disease has met with but partial success.

Koch is to-day, in the light of a mature and unique scientific experience, labouring, with every facility at his disposal, at the disease tuberculosis, and as we all know, his work is far from complete. Unlimited time, extended knowledge, much expense, and great thought, are necessary to the undertaking of an investigation into an obscure disease, and the prospects of success in such work are not heightened when able and experienced men of science have already thoroughly exploited the field, and found it "stale and unprofitable."

The future, however, for the horse-owner, and particularly for the horse-breeder, is not a hopeless one. Investigators have already accumulated a mass of evidence — much of it negative in nature, but still valuable, about the disease horsesickness, and progress is continually being made towards a successful solution. In conclusion, I would ask the Natal agriculturist to briefly review in his mind the possible causes of the disease which I have laid before him, and bring to bear upon them his past experience.

Many have already written to me their opinions on the subject, some dissenting but many concurring with my inclination toward Inoculative Theory, as being the most probable solution of the difficulty.

For the present I only feel free to state that my experience and investigations into the cause of the disease have led me to the provisional adoption of this as the most probable theory. As time goes on, the experiments which have induced me to lean towards this opinion will be placed before the public, but, as I said in the earlier part of this article, I consider it a matter for regret that immature and inconclusive results should be placed in the hands of the public before time and extended experience have produced the proofs which alone warrant publicity.

District Reports.

BULWER, 22nd August.—The fortnight ended has only been eventful in extreme cold. On the 13th inst. a few very refreshing showers fell in the vicinity of Bulwer, followed by dull, cloudy days on the 14th and 15th ; then the cold winds started, and for four days it was very trying to all kinds of stock at all thin or old. For several mornings heavy frosts have fallen, and the grass, which was springing fast, has been cut off, but as the weather is now much calmer I have no doubt it will soon make headway again. Except for the lungsickness on the farm Fairacres, of Messrs. Miller Bros. all kinds of stock are free from disease in the Division, as far as I know. The condition of the stock is about the same as is usual this time of the year : when they get on to the burns they fall off very considerably in condition, but soon pick up again when the grass springs up. Mealies are being offered for sale freely by Natives, but there is not much demand for them. The wheat and rye crops at the Reichenau Trappist Station on the P lela look very healthy. The fruit trees are now commencing to bud. The earlier kinds are already in blossom, notably the plum trees, giving the orchards a picturesque appearance.

H. W. Boast, Magistrate.

DUNDEE, 19th August, 1901.—Lungsickness is not so prevalent here as it was when I last reported, but it will be impossible to stamp it out until captured and looted stock cease to be brought into the Division. Although there seems to be any number of sheep in the neighbourhood, it is difficult to get any but Australian mutton from the local butchers. Fowls are very expensive and eggs scarce in Dundee, but I believe they are cheap and plentiful enough at the Native kraals. There is great difficulty in obtaining Native labour, probably owing to the higher wages paid by the military. We had a splendid downfall of rain last week, which has brightened things up generally. The windy season has commenced : may it be a short one.

W. G. Wheelwright, Acting Magistrate.

HLABISA, 22nd August.—There is little of interest to report from this District. Dry weather has prevailed during the month, and grass, which at the beginning of the month was very green, has browned considerably, although, of course, there has been no frost, which, I think, is unknown to this District. A fair crop of mealies has been harvested by the natives, and they have commenced sowing again on the Coast lands. Stock, which comprises cattle chiefly, is in good condition, and the District is practically free from disease. A few cases of gallsickness have come to my notice recently.

R. D. Talbot, Acting Magistrate.

HOWICK, 27th August.—The total rainfall for the past fortnight was 1 80 inch, rain having fallen on five different dates. On the night of the 24th instant a steady rain commenced to fall, and continued until the night of the 26th inst. This rain is worth thousands of pounds to the District, since it will minimise the death-rate among the stock, especially sheep, for the approaching lambing season. The grass, which was very backward, has commenced to spring rapidly, and can already yield sufficient food for sheep. The farmers of the District have taken full advantage of the long period of dry weather, and have disposed of most of their crops, which have realised very high prices, with the exception of mealies. During the past fortnight the maximum temperature was 86 deg., registered on the 12th inst., and the minimum during the same period was 28 deg.. on the 22nd inst.

J. W. Cross, Magistrate.

IMPENDHLE, 26th August.—The winter in this District set in late but suddenly with cold nights and heavy frosts. It soon became warmer, however, and the winter, which is now over, has been a mild one, 10 degrees of frost being the highest record during it, as against 16 in previous winters. After a long spell of dry and hot weather we have had a splendid soaking rain, which, commencing on the 24th, lasted until the afternoon of the following day. The grass was already springing, and will now come on rapidly. Scab is more prevalent than it has been in past years, several flocks in the Division being infected with the disease. The outbreak of lungsickness which occurred some three months ago appears to have been checked by the inoculation, only one or two head of cattle having died, I believe.

Chas. Boast, Magistrate.

NEW HANOVER, 28th August.—The aspect of the country in general has been greatly im-

proved by the last splendid rainfall. The young grass is thriving well, and ploughing will soon be the farmers' daily work. Influenza among horses is gradually dying out. There have been no complaints from Natives about scarcity of food this winter. The rainfall in the location during last summer was somewhat greater than on the farm lands.

A. RITTER, Magistrate

NQUTU DISTRICT, 1st August.—The past month has been a trying one: high and biting winds prevailed almost throughout, and during the month no rain fell. As a consequence the whole country looks parched and dreary. Lung-sickness is still bad throughout this District, but I am glad to say that a Stock Inspector has now been appointed and has taken the matter in hand. All crops are reaped now, and mealies can be bought at from 6s. to 7s. 6d. a muid. There has been a deal of sickness about during the month, chiefly of the influenza type.

C. HIGNETT, Magistrate.

UMLALAZI, 25th August.—The early rainy season of the coast seems to have fairly set in now, copious rains having fallen. At the time of writing it is raining steadily: during the past twelve hours 1·4 inches of rain has been registered, and we have every prospect of having an old-fashioned three days' rain. Cultivation is going on, and I yesterday noticed some young mealie plants nearly six inches high. Since my last report two fresh outbreaks of lungsickness have been reported to me, and the disease appears to be spreading in the District, notwithstanding the energetic efforts of the Stock Inspector, Mr Gielink, who is doing all he can to check it. I have heard of no fresh cases of anthrax.

J. J. JACKSON, Magistrate.

Eleanor A. Ormerod, Entomologist.

OBIT: JULY 19TH, 1901.

IT is difficult to express the full measure of regret on the passing of one around whom has grown that peculiar glow of friendship which can only exist between those who have not met, but whose acquaintance has been born in the cold formality of correspondence and ripened and borne the fruit of friendship in the same cold ground. Such is the regret which holds us whilst we record the death of Miss Eleanor A. Ormerod, and such must also be the sorrow of many of her South African readers—particularly in Natal, where her name and her work are known and respected.

Miss Ormerod was in her seventy-fourth year at the time of her death, and was perhaps better known to South African farmers from her book entitled *Some Injurious Insects of South Africa*; her work in England, however, is also well known and appreciated in Natal, where associations with the old country remain so fresh and green in every walk of life.

But a year ago the honour of the degree of L.L.D. of the University of Edinburgh was conferred upon Miss Ormerod, she being the first lady to receive this distinction. Her life's work was devoted unselfishly to the study of injurious insects, in which branch of the science of entomology she was one of England's pioneers, and its results were placed, without hesitation and ungrudingly, at the disposal of the agriculturist and horticulturist.

In her voluminous reports and many works the deceased lady has left behind her a monument for all time among the farmers of England and her fellow-workers in every land, from whom she has long enjoyed all that homage and respect due to a benefactress, a scientist, a woman and a friend.

C. F.

One of the hardest rides on record was made by Captain Evans Gordon, in 1891. He left Leh, on the borders of Tibet, at 3 a.m. on October 10th, crossed two lofty passes, 13,300 and 13,000 feet above sea level, and got to his first halting place, Dras, at 9.30 p.m., having covered 151 miles in under eighteen hours. After seven hours' rest, Captain Gordon started again, in a blinding snowstorm: the weather was so bad that in two hours he covered only twelve miles. Deep snow hindered him on the next stage of his journey, and when he reached lower country he found the track almost impassable from heavy rains. Eventually he reached his destination, Srinagar, the capital of Cashmere, at 8 in the evening, having travelled 250 miles over the lofty and rugged mountain paths in 33 hours. He changed his pony at 25 different point of the journey.

Pedigrees of Mr. Hosking's Bulls.

THE following are the pedigrees of five young bulls, one Devon and four Shorthorns, and one Shorthorn heifer, imported by Mr. O. Hosking. They arrived by S.S. *Umtata* on 1st instant :—

Heifer "RUTH," red, with little white, calved 28th October, 1900. Dam : "Ruth," by "Sir James" (entered as produce of his dam in Herd Book Vol. 39, page 236. Sire : "Staffordshire Lieutenant" (No. in Coates Herd Book, 75733). G.D. : "Ruth," by "M.C.," 31898. G.G.D. : "Ruth," by "Croesus," 30820. G.G.G.D. : "Ruth," by "Lord Montgomery," 26686. G.G.G.G.D. : "Ruth," by "Duke of Manchester," 33690.

Bull "CORNISHMAN," roan, calved 13th October, 1900. Dam : "Ruth," No. 73, by "British Wonder," No. 55420. Sire : "Campoz" (No. in Coates Herd Book, 70087). G.D. : "Ruth," No. 69, by "Frantic," No. 72558. 3rd D. : "Ruth," No. 55A, by "Star of Arundel," No. 48784. 4th D. : "Ruth," No. 36A, by "Lord Ringlet," No. 38655. 5th D. : "Ruth," No. 25A, by "Earl of Trawsley 3rd," No. 28506. 6th D. : "Ruth," No. 23A, by "Sir Lawrence," No. 35581. 7th D. : "Ruth," No. 10A, by "Townley Grand Duke," No. 27673. 8th D. : "Ruth," No. 6, by "Lord Fingal," No. 11716. 9th D : "Ruth," No. 2, by "Frantic," 8088. 10th D. : "Ruth," No. 1, by "Harold," No. 8131.

Bull "CORNISH GWYNNE," red, calved 14th November, 1900. Dam : "Dorothy Gwynne" (Volume 45) by "Vanity 4th," No. 61926. Sire : "Rifleman" (No. in Coates Herd Book, 77642). G.D. : "Auburn Gwynne 2nd," by "Prince Kirklivington 4th," No. 59682. 3rd D. : "Auburn Gwynne," by "Baron Winsone Oxford," No. 45952. 4th D. : "Ada Gwynne," by "Baron Hillhurst," No. 41037. 5th D. : "Baigton," by "Lally's Hillhurst Duke 2nd," No. 38539. 6th D. : "Alice," by "Duke of Wellington 2nd," No. 28465. 7th D. : "Flora," by "Oxford Gwynne," No. 24711. 8th D. : "Fairy," by "Grand Duke 5th," No. 19875. 9th D. : "Fortuna," by "Duke of Leicester," No. 17724. 10th D. : "Frances," by "Capt. Hardinge," No. 10023."

Bull "BARTELIVER," red, calved 25th November, 1900. Dam : "Daisy 57th," (Vol. 42, page 470), by "Vanity 4th," No. 61926. Sire : "Masterpiece" (No. in Coates Herd Book, 75041). G.D. : "Daisy 20th," by "Lord Trewithen," No. 56101. 3rd D. : "Daisy 18th," by "Cornishman," No. 55501. 4th D. : "Daisy 12th," by "Cornishboy," No. 39627. 5th D. : "Daisy 10th," by "Lord Montgomery," No. 26686, 6th D. : "Daisy 9th," by "Duke of Manchester," No. 33690. 7th D. ; "Daisy 8th," by "Rufus," No. 35423, 8th D. : "Daisy 4th," by "Sir Rodger," No. 18863. 9th D. : "Daisy 3rd," by "Vandumper," No. 23114. 10th D : "Daisy 2nd," by "Henry 2nd," No. 14689.

Devon bull : "NATAL PRINCE," calved 7th January, 1901. Sire : "Major," No. 1011. G.S. : "Staberton Hero 2nd," No. 686. G.G.S. : "Masher," No. 326 Dam : "Dolly," No. 2275. Sire : "Cecil Rhodes," No. 461. G.S. : "Raglan," No. 110. Dam of "Dolly" : "Doris," No. 75. G.D. : "Dorothy," No. 76.

Bull : "LORD CARVOSSA," red, white spots, calved 1st December, 1900. Sire : "Romeo," (No. in Coates Herd Book, Volume 47 not yet published). Dam : "Cranberry" (Vol. 42, page 464), by "Fitz Rose," No. 57263. G.D. : "Dewberry," by "Mayfly," 51739. 3rd D. : "Strawberry," by "Harold," 44920. 4th D. : "Cherry Blossom," by "Albert Edward," 36108. 5th D. : "Cherry," by "Clint," 33399. 6th D. : "Old Cherry," by "Clint," 33399. 7th D. : "Old Cherry," by "Star Prince," 18925. 8th D. : "Old Cherry," by "Savernake," 35475. 9th D. : "Violet," by "Mazeppa," 34831. 10th D. : "Violet," by "Warrior," 6660.

Fowls will often do well on a small place for several years, and then fall off and become unprofitable, just as the owner thinks he has learned it all. The usual reason is either that the stock has become run out by too much confinement, or that the fowls have used up some of the things about the place which they need. They have killed out the grass, used up all the sharp gravel, or perhaps the soil has become infested with disease or the coops with lice. A thorough renovation of the place or a move to fresh ground then becomes necessary.

Gleanings.

The official return of farm animals in the United States for 1899 shows 16,292,360 milch cows, and 27,610,054 other cattle; 13,537,524 horses, and 2,086,027 mules. It is worth noting that whereas the average price of horses is put at 44.61, the average price of mules is 53.36, or, roughly, about £2 per head higher.

Cold storage plants, which in the last few years have been erected all over the country, have, says the "American Cider and Vinegar Maker," proved of inimitable value to both consumer and purchaser. They have relieved the market of serious gluts early in the season, and have kept the fruit in perfect condition until late in the spring following.

The earliest notice of racing in Scotland occurs during the reign of James IV., in 1504. On April 15th in that year the Lord High Treasurer of Scotland notes in his accounts payment of a sum of 18s. "to the boy that ran the King's Horse" at Leith The sands of Leith were used as a racecourse till 1816, when the annual meeting was transferred to Musselburgh.

Professor Gilchrist at the last meeting of the S.A. Philosophical Society exhibited a new deep sea fish that had been caught off the Natal coast. It is chiefly remarkable for its enormous mouth and head, which are seven or eight times the size of its body. Only three forms of this fish are known, one specimen having been found at Madeira in 1864, and two others by the Challenger Expedition in mid-Atlantic. Scientifically, however, the present specimen belongs to a new species, differing in important details from those discovered at Madeira and by the Challenger Expedition.

General Sir F. Fitzwygram, in the new edition of his "Horses and Stables," publishes a letter from Mr. Wilfrid Scawen Blunt concerning the breeding of Arabs in England. Mr. Blunt says that this experience shows it easily possible to grade up the Arab to 15h. 2in. or 15h. 3in. by careful mating and high feeding; but that the Arab, when bred to this abnormal size, becomes leggy, loses his compactness, and by degrees loses the peculiar character of the breed. These big Arabs are, in a word, failures. The good qualities of this horse are at their best in the animal of average height, viz., 14h. 2in. and for the last twelve years or more Mr. Blunt has aimed at uniformity of height, 14h. 3in. as the maximum, and 14h. 1in. as the minimum for his brood stock. Mr. Blunt's experience is confirmed by General Fitzwygram, who points out that Arabs bred in the comparatively damp region of the Persian Gulf grow bigger than the desert-bred horse, but lose much of their valuable character.

It is estimated by the best authorities that the quantity of phosphate rock required last year to supply the world's demands was 2,850,000 tons, a vast amount to mine, handle, wash, and place on shipboard; and, as Europe alone consumed nearly 2,000,000 tons, it may be of interest to state that the sources of supply were as follows:—Florida, 500,000 tons; South Carolina, 100,000 tons; Tennessee, 150,000 tons; Africa, 400,000 tons; France, 350,000 tons; Belgium, 300,000 tons; and Russia and Norway about 50,000 tons. In addition to this, about 900,000 tons were consumed in America and 50,000 tons in Japan and Australia.—(Foreign Office Annual Series, 2,572.)

Mr. Eden, writing of stock-raising in his book, "My Wife and I in Queensland," observes that "all cattle as loosely herded as ours will deteriorate slightly, the lost principle, however, being soon restored by domestication. Amongst the milking cows on a station you see as fine points as you would in her well-bred English sister, and most likely her calf will be better still; while the offspring of the same, if allowed to run wild, become in a short time stunted and ugly, and, whilst losing all the better qualities, seem to imbibe a downward strain which soon renders them unrecognisable as coming from the same fountain-head. Of course, this is traceable to the early throwing together of the sexes, the offspring being always dwarfed and ill-grown. Soon after my arrival in the colony, I remember being struck by the curious sight of a heifer sucking her mother, whilst her own calf was actually sucking her; and since then I have seen the same thing repeatedly."

Counting sheep sounds a simple business, but it is really "a duty which requires a great deal of practice," says an Australian colonist. "In the morning is the best time, when, instead of throwing the yard gate wide open, it is only partially unclosed, allowing two or more sheep to pass out abreast, according to a man's proficiency in counting. Some, from being always at this work, can count six abreast, but most people content themselves with two. The shepherd stands near the gate, with a smooth stick and a knife, with which he cuts a notch in the stick at the end of each hundred, when the counter cries out 'tally. It is a very fatiguing operation: the eye and brain become giddy, and reel from so long resting on the moving mass, and the attention must never flag nor any attempt made to rectify an error, or you are utterly lost. In the morning they pour out very rapidly, jamming and jumping over one another in their anxiety to get out to feed, so, if you have not thorough confidence it is better to reserve your counting until the evening, when they walk in quietly enough."

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 2nd October next :—

Howick.—Red ox, white spots under belly ; red ox.

Springfield.—Blue mare, no brands, long tail, rather thin, impounded by J. Lawford. Running on Mr. H. Brown's farm, "Glenare," and too wild to be driven to the Pound : — Grey mare, branded SZ, very thin, brand indistinct.

Umsinga. — Dun-and-white heifer ; black heifer ; red heifer ; black itole, white tip to tail ; black itole, white marks on face ; bay mare, 14.1, faint broad arrow off rump.

Nqutu.—Black goat.

Richmond.—Black ox (bull stag), grey head, rump, and tail, no brand.

Mossdale—Lungsickness having broken out in the Pound at Mossdale, the sale of cattle advertised to take place on September 18th has been postponed for six weeks.

Examination as to Soundness.

Look to the Head.

BEFORE the examination of the head is finished, the buyer should feel over, as well as look over, the ears and poll. A fistula in the lobe of the ear may be sponged dry, and not be discovered until the bargain is sealed. Poll evil may be temporarily healed, and a broad bridle conceal the tell-tale scar or hairless spot, where a skilful operator has performed with caustics. From the poll and ear, the hand comes down the channel and passes under the jaw in a search for a "jug." This is a vulgar term for a submaxillary gland which has become adherent to the inner aspect of the lower jaw, as the result of glanders or farcy.

It is not a very reliable symptom, but, taken in conjunction with a discharge from one or both nostrils, and a leaden-coloured membrane, should make the purchaser pause, and insist upon a professional examination as a condition of purchase ; if otherwise, the animal is approved.

The Diseases of the Eye.

The eyes will next receive serious attention. Although there are some defects of vision which expert veterinary surgeons have difficulty in discovering, the majority of them may be detected by the observant horseman. A fair, full look in the face of the horse will tell one if both eyes are equal in size, or the globes equally exposed between eyelids unaltered by puckers or contractions. Any apparent difference should lead to more careful scrutiny. If the palpebral fissure is disposed to be triangular, one may suspect previous inflammation, though the humours appear transparent from a superficial view. A note should be made for use in the stable presently. The front of the visual organ should be clear. Any spot on it, such as an opaque cloud or nebula, is an objection. It is not cataract, as frequently spoken of by horsemen. As often as not it arises from the lash of the whip which has caught it, and caused temporary inflammation—a rapid clearing of the lymph with which the layers of the cornea were at first suffused ; but a permanent scar, called a nebula, is left exactly where the membrane covering the cornea (conjunctiva) was originally injured. Such blemishes depreciate the value of a horse, and constitute technical unsoundness, but their effects upon the behaviour of individuals are singularly variable. One will shy "like billy-ho," and another will behave exactly as he did before the opacity was there. There is no excuse for the man who cannot see a cloud of this kind on a horse's eye, but cataract is quite another thing.

Cataract.

Further examination of the visual organs must take place in the stable. The size of the pupil, or opening inside

the eyeball, is, of course, due to the contraction or expansion of the iris or movable curtain which has two orders of fibres ; the one radiating like the spokes of a wheel, the other circular. The shortening or contraction of the first variety of involuntary muscular fibres enlarges the pupillary opening. The contraction of the circular fibres contracts it. Light is the only thing necessary to stimulate the circular fibres to contract and diminish the pupil. Comparativeness, darkness, causes the radiating fibes to act, and admit what light there is to be obtained. If these simple facts in connection with the pupil and its regulation by the movable curtain (iris) are borne in mind, a "glass eye," so-called, will be detected When the outdoor examination took place, the pupil was comparatively small ; when brought into any but a very light stable, the pupil will immediately enlarge. In the stable, in a low medium of light, preferably a dark, loose box, a wax match will enable the examiner to look into the eye and see if the lens is clear. Any opacitv of the lens is called cataract, whether affecting its substance or its capsule, and in animals is beyond treatment, for the reason that they cannot be trusted with spectacles, and not because the same operations as performed on men would not equally well succeed.

Any opacity, however small, in this part the eye must condemn the horse as unsound. Some subjects of cataract are dangerous or habitual shyers, while others give no trouble. Many an honest man offers a horse for sale without the least idea of the presence of cataract, which a veterinary surgeon will at once detect.

Coming to the Legs.

It is now a matter of individual preference as to how to proceed with our examination. Those who desire to look smart so arrange that they shall not twice go over the same portion of the animal. I will assume that the reader is more concerned to avoid a mistake. As pointed out in a previous paper, he will endeavour to secure a quiet quarter of an hour for the subject to get cold in, and display navicular lameness when he comes out for his final overhaul. One should stand in front and look between his legs, and note their relation. In a general view, the examiner will see if he turns his feet out or in ; a matter determined more by the way the fore limb is put on than the actual shape or trend of the hoofs. Enlargements either on the fore or hind limbs are best seen in this way ; for, if any exist, they will not be likely to match either in their size or position. A similar view from behind should be taken, and the size and shape of the hocks noted. A spavin will be looked for from both ends Such defects as curb will be best observed from a side view. The viewing here insisted on does not take so long as describing it. We next proceed to feeling. We left off feeling at the head, when we were satisfied that no poll evi or "jugs" existed. We may now press our thumb in the channel of the neck until the blood in the jugular vein accumulates like a thick cord above it ; the blood escapes immediately we release the pressure, and we know that the vessel is pervious : that is to say, the animal has not been bled with a rusty fleam, and obliteration of the jugular vein, as a conquence of subsequent inflammation. It is convenient, at this stage, to run down the limb, feeling carefully for blemished knee. However small the blemish, we shall find it if we turn the hair the wrong way and feel for any thickening, then smooth it down again lightly, and see if it readily falls into place. A few coarse hairs with a disposition to cross one another will almost invariably be left if there has been ever so slight a damage sustained at this important point.

Knee Spavin or Splint

should have been seen when comparing the outlines of the two limbs, but the opportunity is now afforded of comparison under the fingers. Splints in the everyday situation will be noted, and in a mature horse excused. If they are too far back to clear the ligaments and tendons, they may constitute a serious cause of unsoundness. In a horse under five years old, one should regard them with greater disfavour ; they may cause him to go lame as soon as put to work, but with a six-year old, or seasoned animal, they are probably set, and not very likely to cause trouble.

A Chat with Mr. Willie Nicholson.

BIRD-PROOF MABELE: NATIVE DRUGS.

By Ergates.

EIGHT miles on the road to Kokstad from Richmond lives Mr. Willie Nicholson. He is one of the largest cultivators of the district, and although he disclaims any pretence whatever to be quoted as an authority on farming, yet I felt sure, from what his friends said of him, that I should be able to find matter in an interview that would be interesting and profitable. It is a matter of regret to me that in reproducing our conversation I shall not be able to convey any idea of the keen, animated, and interested manner in which he answered my incessant strings of questions.

Early Days.

In 1871 Mr. Nicholson definitely settled as a farmer on his farm Theddon. Previously he had been principally engaged in supplying the Durban market and sugar growers with meal and mealies, taking return loads of transport to Maritzburg—a business most of the farmers were engaged in between 1857 and 1870.

"How we did have to work in those early days! Often as a youngster I started from here at two in the morning with a load of mealies for the mill, and was back by breakfast time ready to begin a day's ploughing. Yes, Kafirs had not become drivers then, and ploughing was also white man's work. Then there was also the difficulty of selling. The most of us in this neighbourhood used to take our produce to Durban, and there literally hawk it about. Bacon was the most profitable stuff, but it had to be sold piece by piece from the wagon On one occasion I had a most exasperating interview about my bacon with a woman who kept a boarding house. This led, however, to the selling of all that I had remaining to one who is now an old friend and a well-known Mooi River farmer. Thereafter I never had any difficulty in disposing of all the bacon I might take down. Cattle in the Fifties were cheap; a span of good oxen matched in colour were worth £3 a head, and the two after oxen £5 each, and the way in which those after oxen could hold back was a sight! I have seen carts, each containing 13 muids of mealies, come down the worst parts of the old Dutch road of the Town Hill being held back solely by the after oxen. Those were the days of the reimschoen, and such a bother was the operation of fixing and releasing it, that the holding back was left to the oxen unless the descent was closely approaching the perpendicular. The advantages of the present day wagon brake were by no means quickly appreciated. I remember meetings of transport-riders being called at Durban to discuss the advisability of adopting the new-fangled apparatus. The releasing of the reimschoen from the wheel was not an easy matter for the uninitiated. I remember that when still a mere boy—I was only 14 when I began transport riding in 1857—I saw a big, powerful old Yorkshireman tugging at his chain with all his might, and unsuccessfully. I strolled up and, in a lofty and superior way I am afraid, I told him the job was an easy one if he only knew how to do it. This nettled him, but he was so hot and blown as to be willing to listen to any advice. I took out my knife deliberately, and cut some of the roadside grass, putting it in front of the shoe. 'Pull when the oxen move,' said I. He did pull; he pulled as before, and the shoe flew up, and he, not expecting so little resistance came into hard contact with the wagon. I can almost see him now, satisfied in expression, yet writhing with pain, as he said, 'Well, boy, thou hast learned me a good trick.'"

Before leaving the "old days," I must refer to a couple of interesting documents shown to me by Mr. Nicholson. The first was a long letter, dated 31st January, 1855, from the late Sir W. Sergeaunt, then Colonial Secretary, asking Mr. Nicholson's father to raise, in the Richmond District, men for a volunteer mounted corps. This movement was the origin of the Natal Carbineers. The second was a regimental order of 1860, calling out the Richmond

troop for escort service to the late Duke of Edinburgh—much the same as the order for similar service issued in respect to the recent visit of the Duke and Duchess of Cornwall and York.

Cultivation.

The cultivation is in three different localities—about the homestead, down a valley about a couple of miles away, much of the land being under water from a three mile furrow, and at Doornkloof, on the banks of the Umkomanzi, where there is a furrow of a mile. Roughly, I should respectively describe the localities as warm, very warm, and hot. About the homestead sugar cane for fodder thrives well. Crops of potatoes, etc., grown at Doornkloof, reach maturity a month earlier than at the top farm.

Mabele.

What most struck me was a kind called by Mr. Nicholson the bird-proof. One of the greatest drawbacks to mabele cultivation, as many know only too well, is the difficulty of protecting it when reaching its ripening stage. Kafirs can generally find plenty of children and old women for the work, but the white man only rarely has the labour at hand or to spare. Therefore a bird-proof mabele should be popular. The plant is of average height, and the grain is larger in size, and perhaps slightly superior in quality. The grain heads, instead of standing erect, droop downwards, and therein lies the safety from the attention of birds. Whether future generations of birds will be baffled by this disposition of the seed is another matter; at present the corn escapes from their depredations. Another kind grown by Mr. Nicholson is short in the stalk—about four feet. He started it originally from a small quantity of the seed sent in a letter to him from India. The corn is better than that of the common kind, and it has two great advantages, firstly, storms which lay low the long kind, pass over it without doing injury; and, secondly, it is much easier to harvest—there are none of the neck and arm aches from working above the head. At the late Richmond Show, Mr. Nicholson took all the mabele prizes.

Mealies and Grubs.

"Until recently," said Mr. Nicholson, "we all thought safety from the grub could be found in late planting. Faith in that direction has now passed away. We now try to plant as early as possible, and sometimes the result is fortunate, but it is all a matter of chance. The dry Springs of late years are, of course, against early planting. A couple of years ago I had a ten-acre field which looked a perfect picture, and several neighbours remarked upon it, saying what a tremendous crop it would give. I went to have a look at it and was disillusioned. Every plant was riddled by grub. Grub in the mealies and grub in the mabele is one of the greatest curses from which we suffer. The yearly loss inflicted by this pest is enormous, and anyone who could show some practical way of dealing with it would be a benefactor indeed!

Blight.

"The blight which used to concern us a lot is now passing away. There is a curious thing about it which seems to escape general notice, and that is, that plants which may still be affected by it are not barren as formerly—they carry cobs."

Forage.

To get a rust-proof forage, Mr. Nicholson experimented considerably, and he believes he has succeeded. He tried eight specially recommended kinds. The one which with him remains proof, he imagines, may be the same as the "Mapstone." Mr. Mapstone, it may be remembered by those who read my "interview" with him, got the seed, so to say, accidentally, and at first was inclined to demand damages from the firm which supplied it for not sending seed according to order. Mr. Nicholson has good reason to be satisfied. Chance seed, for instance, among Algerian, which has rusted to the ground, have thrown up beautifully clean plants, absolutely free from rust.

Potatoes.

Mr. Nicholson finds the Early Rose and Up-to-dates the best potatoes for cultivating. His system of planting struck me as better than that commonly practised. The plough oxen do not walk in open furrows, and in consequence displace the seed, the furrows being closed over immediately, but without a diagram,

which is not here practicable, I cannot give a clear explanation. On the land under water, of his Doornkloof farm, the potato crop ripens in the first week of November. As a preventive of scab he sulphurs the seed potatoes. The seed is placed in barrels or boxes, and he puts sulphur on the top—which quickly works through the seed down to the bottom. When the seed is lying in the furrows, he throws a handful of fertiliser, reduced by ashes, rotted stable manure, or earth, on each set, and the advantage is considerable. A handful of ashes thrown on a set will make the bunch of potatoes when ripe leave the soil bright and clean. In the days of that good old potato, the "red rough," he used to get 100 muids to the acre: Messrs. Styles & Ledley on one occasion got 120 bags to the acre. He thinks a few "red roughs" are still grown in the Byrne district.

Buckwheat.

From September till April Mr. Nicholson puts in every month a two acre plot of this useful fodder. It is his great standby for pigs, and is first-class for poultry of which he has a large lot.

Pigs.

"I keep about 250 pigs. Yorkshire Whites are what I prefer. No, I don't like the Berkshires because they don't herd well. When there is grass my pigs are running out, and a boy can easily manage two or three hundred Yorkshire Whites on the veld, or in buckwheat. Yes, we spay the sows: it is common here now. I was the second to do it in this district. A friend, Mr. Harcourt, taught me. I now trust the operation to natives I have taught. The great thing is to stave the sows beforehand—if not, there will be losses. I don't trouble to make bacon now; selling by live weight at Durban pays better."

Manures.

"There is no all-round fertiliser to approach good farmyard manure, in my opinion, especially pig, of which I have always a large quantity. But chemical fertilisers are also good, and I am a fairly big user of them. 'Odams' Complete' I find very good, and it has this great advantage, that it is done up in half cwt. bags. Nearly all the other fertilisers are put into cwt. and even two cwt. bags, and the consequence is the sacks get damaged in transit, and quantities of the contents are lost. Then look at the loss in labour in getting the big bags on to your wagon, into your shed, on to the wagon again, and worst of all, is the handling them in the field. It is wonderful how unpractical the suppliers of farmers' wants are! At present I am using large quantities of aloe ash—the Thorns aloe; 'nhlaba,' as the Kafirs call it. I am sending a sample of it to the Agricultural Department, asking them for an analysis showing its manurial properties. When I receive it I will send a copy to the *Journal* for publication. I pay my Kafirs 1s. a sack for it, and they are bringing it in freely. As a top dressing for buckwheat it gives first-class results, and so far as my opinion goes now, I thing it is nearly equal, all round, to any of the fertilizers."

Cattle.

"I do not take particular interest in cattle. I consider this a fairly, but not extra good district for stock. All of us ought to avoid having summer calves, but somehow or other a good many of us do. I quite agree with what my neighbour, Mr. John Marwick, said in his interview with you on this subject. But the evil of summer calving is no new discovery. All the land about here used to belong to four brothers, named Uys. They used to say—'You can cut the throats of all calves dropped after November.' One of the younger brothers—now in the Legislative Council for Zululand — was my best friend as a boy. I have, like others, had my losses in cattle. In inoculation against Rinderpest I was very unfortunate owing to the beast we had bought for that purpose being diseased. Lightning on one occasion killed no fewer than 14 in a clump. That, I think, may be a record for cattle grazing in open country."

Ticks.

"Ticks are one of the greatest curses cattle breeders hereabouts have to contend against. It is a very strange fact that my Thorn farm Doornkloof is now practically free from them, and that they are bad up here. I am under the impression, and it is shared by many, that the plantations

account for the present prevalence. Ticks infest the vegetation not yearly burned. One day I told a Kafir lad, when I was burning round, to shove back some old grass in a plantation. After a minute or two he ran to me to show his arms. They were covered with myriads of minute ticks."

Forestry.

Mr. Nicholson has about 50 acres of tree plantations, and while going through them he remarked that it was a great pity people did not know more about the kinds to plant. He has some fine specimens of pinus insignis fifty to sixty feet high, but now, although only some 25 years old, they are beginning to rot. In this district, at any rate, the pinus insignis is a failure. The yearly rainfall, he thinks, is too small and of too short duration, considering the heat, and, as a rule, the shallowness of the soil. He thinks that the never-rotting sneezewood should be planted, also the white and black ironwood and stinkwood. He says that the common gumwood (*E. Globulus*) growing on his farm appears to be much tougher than that grown elsewhere, say at Richmond, where there is a great depth of soil. His gum posts are still perfectly sound, whereas posts from gum grown at Richmond have in less time tumbled over from rot. As an ornamental tree he speaks highly of the Imvumvu. It is nearly always in leaf; in spring the foliage is a beautiful light green, and in winter a remarkably dark green, is easily transplanted or grown from seed, and it stands considerable frost. It is fairly quick growing, and reaches a height of 30 or 40 feet. Mr. Nicholson grows bamboos, and, of course, finds infinite use for them. Near the house is a row of symmetrical oak trees, growing for the most part in nothing but shale. Originally they were young treees about four inches in diameter, all above the stem being cut off, and the same with the roots. They resembled just big clubs, and were put in as posts for a fence. It is not everybody, as Mr. Nicholson remarked, knows that young oaks can be so handled. Mr. Nicholson has several miles of Mauritius Thorn fence. When two or three years old the fence is impenetrable to man or beast, and if accidentally burned down, it has the merit of soon growing again into an effective state. But it is very big and spreads, and ruins the ground for fully twenty yards on either side. The extermination, however, is not difficult.

Native Medicines.

Mr. Nicholson is enthusiastic as to the properties of many of the native medicines, and he was good enough to press me to taste various drugs he had in stock.

"Mhlwazi," he said, "comes from the Tugela District, and is an infallible cure for cattle that get blown. It is marvellous; you see a beast swollen out like a balloon, and if you give a bit of this bark, say of the area of your little finger nail, ground up and mixed in hot water, the animal's sides, in a quarter of an hour, will just fall together. Kafirs use it if suffering from flatulence.

Mhlabelo is good for wounds in man or beast that are slow in healing. A piece is inserted in the flesh near the wound, and it acts as a seton.

Buchu leaves come from the Cape, and are steeped in any spirit. A little of the infusion is most healthful, especially when taken with gin, or *en zonen* as the liquor used to be called here in the prewhisky days.

Snake medicine is a wonderful cure. This small quantity (about a wine-glassful of coarse brown powder) cost me 10s. I got it from an old woman who will not, for any price, sell the secret. Kafirs from all about send to me for a dose of it when a snake bite occurs.

The Thorn Aloe is a most useful alterative and purge. With that plant, which need cost nothing, a man can defy fowl-sickness if he will follow my advice. Take a couple of large green leaves, bruise or pound them well; add 60lbs. of mabele, and enough water to soak all, and occasionally stir. Feed the mabele to the poultry, and repeat during the sickly season every fortnight, and the losses will be nil. For gallsickness I find it also a first-class remedy. Take a big leaf and pour on it equivalent to two wine bottles of boiling water. When cool give the liquor as a drench. I have, as you see, several of these aloes handy by the house. In transplanting, be careful to plant the top; the root end alone comes to nothing."

Field Mice.

"Sometimes the country swarms with field mice, and they will eat off all the grain from forage the first night after it has been cut. This is the way to stop that. Turn the butt ends of the forage to the standing forage, or the grass outside the field; it is a wrinkle worth knowing."

The Natives

There are probably but few, if any colonists, who know the native better than Mr. Willie Nicholson. "Year by year," he said, "Kafirs are growing worse and worse. Why? Well, the immediate cause is drink—Kafir beer. Disinclination to work, unreliability, utter laziness, and demoralization in every respect is the result. Even the women and children now drink, a thing that the men would not have tolerated even twenty years ago. How do I account for the laxity? The answer is simple—the growing disappearance of proper authority, the authority of the Chief, and that of the father. They can, and now do all that individually pleases them—practically independent of communal or family restraint, and the fact that mabele stands the drought much better than the mealie, account a great deal for the beer-drinking curse. Instead of extending my cultivation, I am drawing in, and solely on account of this curse. Are the local missionaries doing good? Yes, a lot of good in the way of getting them to dress properly, and cleanliness; but beer-drinking, polygamy, and witch-doctors are the great drawbacks to the missionaries' efforts. When the converts have made enough money, they for the most part go in for a second wife, and drop all notions of becoming industrious, one-wifed citizens. Among all Kafirs men of great intelligence can be found, and I have some who can do building and other work that would nearly pass muster as well as that of a town artisan, or trained white farm hand, but no reliance can be placed in the best of them. The attractions of beer outweigh altogether the fear of disobeying the master's orders. This quickly-growing demoralisation of the natives generally through the Colony, but more observable in some districts than others, is a really bad business."

And here, upon a subject much exercising Mr. Nicholson's mind at the present moment, I bring the interview to an end.

Veterinary Departmental Report for June, 1901.

ABSTRACTS FROM REPORTS.

Minister of Agriculture.

I HAVE the honour to forward herewith the reports for my department for the month of June, the chief item of interest being the occurrence of an outbreak of Rinderpest during the earlier part of the month in the Umvoti Location. You are already in possesssion of the facts concerning this outbreak and the measures adopted by the Department for its suppression; happily, these efforts have been attended with success, and the disease has been restricted to the spot at which it was originally discovered. No facts tending to clear up the question of the origin of the outbreak have come to light.

In this connection I understand that the Imperial Authorities intend establishing an extensive factory in the Transvaal for the production of large quantities of Rinderpest serum. This being the case, we shall for the future view with less apprehension the occurrence of outbreaks of Rinderpest, which has thus passed within a few years from a malignant and intractable disease to a malady of second rate importance, controllable as to its virulence and limited in its effects.

The report of the Veterinary Officer in Klip River County shows the continued existence of extensive outbreaks of disease. About fifty licenses have been issued for the suppression of lungsickness in this County alone within the month. The concluding paragraph in Mr. Hutchinson's report explains in a great measure this continued extension of disease, and while large numbers of stock continue to enter the Colony,

amongst which "it is almost impossible to find a clean herd or flock," so long we shall be unable to hope for any betterment of our condition in this respect.

You will see that fourteen animals have been prohibited from entering the Colony by reason of their being affected with the disease tuberculosis, and the fact should not be lost sight of amongst intending importers that the disease exists extensively amongst Madagascar cattle.

Work in the Laboratory during the month of June has not been great; about 600 doses of quarter-evil vaccine, 10 doses mallein, 10 doses of anti-streptococcus serum, and 4 doses of anti-venenne have been issued in addition to the ordinary work of the Laboratory, such as examinations of *post-mortem* specimens, inoculations of immune animals, etc., etc. Besides the extra work entailed by the recent outbreak of Rinderpest, the amount of official work has been great, leaving but small time for research work, etc.

I have the honour to be,
Sir,
Your obedient Servant,

H. WATKINS-PITCHFORD,
C.V. Surgeon.

MARITZBURG.—D.V.S. WOOLLATT.

The greater part of the month I was in the Umvoti Location on Rinderpest duty (from 11th to 25th); the rest of the time I have been occupied with office work and the duties of D.V.S., Maritzburg.

During the month 259 oxen have been admitted to the clean quarantine depôt at Pieters, and 490 oxen discharged and allowed to come south of the Tugela River.

The Government Grazing Area for discharged transport oxen at Elands Laagte was given up on the 10th, and a new area formed on the Crown lands at Umhlamyl During the month 1561 oxen have been running on this new area; two cases of lungsickness appeared on the area during the month. Both of the affected animals, however, died of the disease, and on July 1st the area was free from lungsickness. Eight deaths from other causes happened in June, five from poverty, and three from accidents (falling down mountains, etc.)

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—Fourteen licenses have been issued during the month in the Newcastle Division, but against this 40 quarantines have been raised. Twenty-five fresh outbreaks have been reported in Ladysmith Division, and seven quarantines raised. Also ten outbreaks in Dundee Division and two in Upper Tugela, with two licenses raised. There are seventy head of cattle affected with the disease in the Lennoxton Camp, and about a similar number in the Camp on Decker's farm. Thirty-two infected oxen remain behind at Matowan's Kop, Elands Laagte, and there are 1,561 discharged transport oxen in the Camp at Mhlumayo.

Scab.—Thirteen flocks have been placed under license in the Newcastle Division, and eighteen quarantines raised for this disease. Ladysmith, three issued and two removed. Upper Tugela, two issued and one removed. In Dundee twelve flocks have been licensed.

48,288 sheep have entered the Colony during the month, *via* Charlestown, over 14,000 of which were dipped at the Coldstream Dipping Station.

The majority of the flocks and herds placed under license are recent arrivals in the Colony.

A large amount of stock still continues to enter the Colony from the O.R. Colony and Transvaal, amongst which lungsickness and scab are rampant, it being almost impossible to find a clean herd or flock.

GREYTOWN,—D.V.S. CORDY.

Scab.—Three outbreaks have occurred during the month.

Lungsickness.—No fresh outbreaks. The cattle of Mr. E. Boast, of York, have been placed under a second license from June 14th, one animal having died on that date. No others are showing symptoms of the disease at present.

Rinderpest.—An outbreak of this disease occurred during the month at the kraal of Native Mbogodo, in Sobuza's Location, Umvoti Valley, among a troop of twenty-one head of cattle, three of which had been lobola'd to Native Ngwadhla at a neighbouring kraal, and there died.

You, of course, are in possession of full particulars of the outbreak from personal inspection.

I took over charge of the quarantine area from D.V.S. Woollatt on the 23rd of the month.

General.—A few cases of gallsickness were reported from different parts of the District, and cases of quarter-evil were reported from the Western Umvoti Division.

In the early part of the month I visited Eshowe, Zululand, to investigate a supposed outbreak of glanders, but fortunately it proved to be a disease of a much less serious nature. A special report was furnished to you on the matter.

IXOPO.—D.V.S. VERNEY.

Sheep Scab.—This disease is more prevalent than I would like to see.

Lungsickness.—No fresh outbreak of this disease has occurred. The herds under license are progressing satisfactorily.

Redwater.—There has been a considerable amount of this disease in the Ixopo Division this month. A number of cattle coming from Endowana to the Ixopo developed redwater. Treatment was fairly successful in those animals that were treated at the onset of the disease.

An imported Shorthorn bull has again been very ill. This animal showed every symptom of redwater except the actually discoloured urine. The remarkable feature of this illness was the extraordinary high temperature recorded. For eighty hours the temperature ranged between 105F and 108·4F. For seven consecutive hours the temperature ranged from 108 to 108·4. The animal registering such a high temperature I quite thought the case would prove to be fatal. But such was not the case, and the animal is now doing well. This is the fifth time the bull has been seriously ill.

MOOI RIVER.—D.V.S. WEBB.

Lungsickness.—This disease appears to be making no progress in Weenen County.

Scab.—As was anticipated, this disease is prevalent owing to its extensive importation into the County.

During the month I have attended two imported Devon bulls and one Shorthorn for severe digestive troubles. They have all three made complete recoveries. Other cases treated have been :—Eversion of the uterus in a Devon cow ; fistulous withers in an Australian mare ; ventral hernia in a Shorthorn cow ; chronic mastitus in a cow ; lacerated shoulder in a gelding, caused by a poke from a bull's horn ; ulcerative stomatitis, followed by purpura ; corns in a polo pony ; strangles ; castration, etc.

HOWICK.—D.V.S. BYRNE.

Scab.—None.

Lungsickness.—Three cases. Five herds under license have been declared clean during the month.

LION'S RIVER.

Scab.—Two first licenses have been issued and one second.

There is no other disease of a contagious nature in this Division.

I received a wire one afternoon from Mr. G. Teasdale to visit a cow which could not calve.

On arrival that evening, Mr. Teasdale informed me this cow was due to calve in a few days, but had been poked in the flank by another cow, which caused a nasty puncture wound, and brought on labour pains, which, however, did not induce labour.

On examination per vaginam I found the head of the calf presenting, but both forelegs were down in the "calf-bed," and as the cow had been in this condition for over twelve hours, of course the neck of the womb had constricted on that of the calf. The calf, I need hardly add, was dead. It was impossible to shove the head back, so the only alternative was to amputate the calf's head and return the carcase to the womb, then secure both forelegs and deliver in the ordinary way.

This was done by cutting into the head and removing the bones piece by piece, and some of those of the neck. After returning the carcase, both forelegs were brought into the passage and secured.

The cow, of course, by this time was prostrate, so we went to the house to get a stimulating drench and some sacks to cover her, as it was a bitterly cold night, the coldest I have felt this season, but when we returned the cow was up and feeding, so we drove her to the shelter of a haystack, as she was out in the open, gave her the drench, and put the sacks on. The after-treatment was antiseptic

vaginal injections, and antiseptics for the wound.

This, I think, would have been a most successful case, but, unfortunately, inflammation of the peritonium set in, the result of the wound from the poke in the flank, which extended to the uterus, and ended in the death of our patient.

DURBAN—D.V.S. AMOS,

Glanders.—One case showing clinical symptoms of the disease was found in the stables of the Colonial Carrying Company. I destroyed the horse, and made a *post-mortem.* The lesions of the disease were extensive in both lungs. The remaining horses were inspected, but none showed aay clinical symptoms. They have since been tested, and the stable is undergoing disinfection and structural alterations.

Two condemned stables in Brickhill Road have undergone a complete alteration and disinfection under my own snpervision and to my satisfaction, and are now being used as stabling.

The condemned stable in Commercial Road has now been demolished by the owner, who is erecting store rooms upon the site.

There only remains now one condemned stable in Durban.

The plan of Durban to show such places I am in hopes of getting from the Public Works Department here.

Tuberculosis.—During the month fourteen head of cattle have reacted to tuberculin, all of which have been reshipped. Thirteen of these were out of one batch of Madagascar oxen.

Horsesickness has abated now.

Lungsickness.—The dairy of Mr. Caldwell, Stamford Hill, is still under quarantine. Ten bulls arrived from Australia in transit to Beira. One fell sick whilst here, and developed a suppurative pleurisy. On *post-mortem* examination the pleura was found to be generally thickened (about $\frac{1}{2}$ inch in thickness), and coated with inspissated pus, the pleural cavity being full of a thin suppurative fluid.

I have had one good recovery from a joint infection by an organism of a necrotic character common to the eastern vlei. The animal was cast and the whole joint thoroughly disinfected. I then inserted four deep setons, and applied a mercurial ointment twice daily. Under potassium iodine treatment, the animal is steadily improving.

Some Manure Experiments.

THE annual reports of the Canadian Experimental Farms for 1900 contain a mass of information concerning the use of fertilisers for cereals, a few notices of which will be instructive to our cultivators, notwithstanding the different climatic conditions. At the Ottawa Farm these experiments have been carried on for twelve years, the land used being a sandy loam more or less mixed with clay, which was originally covered with heavy timber. As a result of these trials it has been shown that barnyard manure (mixed horse and cow manure) can be most economically used in the fresh or unrotted condition. Ton for ton its producing power appears equal to rotted manure, which loses during the rotting about 60 per cent. of its weight. At the time the experiments were started it was the general opinion that finely-ground untreated rock phosphate was a valuable fertiliser, but ten years' experience showed that unless treated with sulphuric acid it was of no value as a fertiliser. These conclusions, however, are different to those arrived at in connection with experiments elsewhere, and it would appear to have some distinct value in soil well supplied with humus. The use of sulphate of iron has proved to be almost useless for producing an increased crop, though highly recommended at one time by a high authority. Common salt has been shown to be a most valuable agent for producing an increased crop of barley, and of much less value for spring wheat or oats. Gypsum has similarly proved of use on barley crops, but of little value for wheat or oats.

After constant cropping for ten or eleven years, it was found that the soil in the plots receiving no farmyard manure were much depleted of humus, and hence less capable of holding moisture, and, apart from the question of plant food, less favourable for the growth of plants. To

rectify this various green crops were sown and ploughed under, and other treatment given to restore the humus.

Another question being tested was the length of time liberal applications of barn-yard manure on the soil would continue to affect the subsequent crops put in without manure. Nothing definite on this point is yet determined, as only two crops have been grown since. The use of mineral super. alone, at rate of 500lb. per acre, does not appear to have a marked effect on wheat; but contrary to what might be expected, the continued application year after year of an incomplete fertiliser like super. does not appear to have resulted in smaller returns. The average yield of this plot for the first ten years was 11 bushels, 48 5/10lb. per acre; for the thirteenth year (the second crop put in without additional mapure), the yield was 11 bushels 55lb. per acre. Another plot receiving the same treatment shows the same general results, but the returns are somewhat better, the ten years' average being 12 bushels 33 8/10lb., and the thirteenth crop 14 bushels 40lb. The average for thirteen years of the two plots manured with super. is only 2 bushels above the average of the two unmanured plots. In the tests with oats and barley the results have been somewhat similar, though the yields all round are higher, and the super. has been more profitable. With the returns from oats the extra yield averaged about 9 bushels, and with barley about 6 bushels, more per acre than the average of the unmanured plots.

Right through the whole series of experiments the application of 15 tons per acre of farmyard manure has given the best return.

Mr. Tom Hall's Devons.

THE above is a picture of some of Mr. T. W. J. Hall's Devons. The troop is now getting pure-bred, nearly all being of the fourth or fifth strain, and after the sixth a herd is considered to be pure-bred. Several attempts were made to get the cow with the uncharacteristic white markings—one of the exceptions—to take up a less obtrusive position, but she was not to be thwarted. For a full account of Mr. Hall's troop and for his views on cattle management see No. 1, Vol. IV.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inandwa & Ndwedwe	Lungsickness	Grichie ...	Newlands.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		"	F. R. Moor ...	Greystone.
		"	Cooke & Co. ...	Blue Krantz.
		"	F. Bloy ...	Monte Christo
		"	J. G. Maritz ...	Vi Plaats.
		"	Jas. Ralfe ...	Frere.
		"	F. Knapp ...	Klipfontein.
		"	G. M. Rudolph ...	Spitzburg.
		"	J. W. Moor ...	Moorleigh.
		"	E. A. Drier ...	Vaarkinsfontein.
		"	Nqatabaan ...	Moord Spruit.
		"	J. Oates ...	Oatsvale.
		"	P. J. Bester ...	Rensburg Spruit.
		"	R. C. O'Neil ...	Hillgrove.
		"	C. J. Labuscagne...	Haatsfontein.
		"	S. Nel ...	Wagon Drift.
J. Button ...	Estcourt, South of Bushman's River	"	C. Cope	The Hoek.
		"	J. Mattison ...	Klip Stone.
		"	C. B. Lloyd ...	Hidcote.
		"	Mrs Lindsay ..	Rosebank.
		"	W. J. Dickens ...	Derby.
		"	Geo. Gibson ...	Craignevin.
		"	S. C. Boshoff ...	Waterhoek.
		"	L. Shomann ...	Twyfelfontein.
		"	S. Shomann ...	Willow Grange.
A. H. Ball ..	Weenen ...	"	C. Van Rooyen & J. S. Els	Scottsberg.
		"	W. Lotter ...	Doornkloof.
		"	P Van Rooyen ...	Middleburg.
		Lungsickness	Mgina... ...	Location
J J. Hodson ...	Lion's River ...	Scab	A. C. Thomson ...	Fort Nottingham.
		"	W. Taylor ...	Fordoun.
		"	W. T. Shaw ...	Shawswood.
		"	W. Pepworth ...	Bolesworth.
		"	Mrs F. McKenzie	Onverwacht.
		"	W. L. Methley ...	Newstead.
		"	S. Nurden ...	Wood Farm.
		"	F. Curry ...	Weltevreden.
		"	Geo. Woodhouse	Halliwell.
		"	M. A. Sutton ...	Thorney.
E. J. B. Hosking ...	Upper Umkomanzi	"	W. Nicholson ...	Beaulieu.
		"	H. Hosking ..	Trewirgie.
		"	F. Nicholson ...	Alton.
R. J. Raw ...	Impendhle ...	"	C. P. Spiers ...	Mount Park.
		"	Sobuqu, Verta & Pinda	Natal Land & Colonisation Co's farms.
			Nozulela ...	Nooitgedacht.
		"	T. Fleming ...	Good Hope.
		"	J. W. Brooke ...	Impendhle Store.
		"	G. Renyard ...	Hamilton Hall.
		"	A. C. Crosse ...	Dingley Dell.
		Lungsickness	C. C. Lewis, and Native ...	Clairmont.
W. Wilson ...	Polela	"	Miller, Bros. ...	Fairacres
		Scab	A. W. Leggatt ...	Selbourne.
		"	J. Hayes ...	Glengariffe.
		"	H. Pennefather ...	Home Rule.
		"	R. Nicholson ...	Lowlands.
		"	R. C. Gold ...	Woodend.
C. E. Hancock ...	Ixopo ...	"	R. Kennedy ...	Cornhill.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
C. E. Hancock ...	Ixopo ...	Scab	A. Watson ..	Rosehill.
		,,	W. Gray ...	Helmsley.
		,,	Natives ...	Langefontein.
		,,	J. Dalgarno ...	Abercairney.
		,,	A. Stone	Craigie Lee.
		,,	W. W. Walton ...	Dronk Vlei.
		,,	P. J. Webb ...	Crystal Manor.
		,,	L. Howes .	Mornington.
		,,	G. Thompson ...	Cromwell.
		,,	J. Anderson .	Littledale.
J. F. Bernard ..	Newcastle	Lungsickness	J. Mortimer ...	Try Again.
		,,	P. W. Dept. ...	Newcastle T'Lands
		,,	G. E. Jubber ...	Brackfontein.
		,,	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		,,	A. Paine ...	Mount Prospect
		,,	Natives ...	Droog Plaats.
		,,	G. W. Nourse ...	Ruth.
		,,	Simeon Ndhlovu	Freda.
		,,	O. Olver ...	Newcastle T'Lands.
		,,	G. W. White .	Ruth.
		,,	C. R. Savory ...	Pomeroy and Evin.
		,,	Blizzard & Pratt	Ingogo.
		,,	J. W A. Welsh ...	Paradise.
		,,	G. Wood ...	Heron's Court.
		,,	A. F. Henderson...	Brazil.
		,,	A. J. Crawford and Natives ...	Diamond.
		,,	Natives ...	Milton.
		,	Lowrens and Van der Merwe ...	Buffalo River.
		,,	H. Fick ...	Northdown.
		,,	H. Austin ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	Natives ...	Elizabeth Dale.
		,	J. Masangu ...	Pernambuco.
		,,	Funwayo ...	Tiger Kloof.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	G. W. Nourse ...	Glen Harte & De Weistroom.
		,,	W. Steele ...	Tweefontein.
		,	— James ...	Newcastle.
		,,	Umketega ...	Vrede.
		,	Bonombi ...	Heron's Court.
		,,	F. Stevens ...	Newcastle.
		,,	A. J. Hurd ...	Tweefontein.
		,,	G. J. Way (Derelict Stock) ...	Vrede.
		,	Mtshabane ...	Reserve.
		,,	Mahakan ...	Kilbarchan.
		,,	Johannes ...	The Reserve.
		,,	Umbetta ...	Freda.
		,,	R. Morrison ...	Newcastle.
		,,	Maling & Sibibi...	Blauwboshlaagte.
		,,	Umgubani & Mahlogozulu ..	Hope Farm.
		,,	S. W. Reynolds ...	Ramsgate.
		,,	Mangweni ...	Hope.
		,,	W. Uquhart ...	Laureston.
		,,	Jack Unguni ...	Blauboshlaagti.
		,,	Umpegelele ...	Kilbarcean.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	A. J. Crawford ...	Newcastle.
		,,	W. Adendorff ...	Sanford.
		,,	S. W. Reynolds ...	Minster.
		,,	Umgodini & Kumalo	Greenwich.
		,,	H. Meineke ...	Ruston.
		,,	Umbobojan ...	Valsefontein.
		,,	Mrs. H C. Shorter and Sambana ...	Spectacle Spruit.
		,,	J. T. Grant ...	Rooi Pont.
		,,	C. Jackson ...	Yarl.
		,,	H. C. Dicks ...	Minster.
		,,	T. Ferrier ...	Henley.
		,,	Sekonyana ...	Rooi Poort.
		,,	McMurray & Hurd	Greenwich.
		,,	J. Surtees ...	Newcastle.
		,,	Tinta ...	Ballengeiches.
		,,	Verasamy ...	Newcastle.
		,,	Tunziane ...	Blauwboshlaagte.
		,,	W. G. Moss ...	Mossdale.
		,,	J. R. Watt ...	Main's Camp and Bothadale.
		Scab	G. J. Way ...	Vrede.
		,,	G. Star ...	Lennoxton.
		,,	R. S. Miller ...	Goloch.
		,,	C. G. Palmer ...	Dry Cut.
		,,	J. Davidson ...	Lennoxton.
		,,	A. J. Debenham ...	Knowsley.
		,,	G. Wood ...	Heron's Court.
		,,	A. D. Uys ...	Horn River and Mooi Krantz.
		,,	T. Ferrier ...	Henley.
		,,	G. Jackson ...	Try Again.
		,,	W. Richards ...	Tweefontein.
		,,	W. E. Few ...	Erin & Imbezana.
		,,	Blizzard ...	Ingogo.
		,,	W. Short ...	Potter's Hill.
		,,	J. Matthews ...	Shakespeare.
		,,	G. Brown ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	R. S. Armitage ...	Boschhoek.
		,,	H. P. Beare ...	Harte River.
		,,	— Wood ...	,,
		,,	Jim Smith ...	Lennoxton.
		,,	S. W. Reynolds ...	Minster & Ramsgate
		,,	N. H. Fick ...	Wykom.
		,,	A. Vanderplank ...	Eagle's Cliff.
		,,	W. Nicholson ...	Rooi Poort.
		,,	M. C. Behr ...	Shuttleworth.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	Anea & Latcham	Plessis Laager.
		,,	W. Oldfield ...	Ambleton.
		,,	Jonas ...	Slangspruit.
		Scab	Dickinson Bros. ...	Braeburn.
		,,	Ulukozana ...	Bishopstowe.
J. Chaplin ...	Klip River ...	Lungsickness	A. H. Spring ...	Reserve.
		,,	A. Armstrong ...	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ...	Grobblar's Kloof.
		,,	Natives ...	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Lungsickness	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	Pepworth & Reid	Reitfontein
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein
		,,	J. Van Whye ...	Ladysmith T'Lands
		,,	G. J. Heslop ...	,,
		,,	H. E. K. Anderson	Gedula.
		,,	E. F. Gibbens ...	Plaat Berg.
		,,	G. F. & J. Woodhouse	Davel's Hoek.
		,,	Natives ...	Georgina.
		,,	G. J. McDuling ...	Waterford.
		,,	Natives ...	Langverwacht.
		,,	,,	Vertrek.
		,,	Nondo Gama ...	F. J. Dewaals' farm
		,,	A. Boers, & Native	Marais Vel.
		,,	W. Neizel, & Natives	Roosboom.
		,,	Natives ...	Doornkraal.
		,,	E. Walker ...	Doornkloof.
		,,	J. Umpbleby ...	Springfield.
		,,	F. N. Nel ...	Catherine.
		,,	Natives ...	Macpherson'a farm.
		,,	P. Ruiter ...	Ladysmitb.
		,,	Mdhlondhlo ...	Blaaubank.
		,,	Jobisa ...	Lombard's Kop.
		,,	Nosubala ...	Weltervreden.
		,,	H. E. K. Anderson and others ...	Dewdrop.
			Nondabola ...	Zwaart Kop & Dew Drop.
		,,	— Sandals ...	Home Farm.
		,,	B. G. Zietsman ...	Bosberg.
		,,	Natives	Roodepoort.
		,,	W. Cochrane ...	S. Wiltshire's farm.
		,,	J. de Jongh & Natives ...	Potini Spruit.
		,,	Natives ...	Reit Kuil.
		,,	A. S. McHattie ...	Wessel's Nek.
		,,	Cory & Long ...	Ladysmith T'Lands
		,,	Henderson ...	Weltervreden & Paarde Vort.
		,,	Scomber ...	Kleinfontein.
		,,	G. Robinson ...	Little Masara.
		,,	Natives ...	Dreifontein.
		,,	J. Farquhar ...	Stuarts Park.
		,,	Malela ...	Reit Kuil.
		,,	P. W. Dept. ...	L. Smith Tn. Lds.
		,,	Myanga Tigalala...	Umhlumayo.
		,,	A Henderson ...	Nelthorpe.
		Scab	J H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson ...	Walker's Hoek.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	E. F. Gibbens ...	Plaat Berg.
		,,	G. Wetherill ...	Walker's Hoek.
		,,	A. Krogman ...	Brakfontein.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Scab	M. W. Krogman...	Dreifontein.
		,,	P. Marais ...	,,
		,,	H. Boers ...	Dew Drop.
		,,	G. Spearman ...	Feir View.
		,,	J. Van Reenen ...	Wessel's Nek.
		,,	A. Boers ...	Marais Vel.
		,,	A. Carbutt & J. Good	Matiwaan's Hoek.
		,,	Sparks Bros. ...	Ladysmith.
		,,	J. de-Waal ...	Blaubank.
		,,	F. J. de-Waal ..	Lombard's Kop.
		,,	G. Innes ...	Eland's Laagte.
		,,	J. Umpleby ...	Springfield.
		,,	A. J. Taylor ...	Arnot Hill.
		,,	R. Horsley ...	Warrock.
		,,	Dr. Helps ...	Roosboom.
		,,	Corrigel ...	Koolfontein.
		,,	Cockrane & Illing	Dansekraal.
		,,	H. S. Bowers ...	Zaaifontein.
		,,	A. Henderson ...	,,
		,,	A. Henderson ...	Eenvogle Vlei & Elandslaagte.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	H. F. Pearson ...	Everton.
		,,	Natives ...	Unini Location.
		,,	R. H. Stainbank...	Stainford Hill.
W. Freer ...	Upper Tugela ..	,,	Borbasee ...	Vrom Draai.
		,,	S. Sharratt ...	Klein Waterfall.
		,,	Natives ...	Green Point.
		,,	A. H. Coventry ...	Earthcote
		,,	Mdhlenjana ...	Mooi Hoek.
J. R. Cooper ...	Nqutu & Nkandhla Districts, Zululand	,,	A. Barklie ...	Nqutu Hill, Nqutu District.
		,,	Piet Gobese ...	Mangongoloza Hill, ,
		,,	Natives ...	Mkonjana, ,,
		,,	,,	Telezi Hill, ,,
		,,	,,	Nqutu Hill, ,,
		,,	,,	Macebo Hill, ,,
		,,	,,	On Buffalo River, ,,
		,	C. Johnstone ..	St. Augustines, ,,
		,,	Natives .	,, ,,
		,,	,,	Rorke's Drift, ,,
		,	E. P. Vant ...	Vant's Drift, ,,
		,,	Natives ..	,, ,,
		,,	,, ...	Segweni, ,,
		,,	Umasesa ...	Hlati Spruit, ,,
		,,	Natives	Mangeni, ,,
		,,	H. Fry ...	Mpandhleni, Nkandhla District.
		,,	P. Zietsman ...	Near Umhlatuzi, ,,
		,,	Natives ...	,, ,,
		,,	Hutchinson and Hyslop	Near Magistracy, ,,
		,	Struben, Bottomley & Loxton	Upper Umfongosi, ,,
		,,	,,	Middle ,,
		,,	,,	Lower ,, ,,
		,,	J. Vanderwesthuisen	Qudeni Hill, ,,
		,,	H. Swanfield ...	Near Inzuzi, ,,
		,,	Schonyana ...	Qudeni, ,,
		,,	J. R. Nel & Van Rooyen	Babanangu ,,
		,,		Ndule's Location, ,,

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District,	Disease.	Owner.	Farm.
G. Gielink ...	Eshowe. ...	Lungsickness	Sibobile ...	Matikulu, Eshowe District.
	Entonjaneni, and Umfo'osi Districts, Zululand.	,,	Umhlukwana ...	Umsunduzi, ,,
		,,	A. Garland, ...	Bond's Drift, ,,
		,,	G. Higgs & Co. ...	Umhlatuzi, ,,
		,,	P. W. Labuscagne	,, ,,
		,,	F. McGuire ...	,, ,,
		,,	L. Schultz ...	Near Eshowe. ,,
		,,	Luigie ...	Umfuli, Entonjaneni District.
		,,	W. Calvery ...	Wansbeck. ,,
		,,	L. Kritzinger ...	Osborn. ,,
		,,	R. J. Ortlepp ...	Merino, ,,
		,,	J. Fry ...	Empepala, Eshowe ,,
		,,	James Umtembu	Entumeni, ,, ,,
		,,	J. R. White ...	Schuithoek, Entonjaneni District.
		,,	P. Pretorious ...	St. Andrews, M.S., Eshowe District.
		,,	Liversage and Van Rooyen	Umhlatuzi, Eshowe District.
		,,	Military Cattle ...	Eshowe, ,,
		,,	Butze ...	,, ,,
		,,	H. S. Delauge ...	Umhlatuzi ,,
		,,	Volker, Schultz, F. Stockholm	Port Durnford ,,
		,,	P. W. Dept. ...	Eshowe ,,
		,,	P. Nel ...	Umhlatuzi ,,
		,,	B. and F. Green ...	Inyoni ,,
		,,	W. Magee ...	Umlalazi ,,
		,,	Arnold, Rorck and Magee	,, ,
		,,	— Corbett ...	Amatikulu ,,
		,	J. Henwood ..	Inyoni ,,
		,,	F. Green ...	Ungeye ,,
		,,	G. Müller ...	Duikerhoek, Entonjaneni District.
		,,	F. Buys ...	Barneveld ,,
		,,	Damusa ...	Kemp's Farm, Melmoth ,,
		,,	H. T. James ...	Prospect ,,
		,,	F. A. Ortlepp ...	Saxony ,,
		,,	T. Smith ...	Oakdale ,,
		,,	J. A. Ortlepp ...	Vlakbult ,,
		,,	J. R. White ...	Elizabeth ,,
		,,	T. Cooper ...	,, ,,
		Scab.	R. J. Ortlepp ...	Merino ,,
		,,	W Pretorius ...	Wansbeck.
Vacant	Portion of Zululand	Lungsickness	Dinizulu ...	Hlabisa District.
	North of White Umfolozi and	,,	Surrendered Boers	,,
		,,	C. Wheelwright ...	Nkonjeni, Mahlabatini District.
	Umfolozi Rivers	,,	— Van Rooyen ...	,, ,,
		,,	E. Loffler ...	Bulwana, ,,
		,,	Magojala ...	,, ,,
A. Klingenberg ...	Umsinga ...	,,	Umbambo ...	Stone Hill.
		,,	Ulunglala ...	Buffalo River Location.
		,,	Mrs. H. Strydom...	Uithoek.
		,,	Ngobazane ...	Vermaak s Kraal
		,,	Usiquantjee ...	Emsita.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. Klingenberg ...	Umsinga ...	Lungsickness	A. Müller ...	Pression and Buffalo Home.
		,,	H. Dedekind ...	Buffalo Home.
		,,	M. Shebele ...	Freiburg.
		,,	Dr. J. Dalzell ...	Gordon Memorial M.S.
		,,	H Stegen & Natives	Craigneathen.
		,,	T. Keyter	Pomeroy Town Lands.
		,,	T. Crooks	
		,,	Botha	
		,,	Westbrook Bros.	
		,,	N. Smit ...	Tugela Ferry
		,,	J. Benecke ...	Stone Hill.
		,,	Nqala ...	Location.
		,,	C. P. K. Vrey ...	Kalkfontein.
		,,	Ungangaza ...	Pression.
		,,	E. V. L. DuBois ...	Vergelugen.
A. J. Marshall ..	Dundee ...	,,	Marshall Bros. ...	Cleveland.
		,,	J. Landman ...	Boschfontein.
		,,	Natives ...	Renier.
		,,	A. Jansen ...	Sheepridge.
		,,	Natives ...	Navigation Colliery.
		,,	F. Payne ...	Glencoe.
		,,	N. Glutz ...	Swiss Valley.
		,,	J. W. Dupreez ...	Jackalsfontein.
		,,	C. F. Van Rooyen	Davelsberg.
		,,	Lyle & Sangster...	Dundee.
		,,	Charley ...	Woodlands.
		,,	Umzagaza ..	Morgenstont.
		,,	H. J. Harris ...	Sterkstroom.
		,,	D Neumann ..	Waterfall.
		,,	Natives ...	Weltervreda.
		,,	Paper ...	Smithfield.
		,,	S. N. Robins ...	Dundee.
		,,	N. Glutz ..	Morgenstont.
		,,	Natives ...	Maybole
		,,	Umonto ...	Crown Lands, near Dundee.
		,,	J. F. Johnson ...	De waar's Nek.
		Scab	A. Jansen ...	Sheepridge.
		,,	J. H. Erkland ...	Carolina.
		,,	F. J. deWaal ..	,,
		,,	J. H. Reis ...	Longfontein.
		,,	J. W. Dupreez ...	Jackalsfontein
		,,	D. Opperman ...	Gedull No. 2.
		,,	M. J. Herbert ...	Vermaak's Kraal.
		,,	H. J. Hearn ...	Hatting Spruit.
		,,	Gouws Bros. ...	Kelvin & Kilburne.
		,,	N. Glutz ...	Swiss Valley.
		,,	C. F. Van Rooyen	Davelsberg.
		,,	Maritz & Thornhill	Aletta.
		,,	W. V. Marshall ...	East Lynne.
		,,	P. J. Gouws ...	Uitflucht.
		,,	H. Harris ...	Sterkstroom.
		,,	Murray & Co. ...	Navigation Collieries
		,,	J. J. Uys ...	Verdenk.
		,,	P. H. Swart ...	Hartebeestefontein.
		,,	B. J. Nel ..	Blinkwater & Evansdale
		,,	A. G. Vincent ...	Craigieburn.
		,,	D. Meumann ..	Waterfall.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK - (*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ...	Dundee ...	Scab	Turnbull & Co. ...	Washbank.
		,,	Peerbhoy ...	Dundee.
		,,	H. J. Hearn ...	Double Kraal.
		,,	Thos. Dewaar ...	Navigation.
		,,	A. B. Daniel ...	Beith.
		,,	H. Kriel ...	,,
		,,	F. Kolbe ...	Langfontein & Staat.
		,,	G. Colbe ...	Zwaartwater & Rest.
		,,	R. J. Marshall ...	Cleveland.
W. A. Hutchinson	Alfred ...	,,	G. F. Ferreira ...	Hyle.
		,,	W. Stafford ...	Sutherland.
		,,	Nqubu ...	Location.
		,,	Ngihla ...	St. Mary's.
		,,	Makubana ...	Amaci Location.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	Natives ...	Hungerspoort.
		,,	A. P. Vandermerwe	Poortje.
		Scab	A. J. Harding ...	Zwart Kop.
		,,	J. Dryer ...	Culfergie.
		,,	C. C. J. Beeter ...	Brand Kraal.
E. Varty ...	Umvoti—Western Portion	,,	J. M. Wales ...	Farleigh.
		,,	A. M. Hofmeyer...	Emandhlim.
G. N. Perfect ...	Umvoti—Eastern Portion	,,	G. T. Van Rooyen	Daas Klip.
		,,	Thos. Hill ...	Stolzenvels.
F. E. Van Rooyen...	Kranzkop ...	,,	L. J. Potgieter ...	Broedershoek.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	— Thompson ...	Marburg.

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand have been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
28th August 1901.

M. J. HIME,
for P. V. Surgeon.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc: 37, 1900. For the month of July, 1901.

Date.	Description.	Quantity.	Imported from.	Ship.	Remarks.
1901.					
July 3	Potatoes	455 Bags	Melbourne	Bungaree	Free of Pest.
,, ,,	Potatoes	896 Cases	,,	,,	,, ,,
,, ,,	Apples	950 ,,	,,	,,	,, ,,
,, 8	Potatoes	200 ,,	,,	Salamis	,, ,,
,, 10	Ornamental Plants	1 ,,	Uitenhage	Pembroke Castle	
,, ,,	Apricot & Pear Trees ...	6 bales, 2,000 plants	Melbourne	Salamis	,, ,,
,, ,,	Apples	49 Cases	,,	,,	,, ,,
,, ,,	Potatoes	155 ,,	Hobson Bay	Vinebranch	,, ,,
,, ,,	Apples	950 ,,	,,	,,	,, ,,
,, ,,	Apricots & Peaches (sulp.)	46 ,,	Melbourne	,,	,, ,,
,, ,,	Apples	515 ,,	,,	,,	,, ,,
,, ,,	Potatoes	1,672 ,,	,,	,,	,, ,,
,, 20	Quince & Fig Trees... ...	2 ,,	Uitenhage	Guelph	,, ,,
,, 22	Potatoes	1,047 ,,	Wellington, N.Z.	Indramayo	,, ,,
,, 30	Apples	450 ,,	Melbourne	Aberdeen	
,, ,,	Seed Potatoes	275 bags	,,	,,	,, ,,
,, ,,	Potatoes	2,133 cases	,,	,,	,, ,,
,, ,,	Palms	2 ,,	Calcutta	Umbilo	,, ,,
,, ,,	Fruit Trees	2 bales	Uitenhage	Guelph	,, ,,

C. B. JONES, Examining Officer, Agricultural Department.

Correspondence.

To the Editor Agricultural Journal.

A MEALIE SPORT.

DEAR SIR,—The above drawing is taken from a mealie plant handed to me by Mr. G. T. Colenbrander, of New Guelderland. It was observed by him growing in his mealie crop, and the peculiarity of its development induced him to send it on as being probably a specimen of some interest.

The spike—which in a normal plant carries the plume-like male inflorescence terminally—in this case was accompanied by the female spike, both growing together at the top of the stem, instead of the male terminally, and the seed-bearing spike auxiliary below; the mealie cob sprung with the plume, the two kinds of inflorescence, staminate and pistillate, arising from the same point, the base of the cob spike being, if anything, terminal to that of the plume. Another noteworthy feature was the absence of any sheath or covering to the cob The mealie seeds were quite bare and exposed, and had not the slightest pretence to a sheath. The cob itself was rather small, but the seed rows were fairly regular, except in one or two places where they were undeveloped.

The peculiar misplacement of the reproductive parts is evidently due to a freak of nature, a diversion from the normal development which is hard to account for, due probably to some physiological cause whereby a disturbance of the tissues has led to a slight disorganisation of the system.

I do not know if there is any great advantage pertaining to a selection of seed which will return unsheathed cobs; in fact, this may prove a disadvantage in many ways, and from the appearance of the specimen the terminal setting does not seem to be so strong as that arising lower down, where the cob has the support of a strong stem to maintain its weight; but, as a matter of interest, Mr Medley Wood has kindly consented to rear the seed next season, so that it may be ascertained whether the variety will be perpetuated through them or revert to the original type.

ALEX. PARDY, F.C.S., &c.,
Agricultural Analyst.

A PIG MALADY.

DEAR SIR,—I keep a good many pigs, and just now three of them about three months old, and in fine condition, have contracted a disease with which I am not conversant

The symptoms are not unlike gall-sickness in cattle. Staggering of the hind legs, and evidently, from the way they hold themselves, tenderness across the loins. They are inclined to lie down all day, but occasionally get up to eat a little. If you can give me any information as to the disease and its treatment, I shall feel much obliged.

I am informed by a neighbour that hundreds of pigs (principally Kafirs') are dying from the same cause, mostly in the district between here and the coast.—
Yours faithfully, J. D. S.

[From the symptoms described, I am of opinion that these pigs are suffering from rheumatism, and would recommend the following be given a trial :—

Sulph. sub., ½ dram. or ½ teaspoonful.
Sodae salicylas, do. do.
Sodae bicarb., 1 drm. or 1 teaspoonful.

One of these powders to be given to each pig in its food once daily. The sty to be kept dry.—S. B. WOOLLATT, D.V.S., Maritzburg.]

THOROUGHBREDS.

SIR,—In your issue of the 16th inst., I note a letter headed "Hackney *vs.* Thoroughbred," signed W. Henwood, criticising an article of the 2nd by F. Hutchinson, V.S. I say criticising, but truly it is no criticism but a personal attack on Mr. Hutchinson when manager for Mr. Darrell Smith.

Mr. Hutchinson was my neighbour during the two years and four months he held the position, and a more energetic, painstaking manager would be hard to find, and if Mr. Darrel Smith was in Africa I am sure he would lead Mr. Henwood aright.

Mr. Smith brought his stock to my farm before he purchased the adjoining property, Ruiter's Kuil, and my first remark to him was, "You have imported the wrong class of mare." My reasons were, as a rule, they were too old, had mostly all been pampered for show purposes for years, and my greatest objection —money—they had cost too much, even up to 450 guineas. I may mention Mr. Hutchinson had nothing to do with the purchasing of this stock.

All food had to be purchased the first year, oathay very scarce, 70s. to 80s. per 100bdls., mealies and oats also high, and to keep the mares in condition required abnormal feeding.

Mr. Hutchinson had to begin at the the foundation, build stables, enclose farm, break up land, and all other preliminaries.

His first crops were splendid, his second an absolute failure—locusts.

The first foaling season gave over 70 foals from imported and native mares. The majority of colts sold from £15 to £50, showing there was more than one colt bred—and not the one-horse show Mr. Henwood thinks it was, and the breeding was not confined to Hackneys.

The second foaling season was not so good, pneumonia having played havoc among the mares and foals; colts were sold again at good prices.

The colt referred to by Mr. Henwood was all Mr. Hutchinson had to show the first year; his dam arrived in foal, giving her a start of months over the others. The colt was certainly not bred from unsound stock. Miss Syntax, his dam, had been awarded too many prizes and passed before too many Home judges to have a blemish. Mr. Smith thought so much of her that he sent her Home again. The sire is in the country to-day and speaks for himself.

Mr. Hutchinson came out on a two years' engagement, and remained in charge four months longer at the request of Mr. Smith, and then left things in a go-ahead condition.

Mr. Smith sold out close on two years after this, not to cut his loss, as suggested by Mr. Henwood, but to save himself in case of war. He was right; I wish I had done the same, and he told me he had come out square. In his book, "Should I Succeed in Africa," he does not write as a man who had lost much by horsebreeding, but strongly advocates it, only stipulating "don't import mares" (page 35).

Anyone who expects profit from horsebreeding the first three years, especially from imported stock, is asking too much, as it is pay, pay, pay, and all expense. The first three years are always considered the preliminary canter to the real s'art.

To condemn any breed of horses because it has not given profitable results in two years and four months from starting will only be done by those who are absolutely ignorant of horsebreeding, as no management can do impossibilities.

The above is a true statement, and if Mr. Henwood will believe it, he will see how unjust his insinuations are.

I have been horsebreeding many years, and my horses have paid me well. As far as the argument of breed is concerned, I am strongly in favour of thoroughbreds, but I want a horse with a pedigree, not a pedigree with an animal attached. I desire a horse, not a bit of paper, and we have too many sires to-day, if you destroy the paper, you have nothing left. And I in no way see that Mr. Hutchinson in his article disagrees with me, but I find he strongly recommends the breeding of thoroughbreds. I note "Farmer" in the *Times* reads his article as I do. Mr.

Hutchinson recommends the hunter (what is the hunter?—he is, pure and simple, a weight-carrying thoroughbred) to improve our standard. It was through the loss of standard we lost the Indian market. And how did it come about? By using weeds as sires because they could run a bit. And since handicaps have been introduced into our racing, the horses imported for that purpose have become worse and worse as sires.

No one thinks more of blood than I do, but we must endeavour to have the blood combined with other good qualities which can be obtained in the weight-carrying thoroughbred, otherwise known as the hunter, but never from the horse bred to fly five or six furlongs with seven or eight stone up. If speed and other required qualities are combined, no one will object. My remarks do not apply to the breeders of racehorses. Anyone desirous of winning the Breeders' Plate must keep to the strain with speed, speed being the only consideration in a racehorse.

In his article Mr. Hutchinson states: "Again we must not lose sight of the wonderful staying powers possessed by the South African bred animal, and their marvellous adaptability to their native veld. But the question naturally arises: Why not endeavour to retain all these qualities and still bring the stock of this country up to a useful and profitable standard." I consider no man can speak with truth in higher terms of our horses (not even De Wet), as there is no denying the fact they can be greatly improved.

If the Indian Government had placed an order with us for 1,000 horses in January, 1899, of a standard 14·3 to 15·1, we could not have supplied them: if London, for 100 matched pairs, the same applies. And where lies the fault? The sires used are not in themselves up to the standard required.

Mr. Hutchinson considers there is money in breeding Hackneys, and other breeds, but in his article he in no way advocated Hackney at the expense of the Thoroughbred, as he writes strongly in favour of the Thoroughbred, and all I have heard speak on the question understood him so.

In horsebreeding, fashion has to be studied to make it profitable, just as in other businesses. If the monied men of Johannesburg, and other large centres, want Hackneys, Coach-horses, or Thoroughbreds to make a show, they will have them; if we can't supply, they will import. If there is a demand for any particular breed, let us supply; though we may not care for the breed ourselves, we must not lose sight of the fact, it is money that makes the mare go.

Within the last ten years, if I have been asked once I have been asked a hundred times, "Where can I get a good stallion?" With one or two exceptions I was unable to say, as I knew the class of horse wanted was unobtainable, and the farmers were compelled to purchase the class of horse referred to by Mr. Hutchinson, brought round to the farms by Cape, Natal, and Johannesburg speculators.

Again, other horses have been purchased at Home on the off chance of recovery from some malady. I heard remarked of one such, "If he was well advertised he would produce a marked sensation on the stage as a thorough, efficient equine musician," combined with a lovely hollow back. I think it will be allowed such a horse will not improve the present low standard. If not dead, he must be at stud in South Africa somewhere, and he is only one of many undesirables.

JAMES McDONALD.

Dannhauser,
26th August, 1901.

COMMERCIAL ADVERTISERS.

SIR,—On page 355, Vol. 4, of the *Journal*, Mr. Pearce deals analytically with fertilisers. Is he quite correct when he says kainit contains about 13 per cent., potash, and muriate about 60 per cent.? Henwood & Co.'s handbook says kainit contains about 25 per cent.; Sibson gives it as 23 to 25 per cent., and muriate 80 per cent. Who is right?

Lately, I came across a paper telling farmers, etc., what artificials were required for different crops; thus for wheat, oats, etc., and (I presume) mealies: —

Sub. ammonia	... 50 to 150	lbs. per acre.
Basic slag	...300 to 400	,, ,,
Superphosphate	100 to 300	,, ,,
Potash, muriate, or chloride	50 to 150	,, ,,

Further on, the farmer is told that he himself may do the mixing if he keeps in mind the following formula for wheat, oats, etc. :—

Nitrogen	... 4 per cent.
Phos. acid	... 7 per cent.
Potash ...	.. 4 to 9 per cent.

This means :—

Nitrate of soda	... 27 lbs.
Dissolved bones	... 56 lbs.
Muriate of potash	... 20 lbs.

This seems, however, a very small quantity to apply to an acre (of course, I may be wrong in my calculations), and does not at all agree with what farmers are told to use.

To me it appears that if I apply 150 lbs. muriate of potash to an acre I am giving 120 per cent. (according to Sibson) of the pure salt.

I have not written above in any carping spirit, but simply because I cannot understand the figures, and I wish to master them. A reply through the *Journal* will oblige.—Yours truly,

JAMES THORROLD.

Sunday's River.

BRANDING OF CATTLE AND HORSES.

SIR,—Nothing is more unsightly — on a horse especially—than a smudged brand : nothing is more unsatisfactory than an indistinct one, on any animal, from whatever cause. And yet it only wants a little care to produce a uniformly good result, and this is almost sure to be attained if an observance of certain rules and conditions is kept in mind.

1st. The branding iron.—This should be made of a piece of metal $1\frac{3}{4}$ to 2 ins. wide, and $\frac{1}{2}$ to $\frac{5}{8}$ on the back, and tapered to $\frac{1}{8}$ on the face. This piece of metal is bent or welded to form the letter or figure required, and a handle of $\frac{1}{2}$in. "round" iron, 3 to 4 feet long, attached. When the iron is finished it should be neatly filed up to not more than $\frac{1}{8}$in. on the face ; this leaves a clear sharp line on the skin when the brand is applied.

2nd. Formation of the letters or figures. —These should not be elaborate—instance the letter M, this should not be made 𝑀, but M, not G, but G and so on.

3rd. Applying the brand.—Have the iron red-hot, the hotter the better, a mere touch is then enough. This is the principal part of the business, not to *press* the brand into the skin, and so set up an inflammation, which is the cause of a smudged brand, and yet the cautery has to be sufficient to cause the hair to peal off when healing. I do not agree with any healing medium being applied after branding.

4th. Before applying the hot iron have the beast's leg lying in a natural position, so that the design, figure, or letter may appear right when the beast is standing up ; and, if possible, do not put the brand across *two* colours. If the beast should be say red-and-white, on the part to be branded, put the brand on *one* of the colours if possible, even if its position should be shifted a little, as it is always more distinct.

5th. Brands on cattle should not, if at all possible, be made on the rump, as this is a part of the skin which is valuable from the merchants' point of view, and a brand does more damage to a skin than most people would credit, and one has to see a finished tanned and curried article to realize the fact.—Yours, &c.,

CINCINATUS.

A serious deterioration in the pasture of parts of the Argentine Republic is complained of by sheep breeders. On some estancias it is even said that only one-tenth of the stock at one time carried can now be supported, the fine grasses having been eaten out and destroyed. The only remedy is thought to be lucerne. The sowing of various grass seeds is suggested, but this would be less satisfactory than the growth of lucerne.

It is stated that in Columbia (South America) landowners troubled by the prickly pear (Opuntia sp.) have found a cheap and effective means of destroying the plants. In the rainy season bushy lianas or creepers, growing rapidly and producing dense foliage, are planted round the clumps of prickly pear. When they cover them completely they are cut down and burnt in the summer. Most of the prickly pears are destroyed, the operation being repeated at a later date. A third burning may sometimes be necessary. It is essential that a dense growth of vegetation be obtained over all the pears, so that the heat will be sufficient to affect the tissues of the leaves. The common dolichos would be very suitable for this purpose.

Fruit Cultivation.

A CORRESPONDENT has been good enough to send us the accompanying from the *Mid-Lothian Advertiser*. The information is, of course, intended for fruit-growers of the British Isles, but the principles of fruit culture, subject to differences in climate and soil, hold good all the world over :—

Soil, Climate, etc.

Introductory.

So many farmers are turning their attention to fruit culture as an aid to farming that it seems desirable to state what is required in the way of soil, climate, etc., for profitable fruit cultures.

Soil Requirements.

Land for profitable fruit culture must not be heavy and wet, though it should be deep and porous, so that plants may withstand drought. That in good heart from regular cultivation and manuring yields better results than are obtained from ill-cultivated soils heavily manured before planting. In pasture land fruit bushes and trees do not appear to root so quickly, and are more subject to drought injury than in soils which have been well tilled for several years previously. Generally speaking, all ordinary soils can be made suitable for fruit culture by careful preparation, the object of which should be to provide the deepest possible bed of fine, firm, and moist soil for the roots. The utmost care after planting does not compensate for imperfect preparation of the land.

Clay Soils.

Clays are very retentive of moisture and the useful products of manures, but are generally too firm, cold, and damp. Such soils are improved by (1) good drainage, (2), additions of gritty sand, lime, ashes, burnt earth, long straw-containing manure, and similar substances, tending to increase the porosity of the soil, and (3) deep autumn trenching or tillage, involving the land being left in as rough and cloddy a state as possible for the winter, to secure the maximum disintegration of its particles by the action of alternate freezing and thawing of the water with which its interstices are charged.

Calcareous Soils.

The usually greyish-hued soils in which lime predominates generally quickly harden and crack under the heat of the sun. They are greatly ameliorated by heavy dressings of decayed organic matter, nitrogenous substances, decomposed turf, and dark-coloured soil rich in humus.

Sandy Soils.

Sandy soils, which are too porous and have not sufficient cohesion for plants to get a good grip of them, are improved by any additions tending to greater consistency and retentiveness, such as the ploughing in of green crops, large quantities of farmyard manure, vegetable refuse of all kinds, powdered clay, black mud from the bottom of ponds, the cleanings of ditches, and light applications of fish-salt and lime. Evaporation from sandy land during hot weather is largely checked by regular cultivation and the maintenance of a surface mulch of loose soil an inch or two in depth, or by mulching with two or three inches of manure. Sandy land on a clay sub-soil can be admirably fitted for fruit culture by ploughing up some of the clay into the surface soil.

Drainage.

Fruit trees cannot endure excess of water in the soil, and their roots quickly rot in cold, damp ground, so that some system of drainage is absolutely essential to successful cultivation on such lands. The simplest method of draining low, level land is the digging of deep ditches round the fruit plantation, in which the trees may, if necessary, be set on raised mounds. Ordinary drain pipes would soon become choked with roots.

Summary.

Whatever the character of the soil its physical structure must be made as good as possible by preparatory tillage and large additions of organic matter, such as

farmyard and green manures, to enrich it in humus-forming compounds, and to make it more porous, moisture retaining, and easily permeable to surface roots.

Locality and Exposure.

Where fruit is grown for marketing purposes it is imperative to choose a locality having good railway or other transport facilities for its produce; and as the best prices are realised when fruit is sold directly by the grower to the consumer, a place near towns is much to be preferred. Extended planting in low-lying humid valleys is unsatisfactory, because fecundation of the blossoms is retarded or prevented by the fogs and late frosts to which such localities are peculiarly subject. The exposure should be arranged with a view to protecting the trees as much as possible from such winds as usually prevail for any length of time in the locality during spring and autumn. While a southern or south-eastern exposure ensures the best dessert fruits it also encourages early vegetation, which is liable to injury from late frost. Generally speaking, high lands are most suitable for fruit culture. The best slope is one towards any considerable body of water, which will tend to prevent frost injury, and, in default of water, a partially northerly or westwardly exposure may be selected with the object of retarding the blossoming period until urgent danger from spring frosts is past. Where little protection against prevailing winds cannot be otherwise provided, one or two rows of quickly-growing trees may be planted as a wind-break.

Cattle of the Proclaimed Area.

HOW TO RELEASE.

IT is hereby notified, for general information, that, with a view to release from the proclaimed infected area north of the Tugela River of any cattle which are believed to be free from lungsickness, the Government has decided to establish depôts within this area for cattle which can be certified by a Stock Inspector to have been properly inoculated, and to have been free from the disease for a period of two months or more.

Persons in possession of such cattle who are desirous of obtaining their release from the infected area should send in an application to the Principal Veterinary Surgeon, accompanied by the necessary certificate from a Stock Inspector, for permission to remove their cattle to one or other of the depôts.

It must be distinctly understood, however, that all cattle removed to these depôts will be required to remain therein for at least six weeks, and that they will not then be released unless the Principal Veterinary Surgeon is in a position to certify that there has been no disease apparent during that period. Cattle which have recovered from lungsickness ("old lungers") will not be admitted to a clean depôt.

Each depôt will be in charge of a Government Stock Inspector, whose instructions as regards the provision of herds by owners and all other matters will have to be obeyed. Owners must provide at least two herd boys for each troop of cattle and find accommodation and food for same.

In forwarding applications, with certicate, for admission of cattle to a depôt, owners must state where cattle are proposed to be brought to upon release from the infected area, and also what is proposed to be done with such cattle.

C. BIRD,
Principal Under Secretary.

Colonial Secretary's Office,
Pietermaritzburg, 23rd August, 1901.

The inoculation of cattle against plague has been attended with good results in the Soudan; serum was obtained from the Hygienic Institute at Constantinople and from the Cape, the latter giving the best results. In view of the suspicion with which Eastern races regard inoculation of any kind, it must be very satisfactory to the officers in charge of these operations to find that "the natives themselves recognise the efficacy of the serum treatment, inasmuch as they bring their cattle in voluntarily, and ask that they may be submitted to the treatment."—"Live Stock Journal."

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—It is years since we experienced such heavy rains during the month of August as we are having this year. Old colonists will sometimes refer to the August flood, some thirty-five years back; and some of them referring to that event on Saturday last, expressed an opinion to the effect that history was about to repeat itself; however, it is a new experience to hear farmers assert that old land is too wet to plough, and new land is in the pink of condition. Unfortunately locusts are making their appearance in some districts. A large swarm passed over Maritzburg on the 26th instant. Mealies are firming a little, and contrary to the statements of some, a few Districts have better crops of forage than was predicted.

Mealies.—The average price for grain during the fortnight has been 10s. 6d. per muid, including sack.

Hay.—From 2s. 9d. to 3s. 9d. per 100lbs.; bedding, 15s. to 27s. per load.

Potatoes.—Good eating potatoes have varied between 11s. 9d. and 20s. 3d. per 100lbs.; seed of certain varieties have exchanged hands from 5s. 6d. to 9s. per 100lbs. sweet potatoes, from 1s. 9d. to 4s. 6d. per sack.

Beans.—Red beans, from 10s. to 14s. per 100lbs.; Canadian Wonder, from 18s. 3d. to 21s. 6d. per 100lbs.

Peas.—From 9s. 6d. to 12s. 6d. per 100lbs.

Pumpkins.—From 2s. to 8s. per dozen

Onions.—From 16s. 8d. to 25s. per 100lbs.

Mabele.—Some samples have been as low as 6s. per 100lbs.; others from 8s. 6d to 10s. per 100lbs.

Eggs.—From 1s. 3d. to 2s. 4d. per dozen; geese eggs 3s. 6d. per dozen.

Poultry.—Common fowls, from 2s. 4d. to 4s. 9d. each; ducks, from 5s. 3d. to 12s 6d. per pair; turkeys, 12s. to 14s. 6d. each.

Butter.—From 9d. to 2s. 3d. per lb.

Sundries.—Mutton, 4d. to 10d. per lb.; pork, 4d. to 8d. per lb.; bacon, 4d. to 7d. per lb.; ham, 8d. to 10½d. per lb.

Vegetables.—Beans, beetroot, cabbages, carrots, cauliflowers, celery, lettuce, onions, peas, turnips, and tomatoes, at prices to suit all purchasers.

Fruit.—Bananas, lemons, oranges, loquats, limes, naartjes, and pineapples sold every day.

Wood.—From 3d. to 11d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade is, on the whole, in a sound, healthy, condition, and most firms are as busy as it is possible to be. The slow but continuous expansion of business with the Transvaal is a most encouraging sign of the times.

Mealies.—This staple, for weeks past, has been quite a drug in the market, and rates slowly but surely declined, with apparently nothing in view to relieve matters. During the last week, however, an upward move has occurred, and prices are fully 6d. per bag better. There are enquiries from all parts for big parcels, though little actual business has resulted. Rates vary from 10s. 6d. to 11s. per bag.

Potatoes.—Colonial samples are pretty well finished, as it is quite an event to come across any on our market. Australians still hold the field at 8s. per case of 70lbs., though supplies of French "Early Rose" are now coming forward in small quantities.

Mabele is in considerable demand, and rates are firm. Really good samples command 17s. per bag, with supply unequal to demand.

Hay.—This article is in demand with small supply. Farmers ask, and readily obtain £3 per ton of 2,000 lbs. at stations up the line.

Bran.—The Military authorities have bought up heavily this week, and in all probability will clear the entire market bare. A good rise is sure to follow.

J. RAW & Co's SALES.

The following Sales were held by Messrs. J. Raw & Co., and the following prices were realised:—On Saturday, August 10th, at "City Tattersall's," Cow and calf, £18 10s.; wagon and gear, and 14 oxen, £260; 1 horse, 20½ gns.; 1 horse, 20 gns On the same day at Ladysmith, sheep (captured stock) at 7s 3d. per head.

On behalf of the Imperial Government a sale was held at Eshowe on the 6th August, of cast horses. The following prices were realised:—1 gn., £3 5s, 5 gns., 7 gns., £8 15s., £9, £10 5s., £11 10s., 14 gns., £15 10s., and £17.

On Saturday, August 17th, 1901, "City Tattersall's": — Oxen, £16 10s., £17 10s., £18, £19; cows, £7 10s., £10, £14 10s.; horses 6 gns. and 13 gns.; trap harness and 2 horses fetched £81

The monthly Stock Fair of the Nottingham Road Farmers' Association was held at Nottingham Road Station, on Wednesday, the 21st inst. The quantity of stock forward was not large, although prices for cattle still keep up to the average. Mr. R. H. Raw was the auctioneer. Total amount of sale was £700. Following are the prices realised: — Oxen, £19 5s., £20 5s, £21 5s., £22 10s., and £23 5s.; cows, £17 5s., £19 10s, £8, £18; one bull, £14 10s.; heifers, £17, and £16 10s.; ewes 16s., wethers, 22s., 23s., 26s. 6d., and 28s. per head; pigs, 14s., 25s., and 50s.; mealies, 12s. per bag.

During 1900 the Government factories of the Cape Colony supplied to the Railway Department 167,276 sleepers.

In the neighbourhood of the Darling Downs, Queensland, and, indeed, throughout the older colonies, there are numbers of wild cattle. Originally domesticated, through want of care they have strayed, and have become quite wild and useless. As their flesh is good for nothing, they are shot down at every opportunity, the pasture and water they consume being valuable, and, therefore, begrudged them.

The Agricultural Journal

AND MINING RECORD.

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CONTENTS.

Rinderpest in the South.

BY H. WATKINS PITCHFORD, F.R.C.V.S.

DURING the last week it has been found expedient to close our Southern Border against the introduction of horned stock. Rinderpest has advanced step by step from the Cape Colony, and now threatens to invade us from the south.

Steps have at once been taken to place guards on all the gates and openings in the fence happily maintained on this our Southern Border, and in this way the actual ingress of cattle will be guarded against. Whether such precautions will succeed in keeping the disease out of the Colony is a matter of grave doubt, but the Government has decided to do everything possible to prevent this fell disease again getting a footing within our Borders.

If it should again attack us it must be borne in mind that it is impossible for the disease to ravage our herds to the same degree as in the outbreak of '95-'96, and that as the same urgent necessity cannot exist it will be the duty of all stock-owners to remember that organisation and concerted Government action will give the best prospect of successful help for all. The indiscriminate and often selfish action of the farmer who rushes into precipitate and isolated action involves his immediate neighbours

and often the whole country-side in a disaster which might have been avoided had consideration for others in position of equal risk been given a thought.

It was to this headstrong and ill-advised action during the earlier part of the last outbreak that much of the unfortunate results were due.

The Veterinary Department will be able to cope with the disease provided the individual farmer will assist by preventing panic and promiscuous action by irresponsible persons. If a policy of *sauve qui peut* is adopted, in which every one insists on ensuring his own safety, irrespective of his neighbours' interests and his obligations to the State, but little can be done by the Department, and in this case the disease cannot but be sown broadcast.

As in a conflagration in a building the unthinking rush of people crowds out the means of safety, so in a serious outbreak of the disease the urgency and importunity of those often remote from any risk prevents the accomplishment of any good which accrues through organisation and arrangement.

Belgian Hares.

IN the present issue will be found an interesting article from the pen of Mr. Douglas Blackburn on the breeding of Belgian Hares. Mr. Blackburn is the author of the popular booklet "Prinsloo, of Prinsloodorp," and is now in Maritzburg acting as the local representative of the Durban *Mercury*. What Mr. Blackburn has written on the Belgian Hares—which, as a matter of fact, are rabbits—will be found suggestive and valuable. About local conditions much has yet to be learnt. How best to provide cheap succulent and suitable food during the dry season will be one question, and another will be, how do thunderstorms affect them? Thunder and sudden loud noises induce miscarriage in does, and in this country thunderstorms are both noisy, and, for a month or two in every year, are frequent. If, however, the does fail to accustom themselves to the noises of our storms, the losses by miscarriage should not be of material consequence, considering the marvellous fecundity of the species so strikingly described by Mr. Blackburn.

"Lungers."

AN announcement of Mr. Wm. Baynes with reference to certain fat oxen for sale concluded as follows:—"The 'Lungers' will be sold separately, and afford an opportunity rarely met with of obtaining those valuable animals." At the sale the "Lungers" fetched practically the same bids as the other animals of the lot.

Agricultural Produce at Durban.

THE illustrations given in this issue of "War Imports of Agricultural Produce," will afford some general idea of the immense quantity of foodstuffs brought into the Colony during the War. The accumulations shown are not intentional. Practically all that is imported is wanted at the front, but the powers of the railway being limited, the stuff most urgently required is given priority in despatch. At one time every part of Alexandra Square was covered by mountains of cases, and enormous stacks of forage.

Refrigerator Cars.

IN March last Mr. J. W. Moor and Mr. H Blaker saw the Minister of Lands and Works by appointment with reference to providing insulated railway trucks for the dairy business of the Colony. Their request was cordially supported by the Minister of Agriculture and the then Commissioner of Agriculture, who suggested that the insulation of one of the trucks should be carried out according to the designs approved of by Mr. Challis, the Dairy Expert. The suggestion was accepted, truck 301 being fitted up by Mr. Arthur G. Enock, the Cold Storage Engineer. Further information will be found in the subjoined minute and circular.

Hon. Minister of Lands and Works.

Mr. Enock has now fitted up the truck for the conveyance of dairy produce, and I intend to run it with van No. 64, which was specially fitted up by our Loco. Department, on alternate days between Durban and Mooi River. One of these vehicles will be on the train leaving Mooi River at 2.20 p.m. daily, and will pick up consignments of butter, milk, eggs, etc., at intermediate stations for Maritzburg and Durban. I enclose a copy of the circular of instructions I have issued to our staff with regard to these trucks, and shall be glad if you will request the Minister of Agriculture to notify intending senders, so that they may take advantage of the facilities afforded.

Will you also kindly make them acquainted with the fact that ice can be placed in the vehicles as indicated in my circular, and that the stationmasters will render them every assistance.

DAV. HUNTER,
General Manager.

29th August, 1901.

The following is the circular referred to in the foregoing :—

NOTICE TO THE STAFF.

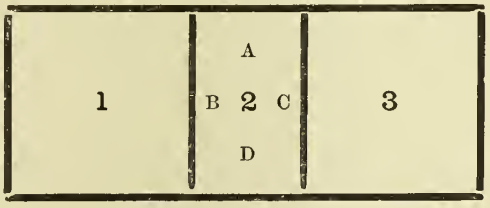
CONVEYANCE OF DAIRY PRODUCE TO MARITZBURG AND DURBAN.

1. The staff is hereby informed that van No. 64 and truck No. 301 have been specially fitted up for the conveyance of dairy produce from intermediate stations Mooi River and below to Maritzburg and Durban.

2. These vehicles, on and from Monday, 2nd September, 1901, will, on alternate days, be attached to No. 119 train at Mooi River, picking up consignments *en route*, and will be returned from Durban to Mooi River by No. 4 train empty so far as the refrigerator chamber (hereinafter described) is concerned, but use may be made of the ordinary compartment for luggage, etc., for stations up to and including Mooi River.

3. These vehicles (*which will be run in addition to the ordinary van on the trains mentioned*) must not be detached *en route*, and the stationmaster, Mooi River, will have them in readiness to be promptly attached to No. 119 train. In like manner the stationmaster, Durban, will have the vehicles expeditiously offloaded and got ready to be attached to No. 4 train.

4. The vehicles mentioned are fitted up as under :—



EXPLANATORY NOTES.

1 Compartment into which ordinary consignments may be loaded.
2 Air-lock compartment.
3 Refrigerator compartment.—Only butter, milk, eggs, and clean vegetables to be placed therein.
A B C D Doors.

5. On arrival at a station where a consignment for the refrigerator compartment (No. 3) is to be picked up, door A or D will be opened, the articles placed in compartment No. 2, door A or D then closed, and door C opened. The articles can then be transferred to chamber 3, and door C closed. The doors A or D may then be opened. *On no account*

must door C *be opened at the same time as doors* A, B, *or* D, as such action would enable the cold air to escape from chamber 3, and thereby cause a rise in temperature, thus defeating the object in view, viz., to keep the temperature as low as possible.

6. Chamber No. 3 in truck No. 301 is fitted with an ice basket, into which 200 lbs. of ice 4 inches by 6 inches cube can be placed by taking off the trap hatch on the roof, *but when such is being done care must be taken to see that door* C *is closed, and that the ice basket is as full at each end as in the centre.*

Van No. 64 contains receptacles into which cans with ice may be placed.

7. The ice will be supplied and placed in the vehicles by the senders, but stationmasters must render every assistance, and be careful that such is done in the aforementioned manner.

8. Stationmasters will make the public acquainted with the facilities afforded for conveyance of dairy produce, and they must see that the consignments are in readiness, and loaded, immediately on arrival of the train.

9. It is desirable that everything possible should be done to ensure the satisfactory transit of dairy produce over these lines; and all concerned are enjoined to accomplish this by giving the matter special attention.

Acknowledge receipt.

DAVID HUNTER,
General Manager.

District Reports.

BULWER, 5th September.—On the 24th and 25th of last month we had two soaking wet days. The grass on the high lands is growing fast, every day almost there is a distinct improvement perceptible. It is some years now since rain has fallen here in such quantities so early in the spring, and it looks very much as though there is to be a repetition of wet seasons, as the scientists predict. There is a very important feature in the rainfall itself, and that is that it should not fall heavily for short periods, but slowly for long or extended periods. This feature has been very noticeable in recent years. Storm rains are usually heavy, and are decidedly beneficial in the spring and at intervals during the wet season for various reasons, but when they fall regularly they are most disastrous to crops and cultivated lands. The Stock Inspector reports there are five flocks of sheep infected with Scab in the Division, and that Miller Bros. are not yet free of the lungsickness, otherwise as far as I know stock of all kinds is free of disease. Mealies have come down in price, as the natives are now offering them at 12s. per bag, exclusive of sack. Mabele or kafir corn cannot be got for less than 20s. to 25s. per bag. The price of poultry varies very much. Common fowls are selling at from 1s. 3d. to 2s. apiece. Poultry rearing in the district is receiving a good deal of attention.

H. W. BOAST, Magistrate.

DUNDEE, 2nd September.—During the last fortnight there have been splendid rains, and the fruit trees are looking beautiful in full bloom, the grass, too, is springing up all round the district. It is to be hoped there will be no more frost this season. The Dundee District Agricultural Society has been reorganised, a strong Committee has been formed, and Mr. Craighead Smith appointed President. Lungsickness is still prevalent, and a number of cattle used by the military died during the last rain from exposure. Cattle-stealing is rife in the neighbourhood, and several cases of sheep-stealing by umfaans have been before me. Contraventions under the Scab Act have been reported, and action will be taken to enforce the Regulations. A grass-fire was started by some natives near Dundee, resulting, amongst other losses, in the death of 73 head of cattle. Vegetables are very scarce and expensive, which cannot be wondered at seeing that they have to be brought from Durban. A number of looted horses were sold the other day, and realised 20s. each and upwards. In a great many instances it would have been more charitable to have shot them. Of course the thrifty Indians purchased a great number.

W. G. WHEELWRIGHT, Magistrate.

ENDWEDWE, 2nd September.—We have had nice weather lately, and there is every promise of a good spring. The thermometer readings for last month are:—Means minimum 54, maximum 67, minimum 48, maximum 85, and for the corresponding month last year:—Means minimum 52, maximum 68, minimum 43, maximum 82. Rain fell during last month on four days, giving a total fall of 2.34 inches, and for August last year we had heavy rain on two days (24th and 30th). Locusts have paid us another visit. One of the largest swarms I have seen passed here about three weeks

ago, and is still in the Location. Stock in this Division is free from disease, and in fair condition.

WALTER H. ACUTT, Magistrate.

HOWICK, 10th September.—The temperature during the past fortnight has been unusually even, the maximum being 92 deg. on 9th instant, and the minimum 40 deg., registered on 28th and 29th ultimo. The general aspect of the country has been considerably improved by the late rains. The grass continues to spring rapidly, and there is already enough for horses, sheep, and goats, and there will soon be sufficient for cattle. On the 5th, 6th, and 9th instant, 0.39 inches of rain fell, but its effect is counteracted to some extent by the hot winds which continually prevail from the north. The farmers of the district are already commencing to plant their crops, and, if the season continues as favourably as it has commenced, they will have a good yield. The fruit trees are everywhere coming into blossom, and seem to be doing well, especially where irrigation is possible. The lambing season has now commenced, and, if fine weather and abundant grass are conducive to success, the farmers' flocks will be greatly augmented.

J. W. CROSS, Magistrate.

NEW HANOVER, 9th September.—Spring has now fairly set in. The weather, so far, is all that can be desired, as far as agriculture is concerned, the hot days we have had being invariably followed by good rains. Stock is picking up in condition. There is a good market for goats in the Division both among Europeans and natives. The prices for full-grown goats range from 15s. to 30s.

A. RITTER, Magistrate.

NKANDHLA, 31st August.—Heavy rain fell throughout the District on the 24th and 25th instant, which has done no end of good. The young grass is springing up well, and the country is already beginning to look quite green. Since the rain the weather has been a good deal warmer. I am pleased to say that the lungsickness during the month has been on the decrease, several herds having been released from quarantine. The death rate so far has been very small, and the disease appears to be in a very mild form. During the rain on the 25th instant a large number of sheep died from cold, one man losing 150 out of some 700. In many parts of the district the natives are putting in their early gardens. At the beginning of the month the Boers raided several mares and foals, and a few head of cattle from the natives, but since the troops moved to the Transvaal border all has been quiet. The health of the district has been fairly good. A large swarm of locusts was seen near the Ntingwe on the 20th inst.

C. C. FOXON, Magistrate.

NQUTU, ZULULAND, 31st August.—The past month has witnessed a decided change in the weather conditions; the early part of it was dry and cold, with an occasional frost, but on the 24th and 25th we had a heavy and continuous fall of rain, since when the weather has become decidedly mild and spring-like. The country, which, under the continuance of the dry weather, was wearing a most dejected appearance, has now assumed a much more cheerful aspect, and those portions which had been burnt have put on a decidedly verdant appearance. In consequence of the poor grazing during the past month or two stock have become poor, and the recent heavy rains have caused a number of deaths among the poorer of them. Lungsickness appears to be slightly on the wane now that the newly-appointed Stock Inspector has got matters well in hand, and has been able to properly supervise the isolation and treatment of infected herds. At the present period of the year matters agricultural are at a standstill, but a continuance of the early rains will witness the commencement of ploughing. The health of the District is, generally speaking, very good.

C. HIGNETT, Magistrate.

RICHMOND, 9th September.—The weather is now gradually becoming warmer with the approaching spring, and the country around has to a great extent lost the dry and wintry appearance which was so noticeable a fortnight since; this is owing to the rain, which has begun rather earlier this year than is usual, and which, though we have only had two slight falls, has caused the grass to spring, and the whole country to look fresh and green. Of this fact the locusts appear to have received early intelligence, as the neighbourhood was visited on Sunday, 1st instant, by a large flight of the same. As far as I am able to judge, however, they did no damage, although it would have been quite possible for them to have done considerable injury to fruit trees, numbers of which were covered with blossom. My experience of the early flights of locusts, however, has been that they feed principally on the young grass, and do not interfere to any extent with any young crops, which at the time are only just appearing. Horses and cattle are benefiting from the young grass, which is springing all over this part of the country. Judging by the appearance of all fruit trees, there should be a large crop of fruit, provided the weather does not become too dry.

J. P. WALLER, Magistrate.

UBOMBO, 31st August. — During the past month the weather has been exceptionally pleasant; a minimum temperature of 49 degrees and maximum temperature of 85 degrees being registered. The rainfall was 2.225 inches, and natives in the vicinity of the Magistracy have been advised officially to start planting forthwith, and not to wait as

customary for the "Hawk" month, i.e., from middle of September to middle of October, this, with a view to avoid, if possible, the probable ravages of locusts. Stock has done remarkably well, and happily lungsickness has not found its way hither yet. A remarkable incident of a two-year-old heifer—presented by Government on the 15th ultimo to a native employee—may be considered worthy of record. A day or two after its receipt by the native it ran away and proceeded to the thorn veld to the east of the Magistracy, and near to the Mkuzi. Another native detailed to find it and drive it back was chased by it, and had to find refuge, as he states, from it, in a tree. A few days later it was reported to have joined a herd of wildebeeste. The owner wished it shot, making an offer of a leg to anyone successful in bagging it. This act was officially forbidden, and orders forthwith issued that anyone shooting it would be punished, the owner being informed that the sum of £10, at least, would be paid him by the Magistrate, personally, in the event of a "cross" with the wildebeeste being obtained. In spite of lions, wild dogs, &c., the heifer still flourishes. It was seen on the 10th instant 8 to 10 miles north of where it was first seen with the wildebeeste, much nearer the Pongola than Mkuzi. It was standing alone some little distance from a drove of its lately made friends, and on the native informant going to look at it, it ran off towards them, thus giving the alarm, and clearing with them. Again it was reported alive and well on the 23rd instant, and finally, yesterday (30th inst.), as having retraced its steps with a herd of wildebeeste to the base of the mountain near the Mkuzi, to about the exact spot where it first entered the Thorns. The natives in this neighbourhood are, like others, greatly interested in its welfare, and several have jocularly remarked that there's no knowing whether it may not ultimately entice a herd of the "Government Cattle" (i.e., wildebeeste), on to the mountain, and thus give them an opportunity of domesticating them!

A. R. R. TURNBULL, Magistrate.

UMSINGA, 28th August.—Spring is now rapidly making its appearance since the welcome rain on the 24th and 25th, on which date fully two inches were registered. It was sadly needed, as the whole of the district had become completely dried up, and streams were hardly running. Natives are now commencing to prepare gardens prior to planting, which should commence in real earnest very shortly. Last season crops were very fair, as this district does not suffer from the ravages of locusts so severely as do the coast districts. This is a matter for congratulation. On the whole the winter has been very mild indeed, and frosts few and far between. The cold rain above mentioned was the cause of the death of a great many lambs and kids, one farmer alone losing close upon one hundred kids in a day. Lungsickness is, it is to be regretted, very rife in this Division, and one cannot turn but for it. A great many herds of cattle are under license by the Stock Inspector. Native cattle have been more fortunate than those of Europeans. It is a noticeable fact that in this district natives own a great many cattle as compared to natives on the coast. This is especially noticeable south of the Biggarsberg and along the Waschbank and Sunday's Rivers. In some instances herds of fifty or sixty can be seen. They own large herds also of goats, which appear to thrive in this part of Natal. Goats of the Angora species are seen in many herds of natives. It is to be regretted that the crime of cattle stealing or killing is on the increase amongst natives, notwithstanding the stringent measures taken by the authorities in their endeavours to stamp it out. The recent disturbed state of this part of the Colony has possibly influenced natives in the committing of this crime.

PERCY V. ESSERY, Acting Magistrate.

The Mealie Market.

MR. T. HYSLOP, Chairman, Farmers' Association, Howick, in his annual report said :—

The general opinion is that the mealie crop this year is a record one for the Colony. It is true that, owing to the exceptionally dry season, many farmers in this district have very poor crops, and other districts have not as heavy crops as was at one time expected; on the other hand, the yield both on the coast and up-country has been very good indeed. There seems little doubt but what there are far more mealies in the Colony than are required for local consumption.

Even last year when the area under cultivation was less, and the crops not so good, the production was in excess of local requirements. From 1st January to 30th June last, the only part of the year when mealies are ever in short supply, there was exported to the Cape Colony, 4,654,609 lbs.; to the Transvaal, 4,373,240 lbs.—total, 9,027,849 lbs.

As against this there was entered for local consumption during the same period 2,780,559 lbs. of imported grain, leaving a balance in favour of exports of 6,247,290 lbs. This being so, I may be asked, what became of the large quantities of mealies

which, according to the customs returns, were imported. The answer is, that the bulk of these are still in bond and will have to be taken into account by farmers and dealers. I have extracted the following figures from a number of tables of figures connected with customs matters published in a recent *Government Gazette*:

	Lbs.
Maize and mealie meal in bond 1st Jan., 1901 ...	8,537,001
Received into bond 1st Jan. to 30th June, 1901 ...	32,435,039
Total	40,972,040

1st January to 30th June, 1901 :—

Taken into consumption ...	1,647,290
Transit to Transvaal ...	1,181,095
Exported by sea	150,278
Free to the Army	8,991,919
In bond on 30th June, 1901	29,001,458
Total	40,972,040

It will be seen therefore that besides the local crops there was in the Colony on the 30th June 145,000 muids of imported mealies which, through a miscalculation on the part of the importers, are lying awaiting a market. It may be thought that it is a mistake on my part to publicly call attention to the large quantities of mealies in the Colony.

I am not of this opinion, however, as no doubt dealers are well enough aware of the facts, and it is well that farmers also should know exactly how things stand. Should Johannesburg be opened up there will, of course, be a large demand at profitable rates; on the other hand, should war continue it would be well for us to endeavour to find a market in the Cape Colony.

Natal Creamery.

I AM informed by the managing director (Mr. Geo. R. Richards, says "Farmer" in the *Times*, that the Natal Creamery has paid to suppliers over £19,000 since it commenced operations about eighteen months ago. At present £1,300 per month is being paid for milk and cream. I was not told the amount of profit realised by the Creamery, but understand that it is a satisfactory one. These figures are sufficient to show what a great success the Natal Creamery has become, and as the business is growing daily, there can be no doubt but what it has a grand future before it. The chief difficulty the Creamery has to contend with is that of conveying its milk and butter to the consumer in Maritzburg and Durban, and this is all caused by the obstructive tactics employed by the General Manager of the Natal Government Railways.

Herrara, the Spanish historian, says that Pizarro, when he landed in South America, owed his life and those of his companions to the fact that one of the party fell off his horse by accident. The natives had succeeded in cutting off the retreat of the Spaniards to their ships, when one of the riders was thrown. The Indians were so astonished at the dissolution of partnership that they took flight at once; they had supposed horse and man to be one animal.

How to improve hard-milking cows is a subject that has been written and talked about ever since dairying began, but a recent writer in one of the stock papers claims to have solved the difficulty. Wait until the cow calves, he says, and then don't allow the calf to suck, or the teats to get wet with milk, but milk her with a strong hand. Just pour out the milk. You will be surprised how the milk valves will open, and what a big stream you can get. During the first twelve hours milk her five or six times. It must be done by someone who has a strong hand, and the best milker on your farm should continue to milk her. I have greatly improved many hard-milking cows in the above way.

"Who's to Blame? Not the Cow."—Under this heading, a champion butter-maker in America says:—The milk when drawn from the cow is generally good, except when the grasses or food which she eats is strongly flavoured, like turnips, rape, and some weeds, or the water she drinks is stagnant or impure. In 99 out of every 100 cans of milk brought into our factories and found to be tainted and faulty, the improper care of the milk after it is drawn from the cow is the cause for its defects. This nuisance of tainted and bad milk is the general cause of so much poor butter being made, and if I were to answer the question, who is mostly to blame for the poor quality of so much of our butter, the butter-makers, the cows, or the dairymen, I should not hesitate to say that the dairymen and creamery patrons are more to blame than the butter-makers, and, least of all, the cow is to blame.

Fruit Trade of Natal.

THE Natal Fruit Farmers' Union publish the following statistics :—

Approximate value of yearly exports of fruit from Natal :—By steamers to coast ports : 14,000 cases, declared value £8,400, freight paid £4,000. By rail inland : 54,070 cases, declared value £32,000, rai (about) £5,400. Total value of cases £40,500 ; paid carriage £9,400. Shipped per annum, 2,800 cubic tons ; railed, 5,407 tons weight. Fruit delivered to markets other than by rail is not taken into account in this statement.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 16th October next :—

Howick.—Two white goats ; blue goat ; black goat ; black ram. All slit tips of ears. On the farm Newstead, and reported by Mr. Willoughby Methley. — Bay filly, black points, long mane and tail, probably three years old this Spring, no marks or brands visible.

Estcourt.—Black heifer, white marks on breast, age, two years. On the farm Strydpoort, of C. M. Pretorious, red ox, branded horseshoe right leg, round horns, left horn bent down, white under throat, also white patch under breast, tail half white, right ear swallow tail, left, point cut off.

Colenso.—Very dark-brown pony, about 13 hands, both hind and off fore feet white, shod all round, probably six year old, no brand ; white boar pig. This animal followed a troop of horses, the property of the Military Authorities, from Ladysmith.

Umsinga.—Grey pony, 14 hands, age seven years, hogged mane, shod all round, indistinct brand near hind quarter ; kafir (she) goat, black ; kafir (she) goat, grey ; bay stallion, age seven years, height 13.3, marks, etc., nil, probable value £5.

Nqutu. — Black goat, impounded by Baleni on 12th June for trespass ; black mare, impounded by Ndita on 21st July for trespass. This mare has no marks, is 14 hands high, and has a long tail.

Boston — Bay pony, near hind foot white, indistinct white mark half way down jaw.

Candella.—Chestnut mare, a little white star on forehead, about 13hds. 2in., about four years old, shod all round, in good condition.

Richmond.—Two large black oxen, both have white hind feet and white tips on the tails, and branded on the left hips very indistinctly, looks like INO or JWD.

Moguntia —Black bull calf, white under belly, no brands.

The difficulties the early Virginian colonists had with their live stock is curiously illustrated by the fact that in the colony of Massachusetts Bay a red calf was cheaper than a black one, experience having shown that the former was more likely to be attacked by wolves, owing, it was thought, to the wolves mistaking it for a deer.

The New Zealand Agricultural Department proposes to receive, grade, kill, pluck, prepare, supply cases, pack, and freeze poultry at the following uniform rates: — Fowls and ducklings, 4d. each; geese and turkeys, 8d. each. The department reserves to itself the right to reject any bird over the age stated, or in poor condition, or otherwise unsuitable, and all birds rejected must be at once removed from the depot by the owner or his agent. Should any of the birds sent be rejected, the officials will endeavour to fill up the crate with suitable birds, and charge actual cost, or dispose of the odd birds at market price. The department will pay railage or steamer freight to the depot on all birds accepted for export. The freight, railage, or other charges on rejected birds will, however, be charged to the owner.

Agricultural Education.

THE following is a statement by Mr. A. N. Pearson, Victorian Chemist for Agriculture, *re* Agricultural Education in Victoria. The statement has been sent, with other papers, to the Minister of Agriculture in response to a request for information as to Victorian methods of agricultural education. The statement is somewhat lengthy, and much of what is recommended may be unsuitable to the present needs of this Colony, but any curtailment would lessen the general value of the statement and be unjust to its author. The principles on which Mr. Pearson bases his various suggestions are, of course, universally applicable. It may be desirable to mention here that the white population of Victoria is about one million and a quarter, and that the annual agricultural products amount to nearly £16,000,000 in value :—

I have the honour to supply suggestions as to an organic scheme of agricultural education in Victoria. It, of course, goes without saying that any scheme of education must have reference to the conditions of the community in which it is to be applied. Also, it will generally be admitted that it is better to introduce improvement gradually by development out of existing methods and machinery rather than by sudden innovation. I have endeavoured to be guided by these general considerations in dealing with the subject.

The subject naturally presents itself under three headings, as it relates, firstly, to children at school; secondly, to youths in training; and thirdly, to adults in practice.

Children at School.

The general principles which should regulate the teaching of children are so admirably laid down in your Commission's Second Progress Report that it is unnecessary for me to say that it would be absurd to make any pretension of teaching farming at primary schools. The proper purpose of a child's education is to draw out and discipline its various facilities, and to this end the child is made to exercise its growing faculties on some subject-matter. The subjects to which a child's attention may be directed are various, and no doubt some have better educational values than others ; but, other things being equal, it is better to train a child by leading it to observe and think about facts with which it will have to employ itself in adult life, than by engaging its early thoughts on subject-matter of which it can afterwards make little direct use.

I am of opinion that certain elementary facts of agriculture lend themselves readily to educational purposes, and that by employing them in a proper way it is possible to so ingrain in the young minds of an agricultural population broad facts of primary importance that they will become permanently assimilated, and serve for automatic guidance in the practical work of later life.

For instance, a child of nine or ten years may be allowed to place seeds of wheat between moist flannel, and observe day by day the germination and growth of root and stem; he may measure that growth and record it: he may see how the delicate rootlets are covered by still more delicate root hairs: and may be allowed to examine them through a magnifying glass; it can be pointed out to him how the tips of the roots naturally curve down and try and pierce through the flannel, and how the young blades seek their way from between the flannel and grow upwards and towards the window or other source of light. He may be allowed to give more water to some, less to others, and none to others again, and will thus get definite knowledge of the primary importance of moisture to plant life. He may keep some of the young plants in the dark, and observe the pale, sickly growth, and then bring them out into the light, and see how quickly they turn green. Later on the child may be allowed to sow the seed in boxes: the boxes may have movable sides, one side perhaps may be of glass; some of the boxes may be shallow and some deep. By-and-bye he may be allowed to remove one side of each box and

be shown how to wash the soil gently away from the root; he will then see what few farmers ever think of seeing, namely, the whole root system of the plant. He may be allowed to tear up a plant by the root, and contrast the few torn shreds of roots with the ample ramification of the complete root system. Such an experiment would be an early exercise for the child in observing the difference between the surface appearance of things and their real nature. Having seen how the plants in the shallow boxes, with the cramped feeding ground, have but a stunted growth, and how the others, with an ample depth of soil, send their roots down to the lowest depths and thrive luxuriantly, the pupil will gain ideas as to how plants feed, which he never can forget, and which, in later life, will enable him instinctively to comprehend some of the principles which underlie the proper cultivation of the soil.

Such simple experiments will, in the hands of a capable teacher, be found to bristle with matter which can be used for both mental and manual education.

At a later period the child may be allowed to carry out simple examinations of soils. With water and a number of bottles he may be taught to lixivate soils and divide them into floating vegetable matter, suspended clay, slowly-settling fine sand, rapidly-settling coarse sand, and gravel or stones; and thus, at one lesson, be familiarised with the principle of lixiviation, and with the mechanical composition of soils. He may then, with the aid of glass tubes containing soils, carry out some simple experiment and observations on the movement of water in soils. I am probably correct in stating that the proper management of soil-moisture is the first factor of successful agriculture over the greater part of Australia, and there is no factor which is more generally misunderstood. By means of simple experiments with soils in glass tubes, as described in my published lectures on "Soils and their Cultivation," a child may be given an exercise in experimental manipulation, and in observation, and may learn incidentally about porosity, capillarity, filtration, and evaporation, while at the same time he would be gaining a knowledge of facts concerning the regulation of soil moisture which are of primary value to an agricultural country.

Afterwards the pupil might begin to learn by actual observation something about the composition of plants. He might take a fresh plant and weigh it; then dry it in an oven—a "Primus" stove oven would do very well or perhaps still better, a small "billy" placed inside a larger "billy," with water between, and suspended over a fire—and afterwards weigh the dry plant. Subsequently he could burn the dried plant to a white ash, and weigh the ash. He could then be allowed to calculate the percentage amount of water, burnable matter, and ash in the plant. The child in this experiment would get its first exercise in analysis, and besides learning the preponderating importance of water in the plant —and for the matter of that, in all terrestrial living matter—would be introduced to a study of the phenomenon of combustion, and would have an arthemetical exercise, and also an illustration of the value of the decimal system. The children could also compete amongst themselves to see which could carry out the simple analysis most accurately, and would thus be shown the difference between correct and incorrect experiment. The pupils could afterwards take the ash, stir it up with water, filter, test the clear filtrate with litmus paper, and learn the cause of the alkalinity; they could then pour acid on the undissolved portion of the ash, and have explained to them the cause of the effervescence. Thus they would learn something of the nature of the ash.

Next they could be allowed to sow seed in four pots, one containing pure sand, another containing sand mixed with plant ash, a third containing sand mixed with a nitrogen compound, and a fourth containing both plant ash and nitrogen compound. Only in the fourth pot would there be successful growth, and by this simple experiment the children would learn a fact of fundamental importance to agriculture which was first disclosed among scientific men only by much research, and is but now filtering down to the masses of practical agriculturists.

It would not be practicable for the children to analyse the ash in detail, but its composition could be explained to them, and by growing plants in pots containing artificial soils from which each of the constituents was omitted in turn, they could learn the importance to plant life of all the constituents.

After this, all of which would be interesting work to both pupil and teacher, there would be but a short step to an elementary knowledge of the chemical composition of soils and of commercial plant foods, and the pupil could make intelligent use of the latter either in growing pot plant, or in clutivating small garden plots.

By a similar progressive course, with, however, less practical demonstration —for the experimental growth of animals does not readily lend itself to work of this kind—the composition of plants and vegetable matter generally may be dealt with when viewed as food for animals; and the pupils may learn elementary facts about flesh-forming food, heat-producing food, and bone-forming food. They may be led to understand something about mixed diets, and may even be given arithmetical exercises in the mixing of fodders.

I may here suggest the usefulness of introducing into the ordinary arithmetic books exercises of an agricultural kind. For instance, the valuation of commercial fertilisers is simple enough for any farmer's child to do. Here, for example, is an illustration of the kind of exercise that might be given :—

If 1 per cent. of nitrogen in a ton of manure is worth 12s., 1 per cent. of phosphoric acid is worth 5s., and 1 per cent. of potash is worth 4s. 6d., what would be the value per ton of a manure containing 5 per cent. nitrogen, 10 per cent. phosphoric acid, and 4 per cent. potash ?

Merely by introducing into ordinary school-books exercises like the above relating to various practices of agriculture, some useful knowledge may be rapidly spread through the country, for farmers' children would naturally speak about such things to their parents.

I would also like to mention here the matter of instruction in the nature and use of statistics. Elsewhere I have used the following words :—"Successful oversight of a country's agriculture depends much upon the use of statistical returns. These statistical returns need to be reliable, and it is a moral duty of citizenship to furnish accurate returns. If some idea of this moral responsibility could be implanted in children's minds when they the impressionable the gain would be great."

Lessons about statistics could probably be introduced into the reading books. Boys, for instance, would be interested in statistics about sport, and a story could be written about the evils resulting from the falsification of returns in some case of rival cricket clubs; this might lead to two or three other lessons showing how statistics generally are collected, and the use that is made of them.

What I have said above will suggest what might be done in various other directions. Similar methods of treatment could be adopted in regard to plant diseases, insect life, and bacterial facts of agricultural significance. Such elementary exercises could not be regarded as having any pretension of teaching farming, and they could be conducted by teachers of no agricultural training.

The first step to the practical application of these suggestions would be to find out how much time could be spared in the schools for the work. With an hour a week during four years a good deal could be done. The time at disposal being determined, the next step would be the preparation of a text-book. The writer of the text-book would have to go through all the proposed experiments and exercises, so as to practically determine the time necessary for their due execution, the appliances needed, and generally to precisely lay down the precautions and conditions needed for successful work. The text-book would be in the form of a reader suitable to be put in the hands of children, and this would be supplemented by a book of detailed directions and comments for use of the teacher. After the teachers and inspectors had studied these books, they would need nothing more than to rehearse the whole programme of work. This could

be done by attendance at the training school in Melbourne, where the organiser of the work would have everything in such readiness that a week or ten days' attendance would suffice for a teacher to go through all the work needed for one year.

As to the preparation of the text-book, I for one should be quite ready to co-operate with any educationist whom the Department of Public Instruction might select to organise the work, and there is little doubt that the other professional officers of the Agricultural Department would likewise be willing.

Thus there would not, it appears to me, be any great difficulty in training the teachers for this section of the work.

Youths in Training.

In this section country youths and town youths have to be considered separately. Perhaps there is no set system of secondary agricultural education in any country that satisfactorily reaches either of these classes of pupils. On the one hand, very few farmers can afford to send their sons to agricultural colleges, they need them at home to help in the farm work. On the other hand, it is a common remark that agricultural colleges do not turn out many practical farmers. It has, for instance, been a complaint that the majority of graduates of American agricultural colleges seek to become teachers or turn to some kind of town life.

I think that farmers' sons might be reached by day or evening classes held in State schools, mechanics' institutes, or large farm-houses, or other available buildings. Lessons of two or three hours' duration might be given during the farmers' slack season, one day a week, or one day a fortnight, or two days together in a fortnight, or at any interval found most practicable; and by such means a fairly good course of theoretical instruction, combined with practical demonstrations, could be given. It need not be claimed that a complete system of this kind could be introduced at once, so as to serve every country district. But one instructor could serve from four to eight neighbouring districts, the number varying according to the frequency of the lessons; and a beginning might be made by appointing only one, two, or three instructors, and afterwards operations could be extended or curtailed according to experience.

As to the qualifications of instructors for this class of work no inflexible rule need be laid down, provided general suitability be proved. I would suggest, however, that, other things being equal, the best class of men would be farmers' sons with an agricultural college training and subsequent experience of practical farming. Such men at first might need some advice and assistance from an experienced educationist in regard to educational methods. The first few men appointed should, perhaps, be of a somewhat superior class to those needed afterwards, as they would have to organise the work and overcome initial difficulties.

As to the nature of instruction to be given, I am of opinion that it should be thoroughly thought out beforehand, and a text-book prepared for the course. In the preparation of this text-book it would be necessary to obtain the co-operation of an experienced educationist, and of the professional officers of the Agricultural Department. The instructors might receive assistance from experts in special operations, who could visit the classes in order to give demonstrations in their specialities. In addition to teaching the principles of agriculture, instruction would have to be given in bookkeeping and surveying for farm purposes.

A course of instruction such as above suggested would not give farmers' sons a complete agricultural education; but it would be a great advance on the present position, in which they receive no instruction. I would strongly urge the advisability of some tentative work in the direction here indicated. After such a course as this, farmers' sons would be in a position to profit by the higher class instruction to be obtained at an agricultural college, if they desired it.

Now, as to the town boys, I am decidedly of opinion that it would be better not to send them straight from town to an agricultural college. A town boy should begin his country training at about the age of fourteen or fifteen. If an agricultural college is to receive boys

of this age, its whole course of instruction must be elementary enough for the mental grasp of such boys, or else it must be extended so as to include both elementary and advanced work. If it be so extended the course must be inordinately lengthened; that is to say, must not be less than four years, and the accommodation and the teaching staff must be increased. In any case, it is necessary that the course of instruction at a college should either include or be supplemented by work on a farm conducted in the ordinary way as a paying business. There is, of course, nothing to prevent a portion of the college lands being set apart to be worked as an ordinary farm; but there would be greater choice of variety if there were farms in different districts to which youths could be sent for this kind of training.

The original intention of the Council of Agricultural Education, so far as I understand it, was to establish in different parts of the country three or four farm schools for elementary agricultural education, and a central college for advanced work. That appeared to me a logical scheme. The Dookie establishment was at first named a farm school; but the Agricultural Education Act made no provision for schools, but only for colleges, and the Dookie school had to be re-named a college, and has since been developing into a college. At present it has the difficult task of carrying out the functions of a farm school, agricultural college, experiment station, stud farm, seed-distributing station, &c.

I do not fully know the history of the "Model Farm" at Royal Park, but believe originally it was intended for educational purposes. The building on it is now used as a benevolent asylum.

At present there are no farm schools in the colony. If the original programme —so far as I understand it—of the Council of Agricultural Education were carried out, this want would be met. But in the absence of such provision, I should, if I wished to send one of my sons to learn farming, first of all place him for two or three years on a good farm, where he would learn the elements of ordinary farm work, and acquire that habit of managing animals which comes from early association with them. I should prescribe a certain amount of book work for him to do in that time, arrange with the farmer to have this attended to, and examine the boy periodically to make sure of his progress. After the boy had completed this short apprenticeship, he would be of an age to profit to the full extent from the theoretical courses at the Dookie College, and would not need to spend a great portion of his time there in going through the drudgery of learning the simpler manual labours of a farm. After his college course he would be fitted to take a subordinate place in the management of a good farm, and with the experience there gained should be competent to successfully manage a farm for himself. This is what I should consider a suitable training for my own son, and with my knowledge of the country, I could select a suitable farm both for the first apprenticeship and for the finishing experience. But every town parent has not this necessary knowledge. I would, therefore, suggest that the selection of suitable farms be undertaken officially by the central educational authority, which should also arrange the conditions for the reception of apprentices at these farms, prescribe the instruction to be given, and periodically inspect and examine as to progress.

In reply to the objection which might be raised that there would be a difficulty in finding suitable farms and farmers for such educational purposes, it is probable that if an enquiry were instituted there would be found several such farms in the colony. Many farmers already take apprentices, providing them with board and lodging and pocket money; and some of these farmers would be glad, in their own interests, to have official advice and supervision in the training of these apprentices. The theoretical instruction of these apprentices would be provided for in the classes already proposed for farmers' sons, if the farms selected were in districts where these classes were held.

After the youths had received their preliminary apprenticeship at the farms, they would be in a position to go through a two years' course at Dookie. This course need not be of such a class as

would qualify for a degree. The Dookie College, if continued as a second-class college, would be in a position to give the kind of instruction needed. Other second class colleges could be established when needed. They should not, I think, give diplomas, but a diploma could be given by an examining body to candidates who, after passing through the college, had had two years' experience of management on an approved farm, and had successfully passed an examination in the principles and practice of farm management.

As to the highest class of agricultural education, such as would justify the granting of a degree, I am not sure that the colony is yet ripe for it. When the proper time arrives the question will have to be considered as to whether a central first class college will be needed for it, or the work should be undertaken by the University. Possibly a chair of agriculture at the University would meet the case, the professor occupying that chair having charge of the "Model Farm" at Royal Park; the physical, chemical, biological, and engineering instruction being given by the existing professors of those sciences.

ADULTS IN PRACTICE.

Under this head little need be said. Much is being done already, and the methods of work are understood.

Popular lectures are useful, as preliminary work, to arouse the interest of the people; but these lectures are to be regarded as mainly introductory to practical demonstrations in the field and factory.

The agricultural societies need to be more educational. It would be well if they could be developed more on the lines of farmers' clubs. If the grants for show purposes were reduced the money saved could be devoted to payment of official judges, and to grants for club rooms, the grants being in proportion to the attendance at farmers' meetings, number of papers read, discussions held, and so on, consideration, of course, being given to the quality of the work. Prizes might be awarded to the best clubs, and for papers and work of special merit. Publication of such papers and the editing of a journal of the societies are matters of detail, which any organiser would consider. I need not enter into further details on such matters.

Analysis of Aloe Ash.

MR. WILLIE NICHOLSON, of Theddon, who, as was stated in the last issue, had decided on sending a sample of aloe ash to Mr. Alex. Pardy for analysis, forwards the result for publication as promised.

THE REPORT.

I have made the following determinations :—

Insoluble matter, sand, &c.	33·74	per cent.
Lime	21·52	„
Phosphoric acid ...	1·29	„
Potash	2·42	„

0·01 per cent. of the phosphoric acid being water soluble.

This would represent in a ton (of 2,000lbs.) 430·40lbs. of lime, 25·80lbs. of phosphoric acid, and 48·40lbs. of potash : that is, about 36 times as much lime, 6 times as much phosphoric acid, and 5 times as much potash as in well made farmyard manure.

The sample naturally contained a good deal of sand, which must of necessity occur when separating it from the land on which it was burned ; and does not represent the true composition (though approximately) of the pure aloe ash.

It will be seen that it has a good agricultural value, probably at the present market prices—not including the lime—running about 16s. per ton ; and taking the lime, much of which is active, into consideration, it may be represented at about £2 per ton.

I may repeat the precaution which should be observed in regard to this fertiliser, viz., that it should not be allowed to lie exposed to rain and moisture before putting it to use, as much of the valuable constituents are soluble in water, and liable to loss by leaching if so neglected ; if it is not spread on the land for which it is intended at once, it should be stored under cover till required.

Notes on Belgian Hare Breeding.

By Douglas Blackburn.

THE following notes may supplement usefully the very excellent article upon the Belgian hare by Mr. H. S. Power in No. 10 of the *Agricultural Journal*.

In-breeding.

I made the acquaintance of the Belgian hare under strikingly interesting circumstances. In 1879 I was told off by the editor of the paper I was then connected with to write up particulars of a series of elaborate experiments then being carried out by a highly cultivated young scientist, whose premature death was admitted by the late Professor Romanes to be a great loss to a valuable branch of science. The late Mr. John Edmondson, a Brighton man, devoted his time and ample means to settling, on a scientific basis, several disputed or doubtful problems in animal physiology. Most people accept in a general way the theory that in-breeding is prejudicial to animal development, but few have proved it. This, among other things, Mr. Edmondson laid himself out to do, and at the time I came upon the scene he was experimenting upon rabbits. In order to ensure satisfactory conditions for the test, he procured a pair of Belgian hares which, in the opinion of experts, represented all that was best in rabbit life. He took the most elaborate precautions to satisfy himself that the pair from which he intended to breed, were absolutely free from taint, and how thorough his preliminary enquiries were may be gathered from the fact that the pair cost him, with the expenses of tests, over £25. Probably no more perfect specimens of the breed were ever mated. Mr. Edmondson constructed at his residence, at West Brighton, an enclosed warren, planted it with the best grasses and succulent weeds that experience could suggest, engaged a man to do nothing but attend to the wants of the creatures, and sat down patiently to watch results. Unfortunately I have long ago lost sight of the pamphlet in which Mr. Edmondson recorded the harvest of his four years' experiment, but I recollect enough to know that within fifteen months this original pair had increased to over 800; that by the end of the second year their progeny had run into thousands, and that in four and a half years Mr. Edmondson calculated that if he had not been compelled to kill off the young through want of room their market value as food, at an average of 4d. per lb., would have totalled over £400. In fact the tables he gave of the rate of progressional increase reminded one of the old problem in mathematical progression—the horseshoe at a farthing per nail, doubled with each nail. The object, however, of the experiment was not to prove the enormous reproductive power of the rabbit, but the effects of in-breeding, and certainly they were surprising. The first eight litters averaged eight apiece, and healthy specimens they were, some of the does attaining a weight of 9 lbs., and two bucks scaled 10½ lbs. But the average weight was 6½ lbs. About the middle of the second year a marked falling off in physique became noticeable. The litters fell to six, five, four, and even three, and when over six, they were puny, feeble specimens, and one or more generally died. At the end of the fourth year a hare weighing 5 lbs. was a rarity, and a litter was never known to exceed six. Mr. Edmondson calculated that had the experiment been carried on on the same lines for five years longer, the breed, if not extinct, would have been a diminutive rat-like creature. When he gave expression to this opinion he was met with the question, why has not the Australian rabbit died out? as that came originally from a single pair. With his characteristic thoroughness, Mr. Edmondson made elaborate enquiries in Australia, and found that the single pair story was, like many popular theories, baseless, for he was able to trace over a hundred importations of English rabbits to Australia—wild and tame—during a period of ten years, which completely disposes of the original pair yarn. At the same time, the effects of in-breeding are observable in the Antipodean rabbit, for they are much smaller than the English species, and I am told that in certain districts

where the creatures have been isolated, they are so puny and die off so rapidly that they have never attained the dignity of a scourge.

Results in the Transvaal.

Since that time I have always taken a great interest in the Belgian hare, and have had numerious opportunities for observing rabbit farming in England, Holland, and parts of Belgium, where the business is reduced to a highly profitable science. Of course the great question is how far the conditions that obtain in Natal and South Africa generally would fit in with the results of my European experience. I induced several people in the Transvaal to rear Belgians, and helped and watched the process. In most cases the results came up to expectations, the exceptions being where the conditions I laid down as indispensable were disregarded. A friend on the East Rand started in 1896 with eight Belgian does and two bucks, which were not, however, what I regarded as good specimens, they having been reared by a coolie, who, I believe, brought them up from Natal. Within two years he was supplying an average of 30 hares a week at 3s. each, which gave him a profit of nearly 2s. 6d. apiece, and he estimated that one Belgian doe was worth on average £4 a year to him. He allowed them to breed six times a year, getting an average litter of seven, of which five lived to marketable st ge.

Management.

That the breeding of Belgians for the table may be made a highly profitable business in Natal and the Transvaal is a proposition that would be impossible to deny, always presuming that the breeder exercises care and discretion. To begin with, the breeding does must be carefully selected, kept in large hutches of the pattern I will later describe, and when, at six or seven weeks old, the youngsters are turned out, they must be kept in a spacious wired enclosure giving at least a square yard to each bunny, and provided with a sufficiency of *fresh* green food in the shape of grasses and juicy weeds as described in Mr. Power's paper.

By ploughing up a plot of land 50 yards square and sowing broadcast black jack, lettuce, coarse cabbage, and any succulent weed that experience shows the creatures will eat, and by cropping this daily, sufficient food will be provided to supply 300 rabbits.

This food supply, especially in winter is, as far as I have been able to ascertain, the only real difficulty likely to occur to the rabbit farmer in South Africa; but a little forethought and arrangement will overcome it. Most emphatically would I protest against the popular notion that a rabbit can be successfully reared by turning it out to shift for itself. It requires care and attention to protect it against many dangers which it is impotent to guard against by itself. Every creature in creation can be, and is, improved by care, and the Belgian hare particularly. The breeding does must be well housed and fed if a healthy, profitable progeny is expected, and it is to them that the principal care must be devoted. The breeding hutch in which her life is spent must be constructed on the following plan, which is practically a canvas variation on the well known wooden Morant Hutch which has been so successful in England. It is 6ft. or 7ft. by 3ft. wide and 2ft. high. The roof, one side, and one end are covered with painted canvas, or stout well-oiled calico. One side and one end are enclosed with inch mesh wire. It has no bottom. At one end is the breeding box, a water-tight compartment of wood 2ft. by 3ft., with an opening to the open portion of the hutch. The floor must be of wood, and raised an inch or so from the ground. Such a hutch need not cost more than five or six shillings. I have made them in the Transvaal for even less. This hutch is placed in the open on a piece of good grass land, and once or twice a day must be moved on, its own width. The rabbit thus exists as nearly as possible under natural conditions, is kept perfectly clean, and free from that contamination which renders the ordinary hutch-reared rabbit an abomination. She spends her life here, producing a litter every two months, which are taken from her at six or seven weeks old, and turned into a wired enclosure of the dimensions I have given, where they run till three months old, by which time they should weigh anything from 4½lbs. to 6lbs., and are fit for market. Their cover inside the enclosure should

1.—Stores at the Point. 3.—Forage for the Front.
2.—Stores in Alexandra Square.

War Imports of Agricultural Produce.

consist of a number of weather-proof boxes, such as whiskey cases, etc., placed in a dry position, and turned bottom upwards with a small entrance. By moving them about once a fortnight perfect cleanliness is secured. Rabbits, and especially Belgian hares require absolute dryness of soil; damp kills them off rapidly, therefore the breeding hutches and boxes for the little ones must have a trench dug behind them to carry off water. Another important point is to avoid handling the does. More harm is done in this way than is guessed. I have examined scores of breeding does who have had their ribs fractured and other internal injuries brought about by the silly meddlesomeness of owners or their children. A Belgian hare is kept for profit, not as a pet, and should be regarded as a wild animal.

Coming to the purely practical part of the business, my twenty years' acquaintance with the subject has satisfied me that breeding for the market can be made much more profitable than poultry farming, while the risk is infinitely less. If properly looked after, a three or four months Belgian weighing 5lbs. and fit for market ought not to have cost more than 6d. to rear, and should bring at least 2s. When the promised cold storage vans are available on the N.G.R. the demand on the Rand alone for this article of diet should keep many rabbit breeders going.

How to Begin.

The best course for a person to adopt who wishes to embark in the business is first to enclose with stout inch mesh wire a space from 50 to 100 yards square, in a dry spot open to the sun and the same time having some shelter. A space of 100 yards square, or as much more as can be spared, should be ploughed up and sown broadcast with blackjack, thistles, cabbage, lettuce, pumpkin, and grass, and got well under weigh before the rabbitry is stocked. Then purchase ten of the best does obtainable and two or even three bucks, and proceed to breed. A native or coolie should be told off to do nothing else but attend to the rabbitry. That should be his sole duty, for as soon as he is inspanned for general work the rabbitry gets neglected, and disaster is the result. By the time 100 rabbits have arrived he will find all his attention needed for them. I presume that snakes and hawks would be the principal pests of the rabbit breeder in Natal, but I am assured that if the inch wire net is properly pegged down and the enclosure looked over frequently, snakes rarely get inside Hawks accounted for a large number of youngsters at the East Rand rabbitry, and a boy with a gun had to be constantly on the *qui vive*. Of course the runs of the young ones can be wired on the top, and the extra expense would be justified. There are several excellent books on the rabbit, from which details of breeding can be obtained, but it must not be forgotten that the conditions that prevail in England may not necessarily apply to Natal. For example, I have noticed that the Belgian hare does not grow so fast here, nor attain quite the same weight as at Home. Neither does the doe litter with such regularity as to number. It is not unusual to find a doe throwing nine at the first litter, then six or even five, then jumping to eight. The only rabbit disease I have yet heard of in Natal and the Transvaal is the very common liver ailment. There is, however, a certain and speedy cure—knocking on the head. It does not pay to doctor a rabbit, not even a prize animal. At the first symptom of sickness weed him out, and the first loss will be the last. I agree with Mr. Power on the unwisdom of attempting a a cross. The Belgian hare is as perfect an animal as need be. His colour is that of the wild rabbit, and his flesh is firm and sweet. I have seen hundreds of results from crossing with the Flemish giant, but the product was a bastard in every sense.

Locust Report.

MR. BROWN, Stock Inspector, Lower Tugela, reports on the 1st instant:—Only one swarm of locusts has passed over here during the last month. The swarm came from Zululand, and was not a very large one. The locusts did not settle, but passed on. This District for the month has been very free from locusts.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
J. Swales ...	Inandwa & Ndwedwe	Lungsickness	Grichie ...	Newlands.
B. Wilkes ...	Estcourt, between	Scab	A. Harding ...	Driefontein
	Bushman's and	,,	F. R. Moor ...	Greystone.
	Little Tugela	,,	Cooke & Co. ...	Blue Krantz.
	Rivers	,,	F. Bloy ...	Monte Christo
		,,	J. G. Maritz ...	Vi Plaats.
		,,	F. Knapp ...	Klipfontein.
		,,	G. M. Rudolph ...	Spitzburg.
		,,	J. W. Moor ...	Moorleigh.
		,,	Nqatabaan ...	Moord Spruit.
		,,	J. Oates ...	Oatsvale.
		,,	P. J. Bester ...	Rensburg Spruit.
		,,	R. C. O'Neil ...	Hillgrove.
		,,	C. J. Labuscagne...	Haatsfontein.
J. Button ..	Estcourt, South of	,,	S. Nel ...	Wagon Drift.
	Bushman's River	,,	C. Cope	The Hoek.
		,,	C. B. Lloyd ...	Hidcote.
		,,	Mrs Lindsay	Ros bank.
		,,	W. J. Dickens ..	Derby.
		,,	Geo. Gibson ...	Craignevin.
		,,	S. C. Boshoff ..	Waterhoek.
		,,	L. Schomann ...	Twyfelfontein.
		,,	S. Schomann ...	Willow Grange.
		,,	C. Groom ...	Springvale.
		,,	W. McFie ...	Highlands.
		,,	J. K H Miller	Beacon Hill.
A. H. Ball ..	Weenen ...	,,	W. Lotter ...	Doornkloof.
		,,	P Van Rooyen ...	Middleburg.
		,,	C. P F. Van Rooyen	Mona.
		,,	G. R. Van Rooyen	Victoria.
		,,	P. Lotter ...	Buffelshoek.
		Lungsickness	Mgina... ...	Location
J. J. Hodson ...	Lion's River ...	Scab	W. Taylor ...	Ferdoun.
		,,	W. T. Shaw ...	Shawswood.
		,,	W. Pepworth ...	Bolesworth.
		,,	Mrs F. McKenzie	Onverwacht.
		,,	W. L. Methley ...	Newstead.
		,,	S. Nurden ...	Wood Farm.
		,,	F. Curry ...	Weltevreden.
		,,	Geo. Woodhouse	Halliwell.
		,,	M. A. Sutton ..	Thorney.
E. J. B. Hosking ...	Upper Umkomanzi	,,	F. Nicholson ...	Alton.
R. J. Raw ..	Impendhle ...	,,	C. P. Spiers ...	Mount Park.
		,,	Sobuqu, Verta & Pinda	Natal Land & Colonisation Co's farms.
		,,	Nozulela ...	Nooitgedacht.
		,,	T. Fleming ..	Good Hope.
		,,	J. W. Brocke ...	Impendhle Store.
		,,	G. Renyard ...	Hamilton Hall.
		,,	A. C. Crosse ...	Dingley Dell.
		,,	R. Gresham ...	Castle Howard.
		Lungsickness	C. C. Lewis, and Native ...	Clairmont.
W. Wilson ..	Polela	,,	Miller, Bros. ..	Fairacres
		Scab	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
		,,	R. Nicholson ...	Lowlands.
		,,	R. C. Gold ...	Woodend.
C. E. Hancock ...	Ixopo ...	,,	R. Kennedy ...	Cornhill.
		,,	A. Watson ..	Rosehill.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
C. E. Hancock ...	Ixopo ...	Scab	W. Gray ...	Helmsley.
		,,	Natives ...	Langefontein.
		,,	J. Dalgarno ...	Abercairney.
		,,	A. Stone	Craigie Lee.
		,,	W. W. Walton ...	Dronk Vlei.
		,,	P. J. Webb ...	Crystal Manor.
		,,	L. Howes ...	Mornington.
		,,	G. Thompson ...	Cromwell.
		,,	J. Anderson ..	Littledale.
		,,	Est. R. Raw ...	Eastwolds.
		,,	Lulakana ...	Mackenzie's Farm.
J. F. Bernard ..	Newcastle	Lungsickness	J. Mortimer ...	Try Again.
		,,	P. W. Dept. ...	Newcastle T'Lands
		,,	G. E. Jubber ...	Brackfontein.
		,,	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		,,	A. Paine ...	Mount Prospect
		,,	G. W. Nourse ...	Ruth.
		,,	Simeon Ndhlovu	Freda.
		,,	G. W. White .	Ruth.
		,,	C. R. Savory ...	Pomeroy and Evin.
		,,	Blizzard & Pratt	Ingogo.
		,,	J. W A. Welsh ...	Paradise.
		,,	G. Wood ...	Heron's Court.
		,,	A. F. Henderson...	Brazil.
		,,	A. J. Crawford and Natives ...	Diamond.
		,,	Lowrens and Van der Merwe ...	Buffalo River.
		,,	H. Fick ...	Northdown.
		,,	H. Austin ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	Natives ...	Elizabeth Dale.
		,,	J. Masangu ...	Pernambuco.
		,,	Funwayo ...	Tiger Kloof.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	G. W. Nourse ...	Glen Harte & De Wetstroom.
		,,	W. Steele ...	Tweefontein.
		,,	— James ...	Newcastle.
		,,	Umketega ...	Vrede.
		,,	Bonombi ...	Heron's Court.
		,,	F. Stevens ...	Newcastle.
		,,	A. J. Hurd ...	Tweefontein.
		,,	G. J. Way (Derelict Stock) ...	Vrede.
		,,	Mtshabane ...	Reserve.
		,,	Mahakan ...	Kilbarchan.
		,,	Johannes ...	The Reserve.
		,,	Umbetta ...	Freda.
		,,	Maling & Sibibi...	Blauwboshlaagte.
		,,	Umgubana & Mahlogozulu ...	Hope Farm.
		,,	S. W. Reynolds ...	Ramsgate.
		,,	Mangweni ...	Hope.
		,,	W. Uquhart ...	Laureston.
		,,	Jack Unguni ...	Blauboshlaagti.
		,,	Umpegelele ...	Kilbarcean.
		,,	A. J. Crawford ...	Newcastle.
		,,	W. Adendorff ...	Sanford.
		,,	S. W. Reynolds ...	Minster.
		,,	Umgodini & Kumalo	Greenwich.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	H. Meineke ...	Ruston.
		,,	Umbobojan ...	Valsefontein.
		,,	Mrs. H. C. Shorter and Sambana ...	Spectacle Spruit.
		,,	J. T. Grant ...	Rooi Pont.
		,,	C. Jackson ...	Yarl.
		,,	H. C. Dicks ...	Minster.
		,,	T. Ferrier ...	Henley.
		,,	Sekonyana ...	Rooi Poort.
		,,	McMurray & Hurd	Greenwich.
		,,	J. Surtees ..	Newcastle
		,,	Tinta ...	Ballengeiches.
		,,	Verasamy ...	Newcastle.
		,,	Tunziane ..	Blauwbosblaagte.
		,,	W. G. Moss	Mossdale.
		,,	J. R. Watt ...	Main's Camp and Bothadale.
		,,	Umkonazi & Pochies	Milton.
		,,	W. L. Oldacre ...	Bradfield.
		,,	C. Kennedy ...	Tennyson.
		,,	Freeman ...	Shakespeare.
		,,	Jim Gama ..	Blauwboschlaagti.
		,,	A. James ...	Kabbaslaagti.
		,,	A. Osborn ...	The Mount.
		,,	Wade & Andrews	Macclesfield.
		,,	A. Vanderplank ...	Eagle's Cliff.
		,,	Umshafut ...	Shakespeare.
		,,	J. C. Richards ...	Rooi Pont.
		,,	J. Kumalo and Ndhlebe	Massondale.
		,,	Makehla ...	Tiger Kloof.
		,,	Nehorcsing ...	Newcastle.
		,,	Indians ...	Bosch Hoek.
		Scab	G. J. Way ...	Vrede.
		,,	G. Star ...	Lennoxton.
		,,	R. S. Miller ...	Geloch.
		,,	C. G. Palmer ...	Dry Cut.
		,,	J. Davidson ...	Lennoxton.
		,,	A. J. Debenham ...	Knowsley.
		,,	G. Wood ...	Heron's Court.
		,,	A. D. Uys ...	Horn River and Mooi Krantz.
		,,	T. Ferrier ...	Henley.
		,,	G. Jackson ...	Try Again.
		,,	W. Richards ...	Tweefontein.
		,,	W. E. Few ...	Erin & Imbezana.
		,,	Blizzard ...	Ingogo.
		,,	W. Short ...	Potter's Hill.
		,,	J. Matthews ...	Shakespeare.
		,,	G. Brown ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	R. S. Armitage ...	Boschhoek.
		,,	H. P. Beare ...	Harte River.
		,,	— Wood ...	,,
		,,	Jim Smith ..	Lennoxton.
		,,	S. W. Reynolds ...	Minster & Ramsgate
		,,	N. H. Fick ..	Wykom.
		,,	A. Vanderplank ...	Eagle's Cliff.
		,,	W. Nicholson ...	Rooi Poort.
		,,	M. C. Behr ...	Shuttleworth.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Scab	H. Meek ...	Diepe Hooten.
		,,	J. McDonald ...	Yarl.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	Anea & Latcham	Plessis Laager.
		,,	W. Oldfield ...	Ambleton.
		,,	Jonas ...	Slangspruit.
		Scab	Dickinson Bros. ..	Braeburn.
		,,	Ulukozana ...	Bishopstowe.
J. Chaplin ...	Klip River ...	Lungsickness	A. H. Spring ...	Reserve.
		,,	A. Armstrong ..	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ..	Grobblar's Kloof.
		,,	Natives ..	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	Pepworth & Reid	Reitfontein
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein
		,,	J. Van Whye ...	Ladysmith T'Lands
		,,	G. J. Heslop ...	,,
		,,	H. E. K. Anderson	Gedula.
		,,	E. F. Gibbens ...	Plaat Berg.
		,,	G. F. & J. Woodhouse	Davel's Hoek.
		,,	Natives ...	Georgina.
		,,	G. J. McDuling ..	Waterford.
		,,	Natives ...	Langverwacht.
		,,	Nondo Gama ...	F. J. Dewaals' farm
		,,	A. Boers, & Native	Marais Vel.
		,,	W. Neizel, & Natives	Roosboom.
		,,	Natives ...	Doornkraal.
		,,	E. Walker ...	Doornkloof.
		,,	J. Umpbleby ...	Springfield.
		,,	F. N. Nel ...	Catherine.
		,,	Natives ...	Macpherson'a farm.
		,,	P. Ruiter ...	Ladysmith.
		,,	Mdhlondhlo ...	Blaaubank.
		,,	Jobisa ...	Lombard's Kop.
		,	Nosubala ...	Weltervreden.
		,,	H. E. K. Anderson and others ...	Dewdrop.
			Nondabola ...	Zwaart Kop & Dew Drop.
		,,	— Sandals ...	Home Farm.
		,,	B. G. Zietsman ...	Bosberg.
		,,	Natives ..	Roodepoo. t.
		,	W. Cochrane ...	S. Wiltshire's farm.
		,,	J. de Jongh & Natives ...	Potini Spruit.
		,,	Natives ...	Reit Kuil.
		,,	A. S. McHattie ...	Wessel's Nek.
		,,	Cory & Long ...	Ladysmith T'Lands
		,,	Henderson ...	Weltervreden & Paarde Vort.
		,,	Scomber ...	Kleinfontein.
		,,	G. Robinson ...	Little Magara.
		,,	Natives ..	Dreifontein.
		,,	J. Farquhar ...	Stuart's Park.
		,,	Malela ..	Reit Kuil.
		,,	P. W. Dept. ...	L. Smith Tn. Lds.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Lungsickness	Myanga Tigalala...	Umhlumayo.
		,,	A. Henderson ...	Nelthorpe.
		,,	Malife	,,
		,,	T. Wright	Davel's Hoek
		,,	Natives	Jonono
		,,	P. Tondo	Weston
		,,	H. Neville	Quagga's Kirk
		Scab	J. H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson ...	Walker's Hoek.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	E. F. Gibbens ...	Plaat Berg.
		,,	G. Wetherill ...	Walker's Hoek.
		,,	A. Krogman ...	Brakfontein.
		,,	M. W. Krogman...	Dreifontein.
		,,	P. Marais ...	,,
		,,	H. Boers ..	Dew Drop.
		,,	G. Spearman ...	Feir View.
		,,	J. Van Reenen ...	Wessel's Nek.
		,,	A. Boers ...	Marais Vel.
		,,	A. Carbutt & J. Good	Matiwaan's Hoek.
		,,	Sparks Bros. ...	Ladysmith.
		,,	J. de-Waal ...	Blaubank.
		,,	F. J. de-Waal ..	Lombard's Kop.
		,,	G. Innes ...	Eland's Laagte.
		,,	J. Umpleby ...	Springfield.
		,,	A. J. Taylor ...	Arnot Hill.
		,,	R. Horsley ...	Warrock.
		,,	Dr. Helps ...	Roosboom.
		,,	Corrige' ...	Koolfontein.
		,,	Cockrane & Illing	Dansekraal.
		,,	H. S. Bowers ...	Zaaifontein.
		,,	A. Henderson ...	,,
		,,	A. Henderson ...	Eenvogle Vlei & Elandslaagte.
		,,	G. Ashby	Acol
J. A. Morrison ...	Durban & Umlazi	Lungsickness	H. F. Pearson ...	Everton.
		,,	Natives ...	Unini Location.
		,,	R. H. Stainbank...	Stamford Hill.
		,,	A. S. Goble ...	,,
W. Freer ...	Upper Tugela ...	,,	Borbasee ...	Krom Draai.
		,,	S. Sharratt ...	Klein Waterfall.
		,,	Natives ...	Green Point.
		,,	A. H. Coventry ...	Earthcote
		,,	Mdhlenjana ...	Mooi Hoek.
J. R. Cooper ...	Nqutu & Nkandhla Districts, Zululand	,,	A. Barklie ...	Nqutu Hill, Nqutu District.
		,,	Natives ...	Telezi Hill, ,,
		,,	,,	Nqutu Hill, ,,
		,,	C. Johnstone ..	St. Augustines, ,,
		,,	Natives .	,, ,,
		,,	,,	Rorke's Drift, ,,
		,,	E. P. Vant ...	Vant's Drift, ,,
		,,	Natives ...	,, ,,

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. R. Cooper ...	Nqutu & Nkandhla Districts, Zululand ...	Lungsickness	Natives ...	Segweni, Nqutu Distrlct.
		,,	Umasesa ...	Hlati Spruit, ,,
		,,	Natives ...	Mangeni, ,,
		,,	H. Fry ...	Mpandhleni, Nkandhla District.
		,,	P. Zietsman ...	Near Umhlatuzi, ,,
		,,	Natives ...	,, ,,
		,,	Hutchinson and Hyslop	Near Magistracy, ,,
		,,	Struben, Bottomley & Loxton	Upper Umfongosi, ,,
		,,	,,	Middle ,, ,,
		,,	,,	Lower ,, ,,
		,,	,,	Qudeni Hill, ,,
		,,	J. Vanderwesthuisen	Near Inzuzi, ,,
		,,	H. Swanfield ...	Qudeni, ,,
		,,	Schonyana ...	Babanangu ,,
G. Gielink ...	Eshowe. ...	,,	Sibobile ...	Matikulu, Eshowe District.
	Entonjaneni, and Umfolosi Districts, Zululand.	,,	Umhlukwana ...	Umsunduzi, ,,
		,,	A. Garland, ...	Bond's Drift, ,,
		,,	G. Higgs & Co. ...	Umhlatuzi, ,,
		,,	P. W. Labuscagne	,, ,,
		,,	F. McGuire ...	,, ,,
		,,	L. Schultz ...	Near Eshowe. ,,
		,,	Luigie ...	Umfuli, Entonjaneni District.
		,,	W. Calvery ...	Wansbeck. ,,
		,,	L. Kritzinger ...	Osborn, ,,
		,,	R. J. Ortlepp ...	Merino, ,,
		,,	J Fry ...	Empepala, Eshowe ,,
		,,	James Umtembu	Entumeni, ,, ,,
		,,	J. R. White ...	Schuithoek, Entonjaneni District.
		,,	P. Pretorious ...	St. Andrew's, M.S, Eshowe District.
		,,	Military Cattle ...	Eshowe, ,,
		,,	Butze ...	,, ,,
		,,	Volker, Schultz, F. Stockholm	Port Durnford ,,
		,,	P. W. Dept. ...	Eshowe ,,
		,,	P. Nel ...	Umhlatuzi ,,
		,,	B. and F. Green ...	Inyoni ,,
		,,	W. Magee ...	Umlalazi ,,
		,,	Arnold, Rorck and Magee	,, ,,
		,,	— Corbett ...	Amatikulu ,,
		,,	J. Henwood ..	Inyoni ,,
		,,	F. Green ...	Ungeye ,,
		,,	G. Müller ...	Duikerhoek, Entonjaneni District.
		,,	F. Buys ...	Barneveld ,,
		,,	Damusa ...	Kemp's Farm, Melmoth ,,
		,,	H. T. James ...	Prospect ,,
		,,	F. A. Ortlepp ...	Saxony ,,
		,,	T. Smith ...	Oakdale ,,
		,,	J. A. Ortlepp ...	Vlakbult ,,
		,,	J. R. White ...	Elizabeth ,,
		,,	T. Cooper ...	,, ,,

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
G. Gielink ...	Entonjaneni, and Umfolozi Districts, Zululand.	Lungsickness	Jas. Howe ...	Lower Tugela, Eshowe District.
		„	E. W. Lamb ...	Amatikulu „
		„	C. Adams ...	Umlalazi „
		„	F. Dickens ...	„ „
		Scab.	R. J. Ortlepp ...	Merino „
		„	W. Pretorius ...	Wansbeck.
W. W. Dore ...	Portion of Zululand North of White Umfolozi and	Lungsickness	Dinizulu ...	Hlabisa District.
		„	Surrendered Boers	„
		„	C. Wheelwright ...	Nkonjeni, Mahlabatini District.
	Umfolozi Rivers	„	— Van Rooyen ...	„ „
		„	E. Loffler ...	Bulwana, „
		„	Magojala ...	„ „
		„	Umbambo ...	Stone Hill.
A. Klingenberg ...	Umsinga ...	„	Dr. J. Dalzell ...	Gordon Memorial M.S.
		„	N. Smit ...	Tugela Ferry
		„	Nqala ...	Location.
		„	C. P. K. Vrey ...	Kalkfontein.
		„	Ungangaza ...	Pression.
		„	E. V. L. DuBois ...	Vergelugen.
		„	Natives ...	Renier.
A. J. Marshall ...	Dundee ...	„	Natives ...	Navigation Colliery.
		„	N. Glutz ...	Swiss Valley.
		„	C. F. Van Rooyen	Davelsberg.
		„	H. J. Harris ...	Sterkstroom.
		„	D. Neumann ..	Waterfall.
		„	Natives ...	Weltevreda.
		„	S. N. Robins ...	Dundee.
		„	N. Glutz ..	Morgenstont.
		„	Natives ...	Maybole
		„	Umonto ...	Crown Lands, near Dundee.
		„	J. F. Johnson ...	Dewaar's Nek.
		„	Murray & Co. ...	Navigation Collieries
		„	J. Kemp & Natives	Kelvin
		„	J. H. Reis ...	Longfontein.
		„	J. Landman ..	Boschfontein.
		„	D. C. Pieters ...	Goedekeus.
		„	A. J. Hurd ...	Waschbank.
		„	J. A. Naude ...	Dewarsberg.
		„	Umsombuloko ...	Hatting Dale.
		„	Umnyesa ...	Klipwe.
		Scab	A. Jansen ...	Sheepridge.
		„	J. H. Erkland ...	Carolina.
		„	F. J. deWaal ..	„
		„	J. H. Reis ...	Longfontein.
		„	J. W. Dupreez ...	Jackalsfontein.
		„	H. J. Hearn ...	Hatting Spruit.
		„	N. Glutz ...	Swiss Valley.
		„	C. F. Van Rooyen	Davelsberg.
		„	Maritz & Thornhill	Aletta.
		„	W. V. Marshall ...	East Lynne.
		„	P. J. Gouws ...	Uitflucht.
		„	H. Harris ...	Sterkstroom.
		„	Murray & Co. ...	Navigation Collieries
		„	J. J. Uys ...	Verdenk.
		„	P. H. Swart ...	Hartebeestefontein.
		„	H. J. Nel ..	Blinkwater & Evansdale

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ...	Dundee ...	Scab	A. G. Vincent ...	Craigieburn.
		,,	D. Meumann ...	Waterfall.
		,,	Turnbull & Co. ...	Washbank.
		,,	Peerbhoy ...	Dundee.
		,,	H. J. Hearn ...	Double Kraal.
		,,	Thos Dewaar ...	Navigation.
		,,	A. B. Daniel ...	Beith.
		,,	H. Kriel ...	,,
		,,	F. Kolbe ...	Langfontein & Staat.
		,,	G. Colbe ...	Zwaartwater & Rest
		,,	R. J. Marshall ...	Cleveland.
		,,	G. F. Ferreira ...	Hyle.
		,,	J. Kemp ...	Kelvin.
		,,	J. Campbell ...	Manor Park.
		,,	Marshall Bros. ..	Cleveland.
		,,	J. Meyer ...	Mauchline.
W. A. Hutchinson	Alfred ...	,,	A. J. Potgieter ...	Dewaarsberg.
		,,	W. Stafford ...	Sutherland.
		,,	Nqubu ...	Location.
		,,	Ngihla ...	St. Mary's.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	Makubana ...	Amaci Location.
		,,	Natives ...	Hungerspoort.
		Scab	A. P. Vandermerwe	Poortje.
		,,	A. J. Harding ...	Zwart Kop.
		,,	J. Dryer ...	Culfergie.
		,,	C. C. J. Bester ...	Brand Kraal.
E. Varty	Umvoti—Western Portion	,,	J. M. Wales ...	Farleigh.
		,,	A. M. Hofmeyer...	Emandhlini.
G. N. Perfect ...	Umvoti—Eastern Portion	,,	G. T. Van Rooyen	Daas Klip.
		,,	L. J. Nel ...	Glenboig.
F. E. Van Rooyen...	Kranzkop ...	,,	L. J. Potgieter ...	Broedershoek.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	— Thompson ...	Marburg.

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand have been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
11th September 1901.

M. J. HIME,
for P. V. Surgeon.

Review.

REPORT OF THE GOVERNMENT ENTOMOLOGIST OF CAPE COLONY FOR THE YEAR 1900.

THIS valuable report, whilst dealing only with the work and observations of a short season, contains much of local interest.

Beneficial Insects.

Seventeen pages are devoted to an account of the Cape Entomologist's work in connection with the introduction of beneficial ladybirds—insects which prey upon destructive scale insects and aphides. It would appear that Mr. Lounsbury spent five or six months in the United States of America, and during that period collected and sent to Cape Colony numerous species of ladybirds. This work was undertaken at the desire of the fruit growers of the Colony; but the question of whether such introduction will prove efficient is one on which opinions are divided. "No hope at all" writes the author, "was obtained from Dr. L. O. Howard, Entomologist to the United States Department of Agriculture, nor from his chief assistant, Mr. C. L. Marlatt.

They would not actually say that they thought there was no chance, but let it be inferred that there appeared so little chance that it were much better to expend one's energies in developing and encouraging artificial remedies, the use of which they considered would probably still be profitable, if not absolutely necessary, in the event of the best possible parasites they could imagine being found. On the other hand the Californians were quite hopeful in their views."

Plant and Fruit Imports.

Finds of injurious insects among plants imported from abroad are reported as rather numerous. 'Two large consignments of assorted fruit trees from Sydney, New South Wales, together valued at £700, were found to bring with them the San José or Pernicious Scale and the Black Peach Aphis. Both lots were confiscated, and every tree and all cases and packing material burned on the beach. The San José Scale is the notorious insect which has made such a commotion among horticulturists in the United States of recent years, and has led to Canada and several European countries legislating against American nursery stock. Later in the year several ash trees were found badly infested with the Oyster Shell Bark-louse. These trees were promptly burned." These finds, with others, go far to confirm the necessity of the regulations recently brought into force in Natal as neither the San José or the Oyster Shell Bark-louse of the apple are known to occur in this Colony.

Tick—Heartwater Investigations.

Particularly interesting in the report are the experiments designed to establish the connection between tick parasites and the heartwater disease of sheep. These are given in detail in the report, and the following summary by the author will be read with general interest:—"Research in the particular line was suggested by the findings of Government Veterinarian Dixon in regard to the contraction of the disease on the veld independent of food and drink (see *Agricultural Journal*, June 23rd, 1898), by the popular notion amongst farmers that the Bont Tick was concerned (for instance, see evidence of Mr. J. Webb before Cattle Diseases Commission, 1876), and by sundry facts that came under the writer's observation whilst elucidating the life history of the Bont Tick at Fort Beaufort in 1899. Indications that the Bont Tick was concerned were determined by a minor experiment reported a year ago. Now it is a pleasure to record that a carefully conducted experiment, carried out in the first half of the past year, has demonstrated conclusively that the species of tick in question (*Amblyomma habræum*, Koch), is an agent in the transmission of the disease. More recent works show what would rationally be expected, that the attack of the tick is normally non-infective. A few only are needed to give the disease when these come from a diseased animal, and this is true even when the interval between the ticks leaving the diseased animal and gaining access to the susceptible one is of six or eight months' duration. When the disease becomes manifest, the ticks that conveyed it may have already left, which fact explains how it is that no ticks whatever are to be found in some affected animals. Other officers of the Government have found that the disease may be communicated by blood inoculation; but to ensure death virulent blood to the amount of three or more cubic centimeters is used—an amount scores of times in excess of what is drawn by the number of ticks necessary to carry the infection simply identical to their bite. In a recent experiment five nymphal ticks (Bont) produced a fatal case. The ticks must infect through the skin, whilst blood inoculation, to be uniformly successful, must be intravenous; even ten to fifteen cubic centimeters of virulent blood injected subcutaneously, Mr. Dixon has stated to the writer, is not certain to produce the disease in over three-fourths of the animals inoculated. Such facts as these appear to indicate that the disease is due to a micro-organism in the blood which is taken up by ticks in their feeding, and in the Bont Tick at least then undergoes development in which it becomes immensely intensified in virulence; in other words, it appears that the tick is an intermediary host for the disease organism not yet discovered that causes the malady. It has not yet been shown that other species of ticks may not convey

the infection, but investigation in this direction is being pursued. The main experiment conducted during the period reported upon will be discussed at length in the second part of this report, but it may be here stated that everything learned to date concerning the transmission of the disease is hopefully indicative that the complete withholding of all sheep and goats from a given piece of veld for a period which, while still of uncertain length, is short in terms of seasons, will entirely remove the infection, although ticks in abundance remain. The fact that sheep are again being profitably farmed on some stretches of previously infected veld in the vicinity of Grahamstown lends colour to the view, and to the writer there seems reason to hope that the many hundreds of square miles of territory in the south-east of the Colony now considered useless for small stock will again be lucrative for sheep farming, and that thereby the valuation of the farms will gradually advance to what it was before heartwater became a factor with which the occupiers had to reckon. In some sections land is now considered worth only one-half of what it was formerly. Full realisation of this fascinating hope would doubtless mean drastic enforcement of harsh legislative enactments, and the years may be many before the time is ripe for such. The suggestion may be premature, but the sooner the possibility of ridding the country of the evil is broached the earlier will the public affected come to appreciate the facts that are discovered and to interest themselves in the evidence for and against co-operative effort, thus smoothing the way for legislation. Certainly no harm will have resulted from having been optimistic should some fact be hereafter brought out which renders attempted suppression of the disease in the manner intimated, temporary suspension of grazing small stock, appear an absurdity."

Altogether Mr. Lounsbury's report covers some sixty-two pages, and is amplified with several appendices, temperature charts, and plates.

Garden Notes for September.

By W. J. Bell, Florist and Seedsman.

IN both Coast and Midland Districts gardening will be fairly commenced as soon as the first rains have fallen, and nearly all kinds of vegetable seeds may now be sown without shelter, other than some kind of light litter placed over for the night as a protection from possible late frosts.

This will only be required for such tender seedlings as tomatoes, cucumbers, melons, marrows, capsicums, and egg-plants, and should be removed the following morning, and kept handy for replacing in the evenings while frost is feared.

For the earliest crop cucumbers, marrows, and melons may be raised on a hot bed, well hardened off, and planted out after the middle of this month, or as soon as danger from frosty nights is over. For a later crop the plants may be raised in a cool frame or in boxes in a sheltered place and planted out in October. After planting out they will require careful shading until established. Cucumbers should not be grown in hot, exposed situations, as they require a certain amount of shade during the whole period of growth. The soil should be kept loose by frequent hoeings, and should be mulched with a good layer of stable dung. Abundant water is necessary in dry weather.

Early tomatoes, capsicums, and egg-plants may be raised in the same way, and should be pricked out from the boxes into beds as soon as the plants are large enough to handle. Attend carefully to shading and watering till well established. The tomato plants will be large enough in a few weeks for finally planting out where they are required to be grown, when on a damp or dull day they may be taken up with a ball of soil round the roots and planted in rich soil about two feet apart in rows. The Duke of York, Crimson Cushion, Ponderosa, and Perfection are first-rate varieties, and succeed well here.

For size and flavour the Ponderosa is unequalled by any other tomato grown,

but on account of its thin skin it does not travel well, and therefore is not so suitable for market purposes. For the same reason it requires rather more shelter from heavy and continuous rains than the thicker skinned arieties.

Sow French beans, globe artichoke, asparagus, beet, cabbage, carrot, mustard and cress, endive, leek, lettuce, spring onions, radish, pumpkin, rhubarb, squash and spinach. Where tree tomatoes and Indian sorrell are required, these should be sown at once. The earliest crop of French beans should be sown in the warmest and most sheltered part of the garden; later crops may be sown in more exposed situations. Sow the seed in drills two feet apart and two inches in depth, or less in heavy soils, and four inches between the seeds. In dry weather the ground may be mulched and frequent waterings given. The best varieties are Canadian Wonder, Burpees Stringless, both green podded, and the Golden Butter, a yellow podded variety.

Globe artichokes may be sown in rows where they are to remain; thin to a foot or 18 inches apart, and transplant the following season to four feet apart each way.

Asparagus should be sown in light rich soil in rows eighteen inches apart, and when large enough thin out to nine inches in the rows. The best width for an asparagus bed is five feet, which will take three rows, one down the centre and one on each side about a foot from the edge. When planting is finished the ground should be mulched with a thick coating of good stable dung and copious waterings given in dry weather. The after-cultivation consists simply in keeping the ground clean and dressing with salt in the spring.

Cabbage is usually sown broadcast in beds, taking care not to sow the seed too thickly. When the young plants are large enough to be handled, a good plan is to transplant from the seed bed to another bed a few inches apart each way, where they will become strong, sturdy plants fit for final planting out. By this method each may be taken up with a ball of soil and be planted out without the loss of a plant.

All the root crops, such as beet, carrot, radish, and turnip should be sown in drills. The ground should be dug deep, and if manure is necessary it may be turned in with the bottom spit so as to bury it well below the surface. This will cause the top root to descend and prevent forking. Sow the seeds thinly in the drills, which should be about eighteen inches apart. When the plants are fit to handle, thin out to six inches apart for beet and carrot and a little more for turnips.

Correspondence.

To the Editor Agricultural Journal.

CHEMICAL FERTILISERS.

SIR,—In reply to Mr. Thorrold's letter in your last issue, I think the discrepancies he complains of are easy of explanation, and are caused by his not clearly comprehending the meaning of some of the terms used. The word "potash" is applied to the oxide of potassium, a substance from which all the potash salts, such as the nitrate of potash, sulphate of potash, and muriate (otherwise called chloride) of potash, may be derived. It is accordingly the usual and most convenient plan, in all fertiliser analyses, whatever salts of potash may be present, to return them as equivalent to so much potash; by this means their relative values as potash fertilisers can be seen at once. For instance:—

Sulphate of potash (pure) contains 56·3 per cent. of potash.
Muriate of potash (pure) contains 63·1 per cent. of potash.

Now in kainit the potash exists in the form of sulphate of potash; and a simple calculation, with the figures given above, will show that the 13 per cent. of potash stated in my original article is equivalent to just over 23 per cent. of sulphate of potash, and that the figures quoted by Mr. Thorrold must refer to the quantities of this latter salt contained in kainit. As to the statement *re* muriate, quoted from

Sibson's work, which I am unfortunately unacquainted with, it clearly means that commercial muriate contains 80 per cent. of pure muriate, the other 20 per cent. being impurities. This is nowadays a very low standard indeed; a first-class sample would be 98 per cent. pure. It is a chemical impossibility for muriate to contain 80 per cent. of potash.

As to Mr. Thorrold's difficulties with regard to the formulæ for fertilisers, I confess that I cannot quite follow his calculations, especially the method by which he has arrived at 20 lbs. of muriate of potash in formula No. 3. I fancy he has understood the percentages given in formula No. 2 to mean so many pounds per acre, which is quite a mistake. The percentages mean that every 100 lbs. of the mixed manure should contain 4 lbs. nitrogen, 7 lbs. phosphoric acid, and 4 to 9 lbs. of potash. If we take his figures (making an alteration in accordance with the explanation given above we find that to provide 4 lbs. potash will require $6\frac{2}{3}$, or say 7 lbs. of the muriate) the formula works out thus :—

Nitrate of soda ...	...	27 lbs.
Dissolved bones...	...	56 „
Muriate of potash	...	7 „
Total...	...	90 „

This only totals up to 90 lbs, so he must either use 90 lbs. instead of every 100 lbs. recommended, or add 10 lbs. of dry earth or similar substance to make up the full 100 lbs., which will then contain the proper percentage. But this has nothing whatever to do with the amount applied per acre; in fact, he must use about six times as much per acre to come near to the amounts proposed in his formula No. 1; the weights being then :

Nitrate of soda	...	162 lbs.	per acre
Dissolved bones		336 „	„
Muriate of potash ..		42 „	„
Total	...	540 „	„

Equal to 600 lbs. of manure made to the standard of formula No. 2. I might suggest that it would be unwise to mix the manure as suggested, as the nitrate would be acted upon by the acid in the dissolved bones, and the nitrogen wasted. He should either use sulphate of ammonia instead of the nitrate, or apply the latter as a top dressing after the crop is up.

Yours &c.,
ARCH. PEARCE.

SIR,—Regarding Mr. James Thorrold's letter in the last *Journal*, in a measure referring to Mr. Archibald Pearce's article of the previous issue entitled "Agricultural Analysis," I am glad the subject has come under discussion, as I am of opinion that too much light cannot be thrown on the question of artificial manures at the disposal of our farmers; and am glad to learn there is a desire to have a little more publicity as to their sources and composition, so that they may be tabulated, as far as possible, in such a form that intending purchasers may with some confidence select those which will suit their purpose. The matter is of sufficient vital interest to agriculturists to warrant the undertaking, and merchants dealing in artificials should have nothing to fear from such an exposure, in most cases, as it will advertise their wares for what they are worth, and give them a standing which will speak for itself. It is, however, only fair that the merchants should either voluntarily submit samples for analysis, or, that they should receive due notice from the purchaser after dispatch of the manures, that it is the intention to submit samples for analysis and publication.

Mr. Thorrold's dilemma is certainly that of many others, and it is well that such difficulties should be expressed and discussed for their own edification and that of others. In Mr. Thorrold's endeavour to point out his difficulties, he assuredly does not simplify the matter of explanation, as his reasoning has led him into rather intricate paths. In the case of kainit, Mr. Pearce states it rightly when he says that this article contains about 13 per cent. of potash and the muriate or chloride about 60 per cent. or the equivalent of 60 per cent. The misunderstanding seems to arise from a misinterpretation of the note in Messrs. Henwood & Company's handbook, where I believe it states that kainit contains nearly 25 per cent. of sulphate of potash. If that is so, then be it noted, that it is 25 per cent. of the sulphate, not of potash;

the former contains only about half its quantity of potash, viz., 54 per cent., so that the 25 per cent. of sulphate of potash is equivalent to 12·5 of potash.

Referring to the percentage formulæ of nitrogen, phosphoric acid, and potash, supplied for mixing manures to suit wheat, oats, &c., the composition does not deal with the amount of the mixture to be applied per acre, but merely states what proportion of each ingredient should be present ; any quantity may be spread per acre, so long as the formulated composition is observed, the quantity is not stated here, merely its composition ; just previous to the formulæ, quantities are given per acre, and this is followed by the prescribed recommendation as a guide by which the farmer is enabled to make up and mix manures from any material he chooses, so that they will resemble in composition that propcsed for wheat, &c.

Mr. Thorrold is somewhat astray in his interpretation of the formula. The following I have worked out to show the percentages in the manure he has deduced :—

27 lbs. nitrate of soda contains, say, 15·25 per cent. of nitrogen, equals 4·11 lbs.

56 lbs. dissolved bone contains 2 per cent. of nitrogen, equals 1·12 lbs.
16 per cent. phosphoric acid equals 8·96 lbs.

20 lbs. muriate of potash contains, say, 60 per cent. potash, equals 12 lbs.

---

103 lbs.

103 lbs. of the mixture contains 5·23 lbs. of nitrogen, or 5·07 per cent., 8·96 lbs. of phosphoric acid, or 8 70 per cent., and 12 lbs. of potash, or 11·65 per cent.

The quantity of 103 lbs., of course, is too small for a good manuring, probably four or five times that amount is necessary.

That 150 lbs. of muriate of potash is equal to 120 lbs. of the pure salt, means that in the commercial article there are impurities which reduce the percentage ; if the muriate were quite pure then it would contain the equivalent of 63 per cent. of potash ; 150 lbs. muriate contains about 90 lbs. of potash.

Yours truly,
ALEX. PARDY, F.C.S. etc.
Agricultural Chemist.

Durban, 3rd September, 1901.

REDWATER.

SIR,—Can anyone tell me if the disease known as redwater in Queensland is the same disease known as redwater in Natal ? We have redwater in England, and Texas fever in Texas, another form of redwater, and I do not think they are the same. I am asking this question, as I have heard that a lot of cattle are likely to be imported from Queensland, and we have quite enough diseases to contend against, without introducing another form of redwater.—I am, &c.,

C. L.

The P.V.S., Mr. H. Watkins-Pitchford, replies to the above :—"The redwater of Natal is the same disease as the redwater of Queensland, and the Texas fever of America. The redwater of England is quite different. The danger of introducing bovine disease by the importation of cattle from Australia I think is remote. The cattle of Australia are enviably free from disease."

The value of salt for sheep is shown by an experiment in France, where of three lots of animals fed alike on hay, straw, potatoes, and beans for 124 days, one lot had no salt, one had ½oz. of salt each every day, and the other had three-fourths of an ounce. Those that had ½oz. gained 4½lbs. each more than those that had no salt, and 1¼lb. more than those which had more than a ½oz. So it seems that too much salt can be given as well as too little. The salted sheep had 1¾lb. more of wool and a better fleece than those that had no salt, showing better results in the wool; that is, larger profit than in the flesh.

What is regarded as a great advance in the sterilised milk trade is recorded by the "Journal d'Agriculture Pratique." The French National Society of Agriculture received recently a bottle of milk which had been sterilised for some months, and it was observed that there was no rise of cream to the higher part of the bottle, which was one of the chief objections to ordinary methods for sterilisation of milk. When milk is sterilised by being heated to boiling point or above, this treatment does not prevent the cream from rising, and later, when it is to be employed, the cream must be mixed with the rest of the liquid, though, as a rule, the said cream is transformed into butter by shaking. The happy idea of re-emulsionising the sterilised milk by subjecting it to a pressure of 250 atmospheres, which pulverises the fatty globules, was hit upon. It has been observed that their diameter became less than thirty-nine-millionths of an inch, and that, finally, the globules cease to collect in the form of cream on the surface.

Meteorological Returns.

Meteorological Observations taken at Private Stations for Month of August, 1901.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1901.	Total for same per'd from July 1st, 1900.
	Maximum.	Minimum.					Fall.	Day.		
Estcourt	...	...	80	28	1·42	3	·68	24th	1·45	2·22
Nottingham Road ...	...	...	.	...	2·54	5	1·12	24th	2·04	...
Adamshurst		...	7.)	41	1 48	2	1 5	25th	1·48	...
Hilton	...	...	86	37	1 98	4	1·28	24th	1·98	1·84
Ixopo (Gerton) ...	...	...	89	46	69	2	·37	25th	.64	1·07
Mid Illovo (Ismont)...		..	75	43	1·69	6	·67	24 th	2,98	2·56
Ottawa	...	..	...	...	2·04	6	·75	13th	2·07	2·60
Mount Edgecombe ...	...	...	99	52	2·70	5	1·13	18th	2 73	3 41
Cornubia	...		...	...	2 53	...	...	...	2 54	4·54
Milkwood Kraal ...	...	...	..	...	1·81	...			1 81	2·15
Blackburn	...	...	..	...	1 93	...	...	..	1 93	3·26
Saccharine	...	...	...	...	2·47	...	...	...	2·47	3 14
Prospect Hall... ...	...	...	...	...	3·07	...	..	...	3·07	...
Clairmont	...	...	...	...	2 87	5	1·83	13th	2·87	
Equeefa	...	...	102	52	1 82	6	·75	13th	2 26	2·06
Umzinto (Beneva) ...	...	...	.	..	1·73	5	65	12th	2 21	...

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of August, 1901 :—

Name of Colliery.	Labour Employed. Above Ground.			Below Ground.			Coal raised.	
	E.	N.	I.	E.	N.	I.	tons.	cwt.
Natal Navigation	*16	20	150	10	255	149	10,193	0
Elands Laagte	11	24	130	11	155	276	9,156	0
Dundee Coal Coy.	13	24	101	12	168	302	8,627	0
Natal Marine	11	139	20	7	322	4	8,512	4
St. George's	11	87	19	5	163	1	5,255	0
Natal Steam Coal	4	51	9	2	96	2	2,008	0
No. 42	8	30	12	3	62	0	1 549	0
Newcastle	4	17	13	4	116	0	1,531	0
Crown	12	45	4	4	112	2	1,447	0
Dudley	5	35	2	1	19	0	781	0
Inkunzi	2	12	0	1	46	0	616	7
West Lennoxton	1	2	12	1	10	24	505	7
Hillside Colliery	0	8	0	1	6	0	60	8
Central	14	84	3	1	10	0	12	0
Total	112	578	475	63	1,540	751	50,353	6

*In addition to the above, two Europeans and 17 Indians were employed on the new construction during the month.

Mines Office,
September 5th, 1901.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of August, 1901 :—

	tons.	cwt.
*Coal Bunkered	*23,531	13
Coal exported to Cape Colony	3,495	0
,, Beira	292	13
Total shipped	27,319	6

*Included in this item are 2,242 tons 1 cwt. of Imported Coal.

Custom House, Durban, 31st August, 1901.

GEO. MAYSTON,
Collector of Customs.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write :—There is nothing of importance to report since our last. Although prices in most lines have remained unchanged, there seems an indication of a rise in mealies. This may be attributed to the fact that enquiries are being made from the Rand. There is, however, but very little beyond enquiries, as very little at present has been put through. Rain fell in some parts of the colony last week, and to-day, the 10th, we are experiencing a steady downpour. This will have a beneficial effect all round, and farmers will be able to commence early operations on their land.

Mealies.—The average price for good white grain has been about 11s. to 11s. 6d. per muid, including sack.

Hay.—From 1s. 2d. to 3s. 4d. per 100 lbs.; bedding, 6s. to 32s. per load.

Potatoes.—Good tubers are now very scarce, and if imported varieties were not forthcoming, the demand would be far in excess of the supply. Fortunately, some good samples of Australian are offered almost every day. Prices all round vary from 8s. 9d. to 13s. for some samples; others go to 18s. and 23s. 9d. per 100 lbs. Sweet potatoes from 1s. 9d. to 5s. 6d per sack.

Mabele.—From 6s. to 10s. 6d. per 100 lbs.

Beans.—From 4s. 9d. to 19s. 6d. per 100 lbs.

Pumpkins.—While some samples have been as low as 1s. 6d. to 3s. 6d. per dozen, others have reached 6s. 6d. to 7s. 9d. per dozen.

Tobacco.—From 10d. to 2s. per lb.

Onions.—Although more plentiful, still rule between 21s. and 25s. per 100 lbs.

Butter.—Prices vary according to quality; while some samples are as low as 9d., 1s., and 1s. 1d. per lb., others reach 1s. 8d., 1s. 10d., 2s., and 2s. 3d per lb.

Eggs.—From 11d. to 2s. 3d. per dozen. The market has been better supplied of late.

Poultry.—Common fowls from 2s. 2l. to 4s. 10d. each; ducks, 6s. 6d. to 11s. per pair; turkeys, 12s. to 15s. 9d. each.

Sundries.—Mutton, from 5d. to 10½d. per lb.; pork, 3½d. to 7½d. per lb.; beef, 4d. to 5d. per lb.; bacon, 6d. to 8½d. per lb.; ham, 9d. to 1s. 1d. per lb. During the past fortnight fish has been sold on several occasions.

Fruit.—Apples, bananas, lemons, loquats, naartjes, oranges, and pineapples have been disposed of each morning.

Vegetables.—Beetroot, cabbage, celery, cauliflowers, carrots, lettuce, etc., etc., sold regularly.

Firewood.—From 3d. to 11d. per 100 lbs.

DURBAN.—Mr W. H. Edmonds, Box 44, writes :—

General.—Business continues brisk, and the volume of transit trade is the most gratifying feature of the improvement in matters commercial.

Mealies.—This staple shows a marked advance, and farmers now obtain as high as 12s., bag, sacks inclusive, though the coast product does not fetch as much as this by at least a shilling per muid. The crop is unquestionably a record—vide Mr. T. Hyslop's annual address to the Howick Farmers' Association—and the surplus over and above the colony's requirements will amount to several hundred thousand bags. Any material advance, therefore, will entirely depend on the amount of outside demand. Cape buyers are daily asking for quotations, but hitherto no business has resulted, which would seem to point to the fact that our prices are scarcely tempting enough. Fair quantities are, however, going forward to the Transvaal.

Potatoes.—Imports now solely supply the demand, which is assuming very large proportions. Over one thousand tons of Australian potatoes have been disposed of locally during the last few weeks, and to-day the market is practically bare of supplies. It is to be hoped farmers will take full advantage of the immense market ready to their hands and plant every acre it is possible to get in during this spring.

Oats.—There is some enquiry for seed oats for spring planting, and farmers will probably be well advised in sowing, if only a few bags. Rust appears to be slowly dying out as regards winter crops in some districts, and many farmers who had the courage to plant last autumn are now reaping good crops. Algerian and Tartarian are the best varieties for spring planting, and supplies are now available locally. Price is about 9s. 6d. per 100 lbs. in bond. The Customs authorities refuse to pass seed oats free, unless accompanied by a certificate from the farmer desiring such seed. Failing this a duty of 2s. per 100 lbs. is imposed.

J. RAW & CO.'S STOCK SALES.

The Howick Farmers' Association held their Quarterly Stock Fair at Howick on Thursday, the 5th instant. There was a fair amount of stock forward, and prices were good. Mr. R. H. Raw was the auctioneer. The amount of the sale realised £720. The following are the prices realised :—Fat and trek oxen £10, £26 5s., £20, £23 10s., £14 10s., £16, £20 10s., £25 10s., £24 10s., £17 10s. per head; one bull £20; cows £15, £14 5s., and £12 10s. per head; wethers 23s. each.

A large number of cattle were forward at City Tattersall's Market Square, on Saturday last, when about 50 to 60 head of fat and slaughter oxen changed hands at the following prices :— £19 10s., £23 10s., £11, £21 15s., £22, £20, £15 10s., £24 5s., £23 15s., £23, £22 15s.

The Agricultural Journal

AND MINING RECORD.

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CONTENTS.

South African Horsesickness.

By A. THEILER, Veterinarian to the late South African Republic.

AS stated in the first instalment, I shall now give the views of my colleague, Mr. A. Theiler, upon this subject. The coincidence of the main idea is noticeable, when it is understood that the two articles on the disease were written quite independently, and without collaboration. —H. W-P.

Who does not know horsesickness? And yet there is so much conflicting evidence upon this subject, that every farmer has, more or less, his own ideas about it. Nevertheless, certain experiences of old, every year renewed, always bring out the same facts, according to which the prevention of the disease is dealt with. These facts I wish to repeat here, in order to explain them from a new point of view, based on experiments, lasting over several years, and still carried on.

Horsesickness is a disease of horses and mules in certain countries of South Africa. These countries have, to a certain extent, the same characteristics in tallurical and climatic respects, the principal ones being warmth and moisture. High-lying tracts of country do not know the disease,

although it may happen that, in extremely bad seasons, the scourge may make its appearance even there. The disease occurs as an epidemic only at certain periods of the year, but occasional cases may also be seen the whole year through in a bad District. The horsesickness season for the Transvaal are the months from January until May ; especially the three months, February, March, and April. Bad years change with good years. The former ones have again a certain conformity, and are characterised by much rain in the beginning of the year, followed by extreme warmth. Again, when all circumstances for the development of the disease are present, certain conditions are wanted to infect a horse. These circumstances are very much discussed, yet the practical outcome is, to keep horses stabled and not to let them go out before sunrise and after sunset. Stabling does, to a very large extent, give immunity against the disease, though it may often fail. Within an unhealthy district there are still spots and places known to be more dangerous than others, namely, near rivers and marsh lands. The disease disappears more or less of a sudden with the first frosts.

The farmers know two forms of horsesickness, which classification is sufficient for the purpose. These forms are dunkop and dikkop. They are only different forms of one and the same cause ; the first one bearing especially on the lungs, the second one at the heart, the swollen head being only a secondary symptom. We always can produce, artificially, horsesickness with blood or any other morbid matter of a diseased horse by subcutaneous injection. One and the same virus may produce, in one instance, the "dunkop," and in another instance the "dikkop." Out of many experiments, I came to the conclusion that the different forms of horsesickness are only the result of the different resistance of the animal tissue. Horsesickness may run so rapidly that death follows apoplectically ; or distinct lung troubles are present for a certain time ; or swellings appear on the head, and the animal becomes very weak. In the first case the poison, produced by the pathogenic micro-organism, attacks the whole system from the very start, and does not come to pronounced symptoms ; in the second instance the lungs are the weaker organs, and in case these are strong enough to stand the attack, then the heart fails. The effusive swellings are very likely the result of the altered blood-vessels, which let part of the blood aransudate. Following this line of development, we understand that dikkop lasts, as a rule, longer than dunkop, and and that dikkop, so to say, never will end with dunkop, but *vice versa* dunkop either ends as such, or with dikkop. Of course mixed forms may appear where the symptoms of dun and dikkop are present at the same time.

I said that blood and any morbid matter of a horsesickness horse are virulent, and invariably produce the disease in a susceptible horse. The incubation time varies very much. As a rule eight to twelve days after infection the first symptoms may appear, but very often I have seen them coming only from the fifteenth to the twenty-fifth day, and even as late as on the thirty-fifth day.

This will explain how difficult it is to mark the time when a certain horse did become infected. Although the blood of a sick horse is invariably virulent, there is no possibility whatever of demonstrating the micro-organisms, either by microscope or by culture. They are so small that they pass through a Chamberland's porcelain filter, where no visible microbe passes. As Mr. Macfadean, of London, points out, it is not likely that, for such a small thing, a sufficiently magnifying power ever will be constructed.

The following facts are borne out by experiments :—

Horsesickness blood keeps its virulency for at least fourteen months, when in liquid state, but loses it when dried. As little as twelve hours in the shade is sufficient to kill the micro-organism when the blood is dry. The virulency is not suspended when the blood becomes quite putrefactive. Virulent blood, kept for many months in ice, does not lose its infective power when liquid. It is possible to produce the disease with as little virulent blood as one-thousandth part of one ccm. by subcutaneous injection, although the individual disposition and resistance of a horse can vary very much

in this regard; whereas I always failed to produce the disease by ingestion when I used less than 200 ccm.

These facts, compared with the general observations, will explain why rivers and other damp places are dangerous; it does not, however, bear out the general idea that dew is the carrier of the morbid cause, because it is impossible to understand, firstly, how the virus can come there at all, resisting sun and heat; and, secondly, in such enormous large quantities as are necessary to make up a sufficiently mortal dose when taken through the animal's mouth.

To explain how the disease is taken by an animal, and how it is disseminated, we have to form a theory. Experiments have not gone so far yet as to prove it. The fact that it only needs a very small quantity to infect a horse through the skin on the one hand, and the comparatively large quantity which is necessary to infect a horse through the mouth on the other hand, point out that natural infection very likely will go through the skin. But how? Very possibly through the bite or puncture of some blood-sucking insect, as it is the case, for example, in the Tsetse disease, so clearly explained by the classical work of Colonel Bruce, R.A.M.C. The acceptation of the blood-sucking insect theory explains everything with regard to dissemination of horsesickness. It explains why the disease is in certain low-lying parts of the country, and not in the heights, but that it can go there; that it disappears from one place, and comes back again. The same is the case with the tsetse fly. We understand now why horsesickness is arrested, and finally dies out with the first frosts. Seeing that the ice box does not kill the virulency of the blood, we know, by daily experience, how the cold kills all sorts of flies and insects. Our supposed insect flies very likely only during certain times, and under special conditions. From Zoological history, we find that some insects appear only at stated periods of the year, and during certain times of the day. One year the insects may be much more prevalent than another, according to more favourable conditions necessary to their growth, like the mosquito, for instance. So we can understand why the disease is rather scarce in stable-kept horses, and how a horse which never comes outside, and is always fed on dried forage, is still liable to contract the disease.

We also can explain why horsesickness is only in one particular season of the year, although virus in a wet state is virulent for at least fourteen months.

Now it must be understood that I do not think that every individual of this particular insect does carry the disease, neither that every bite of an insect, carrying disease, produces it. Very much depends on the disposition of the horse, and very likely from the number of the bites an exposed horse receives. For the one horse one single bite may be sufficient, another one may withstand hundreds.

I cannot yet form an idea how the virus is getting, in the first instance, into the insect, although, in a later state, simple inoculation from one animal to another by the insect is possible. The fact that virus, in a wet state, keeps considerably over a year, and the fact that most blood-sucking insects, like mosquitoes, breed in damp, moist places, point to some connection between the two.

I wish to point out that I do not bring any new theory with regard to these blood-sucking insects as carriers of a disease. They have been proved to be the disseminators of human malaria, and the mosquito, especially, depends in its development and dissemination very much from the same conditions as are known in South Africa to produce horsesickness.

The evidence brought forward to explain all about horsesickness has ceriainly everything in favour of the blood-sucking insect. Moreover, it upholds all effectual means known as a preventive against the disease, and suggests, better than any other theory, new ways of successful treatment where a horse, necessarily, has to be exposed to the infection. This would be the protection of the skin by covering it in some way or another, or as it is done against gadflies in other countries, by rubbing or smearing such insecticide or strong smelling stuff on the skin. The right one will have to be found. There are, as it is well known, many medicines in favour as preventives. Their effectiveness might also find an explanation in the above way. As the whole is given as a theory, based on ex-

perimental facts, well to understand, I leave it over to every farmer to act accordingly, and carry it into practice as he likes. I would further suggest that farmers give their attention to any particular insect observed in a horsesickness country, and contribute the experience they might derive from the foregoing conclusions.

Quarter-Evil.

By H. Watkins-Pitchford, F.R.C.V.S., P.V.S.

THE advance of the season brings before us the recurring necessity of taking steps against this fatal stock disease, which probably destroys more lives throughout a year of average mortality than other stock diseases combined.

Experience points to the fact that a bi-annual inoculation say in August and January) will give more uniformly successful results than where dependence is placed upon a single spring or summer operation.

The degrees of susceptibility to this disease are, as in most diseases, varying, and the immunity acquired in highly susceptible animals seems barely sufficient to ensure freedom from risk for twelve months.

It is encouraging to note the advantage which is being taken of the quarter-evil preparation by the Natal farmer. Since its issue from the Laboratory, more than 15,500 doses have been sent out, and during the present year alone a greater number of doses has been issued than during the whole of last year (6,855 as against 6,665 last year).

No casualties have been reported, and but few cases of death have subsequently occurred among inoculated stock.

These deaths, few as they have been, may possibly have been due to the excessive susceptibility as spoken of above, or as is more possible, they may have occurred through slight inadvertence in the simple process of inoculation. It must be continually borne in mind in inoculating, that the syringe must be shaken immediately before every injection which is made, as the tendency of the preparation to precipitate or sink rapidly often results in one animal receiving a small dose of water only, while the next receives a double dose. In this way most of the deaths occurring amongst stock supposed to have been inoculated may be accounted for.

I would urge all farmers who have not yet taken this simple and safe precaution to inoculate at once before the season becomes more advanced. The saving of even a single beast will more than repay the slight expense and trouble incurred, especially at the present price of young stock.

Grass Seed for Distribution.

A FURTHER consignment of fifty pounds of *paspalum dilatatum* has been received, and is available, on application, for free distribution in small quantities.

Fifty pounds of *Danthonia semi-annularis* has also been received, and is similarly available for distribution. This is one of the indigenous grasses of New Zealand. The following is extracted from an Annual Report of the New Zealand Department of Agriculture: — "*Danthonia semi-annularis*, and its varieties, are justly claiming great attention, the

demand for these seeds being far beyond the supply. This manifestation of favour is most gratifying, for, with fescue, it promises to change our disparaged lands in the north from their reputed barrenness, for on such lands this and other native grasses are rapidly replacing exotic species. In many districts there are now indigenous grass pasturages, and at last farmers are beginning to believe that the time-honoured practice of reploughing every three or four years may be no longer necessary."

Irrigation.

IN the next issue will be reproduced a report by Colonel Corbett, the Irrigation Expert, on "The position and prospects of Irrigation in Natal."

District Reports.

BULWER, 19th September.—There was more rain last fortnight. On the 10th it was a soaking wet day, remarkable for its warmth, there being no cold winds accompanying it, though the Berg was well covered with snow. Rain also fell on the 13th, 14th and 15th instant, but this was accompanied by cutting cold winds. To-day we are having a gentle drizzle. The soil is now thoroughly soaked, and farmers and natives are busy ploughing and picking. While on Branch Court duty the other day I was surprised to find the grass so backward in some parts of the Division. All round Bulwer and the Umkomazana District there is abundance of young grass for all kinds of stock, but elsewhere it is only just beginning to spring, and it will be some weeks before there is a plentiful supply. Ewes are lambing down fast, and judging from the quantity of lambs running with the ewes from a casual observance, the percentage will be good. The stock sale held on the 13th instant at Bulwer by Mr. J. Finlay Alexander did not prove very successful It rained all day, which prevented many buyers from attending. Stock to the amount of £108 was sold. Prices ruled very much lower than expected. Bulls sold for £14 and £15 per head; cows from £12 to £14 per head; oxen £16 per head. One fine lot of slaughter oxen failed to reach the reserve of £24 per head. Most of the stock was in poor condition, which, probably, had a good deal to do with the low prices. The serious outbreak of rinderpest in East Griqualand, though a considerable distance from the borders of this division, is giving considerable anxiety to the farmers in the Division. The border is now well guarded to prevent the entrance of horned cattle from the infected areas in terms of the proclamation which appeared in the *Government Gazette* on the 10th instant. The border fence between Natal and the Cape Colony, I understand, is still in good order, and will be of considerable assistance in preventing cattle being brought through from East Griqualand to this Division. Many herds of cattle escaped the rinderpest plague in this Division when the disease passed through the Colony, and I am afraid if we have a second visitation of the plague these herds may be the first to suffer. There have been no more fresh cases of lungsickness on the farm Fairacres, of Miller Bros., but the herd is not free of the disease. There are still several lungers, so called, in the herds, and the quarantine has been further extended. All other kinds of stock, as far as I know, are free from disease.

H. W. Boast, Magistrate.

HOWICK, 24th September.—During the last fortnight the north winds have not been so prevalent, but it has been very cold, with rain falling on 10 days out of the 14, with the result that during that period 2·83 inches of rain fell, the maximum temperature being 87, and the minimum 38 degrees. On the night of the 19th instant there was a fall of snow on the hills near the Dargle, with the result that many lambs died from the effects of the cold. There is now sufficient green grass for all classes of stock, and such an early spring has not been experienced for many years. Farmers are now preparing their lands for planting. A large swarm of locusts visited Howick lately, but passed on without doing any damage.

J. W. Cross, Magistrate.

IXOPO, 12th September. — Welcome rains have recently fallen, and the grass now looks lovely and green, and cultivation has started. Sheep-stealing, I regret to say, seems on the increase, and there are about ten natives in gaol awaiting trial upon the charges of sheep or goat-stealing, and they will be dealt with by a Judge of the Native High Court on the 20th instant. On the 28th instant the farmers hold a meeting to nominate a civil detective, and it is to be hoped that the gentleman selected will be as successful in detecting thieves as Messrs. D. Hulley and Gold are in East Griqualand.

Frank E. Foxon, Magistrate.

NDWANDWE, 12th September.—Rain fell during August on two separate dates, giving a total fall of 2·32 inches, and this has brought the grass on so as to afford splendid feed for all kinds of stock. Lungsickness still exists in several parts of my District, but, owing to precautions taken, has not spread from the scene of the first outbreaks, which were traceable, in nearly every instance, to cattle looted from the enemy in the Vryheid District, and sold or paid

to natives. With the exception of these cases, stock throughout the District is in a healthy condition. I am glad to say that an experienced man has been appointed as Stock Inspector for the northern portion of the Province, and, although he has a vast tract of country under his care, his services will very materially assist in the prevention of the spread of disease amongst stock. Two vast swarms of locusts visited my District during August, travelling in an easterly direction.

A. W. LESLIE, Magistrate.

PORT SHEPSTONE, 23rd September.—The total rainfall for the past fortnight has been 10.37 inches, the heaviest fall on one day being 3.01 inches on the 14th instant. On the 8th instant we had a very hot wind, which sent the temperature up to 98 degrees. Ploughing operations amongst the natives are now in full swing. I was very much surprised to ascertain, at a store where I was holding a Branch Court lately, what a number of ploughs the natives are buying. They appear to have a good number of cattle left for ploughing It appears to me that this early ploughing down here is attended with great risk, as locusts will appear just about the time that the mealies are well advanced. The Europeans put in their crops usually about Christmas, or during January. We have at present four spans of oxen quarantined under the Lungsickness Act. The disease was brought into the District from East Griqualand. It broke out in a span of oxen belonging to a Mr. Thompson. The majority of these oxen have died. It has since made its appearance amongst another span that came in contact with Mr. Thompson's. With the strict quarantine that is being observed, it is hoped that the disease will not spread beyond the quarantine area.

P. HUGO, Magistrate.

UMLALAZI, 21st September.—I regret to say there have been three fresh outbreaks of lungsickness amongst cattle in the District since my last report, one in a large herd belonging to surrendered Boers, and two among natives' cattle. No fresh cases of anthrax have been observed. Natives are everywhere busy ploughing or hoeing and planting. A dense swarm of locusts passed through the District on the 2nd instant, travelling north, over the Ongoye Range of hills. We have had heavy, almost torrential, rains, during the last fortnight no less than 6½ inches having been registered. Many usually insignificant streams have been impassable for a day or two, but are now rapidly falling, the rain having ceased.

J. J. JACKSON, Magistrate.

WEENEN, 20th September.—Spring has been well ushered in with two or three days of rain which has left its beneficent mark on trees and veld. Orchards are a mass of pink and white, and hills of brown and black are now being rapidly transformed to green. Farmers, ever doubtful of nature's goods, enquire dubiously if this promise of better things will be fulfilled, and, indeed, past experience warrants their doubt. But in the meantime nature is rejoicing in her new life, and bears the appearance of having had a bath and general clean up. Some very hot days have been experienced, and the thermometer has registered as much as 95 degs. lately, a high temperature for early spring. Last month's meteorological records show a greater variation at this station between the maximum and minimum means than is evidenced in any other District. A suspected case of lungsickness is reported on the farm Vrisgewaagt near the village. The outbreak in the location was supposed to have died out, but after the lapse of nearly two months, another beast has sickened. Farmers would seem to be unanimous in agreeing that the period of six weeks defined by the Act is too short, and this is the second instance in this Division where their contention has apparently been justified.

C. G. JACKSON, Acting Magistrate.

Naartje Growing in the Midlands.

INTERVIEW WITH MR. R. H. PEPWORTH.

(BY ERGATES).

MEETING, a few days ago in Maritzburg, Mr. R. H. Pepworth, or Mr. Harwin Pepworth, as he is better known, he was good enough to invite me to go out to his place and see the magnificent crops of naartjes his trees were bearing. I accepted with pleasure, and said I would take a photograph of one of the trees, which would probably be published in a future issue of the *Journal*.

The farm lies up the Zwaartkop Valley, about a couple of miles beyond the Botanical Gardens. Originally, in 1857, it was bought by the late Mr. Henry Pepworth as a suburban place of residence, and in 1891 it was occupied by Mr. Harwin Pepworth for farming the land. Mr. Pepworth's farming may be roughly described as fruit and wattle growing and market gardening. His wattle-bark, in 1899, took the special medal of the Durban Show, and his potatoes have carried off several "Firsts." For forage (Sidonian) he has taken Firsts, and with his bee exhibits he has always been in the front rank.

To see the naartje trees had been my object, and with their excellent appearance I was impressed. The trees bore exceptionally fine-looking fruit, and the branches were so heaviiy laden as to require propping. The trees were clean, and in the most vigorous state of health. Here are some of the answers I received in reply to my questions.

"Yes; the trees are. all grafted; the grafted, instead of being weaker than seedlings, as some growers contend, are, in my opinion, formed by reading of the results in other countries, and by my own observation, stronger. There are grafted naartjes here twenty-five years old, and showing no signs of decay. Then, with grafted trees, you can rely upon getting fruit true to its class, which you cannot with seedlings. The few seedlings which I have I am going to root out immedimediately. For two years they have made no progress. On the other hand look at those young grafted trees; look how vigorous they are, and see what a lot of new growth they are putting out. They come from Mr. Todd, of the Town Bush Valley. I water the trees as soon as the fruit begins to ripen. The water comes by pipe from a small spring near the Zwaartkop Station. The split bamboos, with the partitions knocked out, make, as you see, capital conduits for the water to the different trees. I cannot afford to waste any water. As to pruning I do but very little, and all over the world it is getting recognised that the citrus class of tree requires but little of this attention. In the middle of the trees I cut out some of the wood so as to give better access to the air and light, and I prune back at the top a little so as to keep the tree from straggling up too high, and making its fruit difficult to get at. It is a great thing to have your naartjes get-at-able, because each fruit should be carefully severed by cutting, leaving a small bit of the twig attached. The keeping of the orchard clean is most important. Every third year I give each tree 15lbs. of bone dust. By-the-bye, it is strange that the bone millers will no longer supply their dust in three grades of fineness. I sift mine into the three formerly supplied grades, the coarsest, and consequently the least active, going to the fruit trees. Yes; into those pits the fallen fruit is thrown, practically every day. Mr. Fuller, the Departmental Entomologist strongly advised me to do so, and although there are neglected orchards in the neighbourhood, the benefit in keeping down the fly has been most marked. In selling the fruit it is almost impossible to take too much care in the packing and grading. The get-up goes a long way in fetching big prices."

"How does naartje growing pay?"

"Capitally. You see we are a month later than on the coast—the great naartje district of the Colony. Here are a few examples of sales:—At the Maritzburg market, 5s. for 48 of top class; 4s. 9d. for 80 of medium class. On the Durban market in September, 1898, I got £1 1s. 6d. for 100 selected naartjes. The following year, immediately after my first consignment of the season was sold on the Durban market, and before I had heard the result from the market-master, an agent arrived here and contracted to take all my naartjes at 6s. per 100 on the trees. He was a smart man. I shall not forget the lesson."

"And about fumigation: I see you do it yourself?"

"Certainly. I bought the tents, etc., through Mr. Fuller, and under his instructions I learnt how the operation was done—which is indeed simple enough. I would not now, on any account, be without a fumigating plant. The cost of the chemicals for fumigating a small tree is about 2d, and for a big tree about 6d. The tents for the big trees cost £6 10s."

Faugh-a-Ballagh, as the farm is called, is interesting for its trees, many of the specimens being about forty years old. Of course there are plenty of the blue gum, that, of late, is being spoken of so disrespectfully. As a timber tree Mr. Pepworth has nothing to say in its favour. The Ficus indica, Rostrata, Stuartina, Australian Oak or Grevillea robusta, Oyster-bay Pine, and several others are represented. From wood of the Grevillea robusta, grown on the farm, Mr. Pepworth has had a writing desk made. The grain of the wood is beautiful, and the polish the wood takes is perfect. It was made by Mr. Reid, of Marit burg, the cabinetmaker. Remembering the strong contracting and expanding tendencies, according to the seasons, of some yellow-

wood furniture, which I patriotically had made for myself, I asked Mr. Pepworth about the nature of the Grevilla robusta in those respects. The timber of the adopted tree, he affirmed, was perfect—it never shrank, however hot and dry the weather might be, and it never swelled in rainy. The tree which had supplied the wood was twenty years old, and the trunk was 20 inches thick. Referring to the difficulty in getting trees determined, Mr. Pepworth mentioned that, through ignorance at the time, he cut down a lot of Marginata for selling as mining props at the common price of such poles. In a short time Mr. Pepworth hopes to plant out 3,000 of the Eucalyptus Paniculata, the common Ironbark Marginata, the Jarrah wood Amygdalina, and Diversicolor or Karri tree of Western Australia. He is a firm believer in the planting of Australian gums for profit.

Here, at Faugh-a-Ballagh, were all the charms and interests of country life within but half-an-hour's canter from Maritzburg. It was a fact I found difficult to realise.

The British Milk Standard.

THE regulations made by the Board of Agriculture for the sale of milk extend to the whole of Great Britain, and came into operation on September 1st. Below are the regulations, from which it will be seen that they provide that milk containing less than three per cent. of milk fat shall be presumed for the purposes of the Food and Drugs Act not genuine, by reason of the abstraction of fat or the addition of water. Milk containing less than 8·5 per cent. of milk solids, other than milk fat, shall be presumed not genuine by reason of the abstraction of milk solids other than milk fat, or the addition of water. The two foregoing regulations do not apply to milk sold as skimmed, separated or condensed milk. The third, which deals with skimmed or separated milk, not being condensed milk, provides that a sample containing less than nine per cent. of milk solids shall be presumed not genuine by reason of the abstraction of milk solids other than milk fat, or the addition of water.

The following is a full text of the regulations :—

MILK.

(1) Where a sample of milk (not being milk sold as skimmed, or separated, or condensed, milk) contains less than three per cent. of milk fat, it shall be presumed, for the purposes of the Sale of Food and Drugs Acts, 1875 to 1899, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk fat, or the addition thereto of water.

(2) Where a sample of milk (not being milk sold as skimmed, or separated, or condensed milk) contains less than 8·5 per cent. of milk solids other than milk fat, it shall be presumed, for the purposes of the Sale of Food and Drugs Act, 1875 to 1899, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk solids other than milk fat, or the addition thereto of water.

SKIMMED OR SEPARATED MILK.

(3) Where a sample of skimmed or separated milk (not being condensed milk) contains less than 9 per cent. of milk solids, it shall be presumed, for the purposes of the Sale of Food and Drugs Acts, 1875 to 1899, until the contrary is proved, that the milk is not genuine, by reason of the abstraction therefrom of milk solids other than milk fat, or the addition thereto of water.

A good horse, like a good house, is built "from the ground up," the superstructure of the future horse being formed in the weaning colt. He who takes the best care of his growing colts always has the best mature horses. Too many are content to let their weaners "root hog or die" practically seeming to think that a paddock of dry grass is quite good enough for the foals. This is a grave mistake. A young and growing animal of any class requires something more than mere "filling." It must have nutritious, tissue-building, and blood-making food. It is a good deal easier to put two years' growth on a colt the first year of its age, than it is to "make up" for a year's loss of growth in two or three years A good growth the first year of a colt's life costs less than at any other age, but is twice as valuable to the breeder a fact that is too often ignored.

A Chat with Mr. Anthony Wilkinson.

SUGAR, LOCUSTS, AND FORESTRY.

(By Ergates).

MR. ANTHONY WILKINSON'S name is well known throughout Natal and beyond. Not only is Mr. Wilkinson a well known and successful colonist, but he is also recognised as one who, by communications to the Press, and by other means, is actively desirous to forward the agricultural interests of the Colony. His father was a shipowner, and Mr. Anthony Wilkinson, provided with a good lieutenant, at the age of nineteen was in command of one of his father's ships. But the seafaring life palled after ten years. He went to Illinois and began farming. He gave it up for two reasons : firstly, labour difficulties ; and, secondly, because he was medically informed that the malaria of the District had got into his system, and that it would be necessary for him to get a complete change of climate. After some time in England he resolved to go and look up a brother who was in Natal. This brother subsequently joined the late Mr. James Raw in partnership. The immense business of the firm transacted in Bills will be remembered by all old colonists. It was a miniature South Sea Bubble. On Mr. Anthony Wilkinson's voyage out to the Cape, as a passenger in the *Windermere*, the sailors mutinied, and the ship's officers were so severely handled that they were unable to navigate the ship. This was done by Mr. Wilkinson. After looking round Natal, Mr. Wilkinson settled where he now is. The year was 1856. He paid 6s. 8d. per acre : now the land in his neighbourhood ranges in value between £12 and £20 per acre. At first he thought he would try sheep, then he inclined towards coffee, but the sight of a splendid crop of sugar-cane at Isipingo determined him to go in for sugar.

The Mill.

In 1858 he put up his first mill—one worked by cattle. In 1860 he erected a steam-power mill and a still. A very full account of the process of sugar refining having already appeared in the *Journal* (the Natal Estates refinery at the South Coast Junction), I shall touch only on the points which most attracted my notice. The firing of the boilers was, perhaps, the most noteworthy feature. The megass goes direct from the rollers to the furnaces, which might be described as brick passages, about 12 feet long, leading to the boilers. The composition of green megass as it leaves the rollers is about 51 parts of water, and 49 parts of woody fibre and sugar. The furnace is fed with the green megass and atmospheric air, previously heated in a chamber to a temperature of 200 to 250 degrees by the gasses escaping to the chimney. The fire in the first instance is started with some dry fuel and coal, and a little coal is fed at intervals to maintain the heat of furnace to an orange colour, or 2,000 to 2,200 degrees during the day. The water, which is half the weight of fuel, is decomposed, contains the right proportions of hydrogen and oxygen to burn fiercely, the woody fibre and sugar of course burning easily. All the gases are consumed by the time they leave the furnace, and are then ready to come in contact with the boiler or other condensing surfaces. The old-fashioned way, which is still mostly in vogue in Natal, is to dry the megass in the sun, and when the sun is absent, to stack it in sheds, and skin the outer surfaces as the mass becomes dry, which entails a lot of labour, and finally it is fed into furnaces too low in temperature to decompose the water. By fermentation the megass also loses the residue of sugar it contained—a very inflammable constituent. The economy is not only in fuel but in labour, for, by this system, there is only light work for one Indian, whereas by the common method there would be exhausting work for three men. One of the best indications of only partial combustion is smoke, and of smoke I saw hardly a sign while at the mill. The system was invented, and has been patented, by Mr. Wilkinson's son, Mr. Gilbert Wilkinson. Here, for the first time, I saw the Yaryan evaporator. There are only three in Natal. The

Yaryan accomplishes in twelve minutes what in other evaporators takes from two to three hours. The cleaning of most evaporators is a big business, but that of the Yaryan is simple and easy. The distillery was at work, and none of its produce, teetotallers will be pleased to hear, was intended for sale as drinkable spirits. The demand for methylated spirits at the present moment is exceptional, and all the spirit from the still is made nauseous with the officially prescribed proportion of naphtha before leaving the premises.

Sugar Prospects.

"How about the prospects for sugar?"

"The prospects are fair. The golden days of the industry were at the end of the seventies, when sugar was £28 per ton, and the rainfall was good, and the wages were only half what they now are."

"Will it be possible, in the early future, to dispense with the protective duty?"

"No; not while Continental nations protect the beet industry with bounties. Sugar planters of late years have had a good many drawbacks to contend against. At present there is a scramble for indentured coolies. The Board cannot supply them quick enough. I am wanting forty or fifty extra hands for rough labour, and I have tried to get kafirs at 30s. per month, but without success. Formerly, as you know, the Colony paid a third of the expenses connected in the importation of coolies. That has ended. Mauritius still pays half the expenses. We planters get the coolies raw, and we train them, and the Colony gets the trained labour for nothing. Then the average rainfall is decreasing, and we have just had two years of drought. Last year we happily had a very fair rainfall. Then we have had locusts during four years, doing immense injury, and causing heavy direct expenditure. When they first appeared I had 70 men continually fighting them for three months. Fortunately I can now, with arsenic and treacle, do more effective work with eight men. Then there were the rinderpest losses, but rinderpest I am beginning to regard as a blessing in disguise, for it prompted me to go in for tram lines, which will prove much more economical than ox transport. I have about five miles of tramway. The grading of the line is done by farm hands, who have been taught by my son. Our worst grades are 1 in 30. The cost may be taken between £400 and £500 per mile, including rolling stock. The loaded cars come from any part of the estate to within a mile of the mill by gravitation; the remainder of the distance is an easy incline. For hauling the trucks I chiefly use mules — price £36."

Cultivation.

The whole of the estate is marked off into acre divisions by the planting of a banana tree at points 70 square yards apart. This ingenious system of beaconing is for the purpose of facilitating the setting out of piecework, and so far as possible all is piecework on a sugar estate. Wherever practicable all land is ploughed. On the coast, generally, the hoe is preferred, owing, probably, to the influence of Mauritian systems. Ploughing entails somewhat more supervision, but Mr. Wilkinson holds it to be considerably cheaper: in Mauritius the labour costs much less than in Natal. Nearly all the ploughing is done with hillside ploughs —the "Oliver," an American, is the make preferred by Mr. Wilkinson.

System of Ploughing.

The system of ploughing at Ottawa is remarkable, and, so far as I know, quite exceptional on the coast in Natal.

All cane rows are laid out on the level, so that on cultivating between the rows with a small American plough or scarifier, the horses walk on the level, and do not go up and down hill. In mellow land the loose soil, therefore, does not wash down, but rests against the cane stools. On the hillsides a furrow is first laid off through the middle of the field by flags placed by clinometer, and rows are drawn parallel from that either way. If the lines are getting out of level another level line is run. This plan enables the cultivation of hillsides to be carried on with little labour.

Peas and Beans.

In peas and beans, both for their various direct returns and for what they put into the soil, Mr. Wilkinson is a great believer. They enrich the land by their roots with the nitrogen they collect from the air,

their vines supply humus, and their produce sells well, and can be fed to the Indians and stock. Asking for some specific information as to the varieties, from his personal experience, Mr. Wilkinson replied :—

"The ordinary Indian pea, which blossoms and seeds in the winter is an excellent nitrogen giver ; it stands no frost however.

"The Louisiana cow-pea is the best as a vegetable for the table, it is best for orchards, and its vine is an excellent fodder. It should do well, I think, up-country. It makes good dholl. It is a rank grower on the ground.

"The Florida bean, and the Bourbon or Mauritius give good feed for stock, both in vine and in beans, and they should do well in many parts up country. They keep good for three or four years. They do well between mealies. Sow the mealies as usual, and when they are about two feet high plant the beans between the rows. I use a single "Eureka" planter, supplied by Messrs. North & Son. They sow the seed and the fertiliser capitally. When the mealies are ripe get them off, and there will be an enormous amount of splendid first-class fodder for cattle. They would give a splendid crop for ensilage. If desired for this purpose they could also be planted with mealies.

"The black-eyed American pea has a thick growth, and keeps green into winter. It is probably capable of standing a little frost. It is a pea for the table when green, and it is suitable for dholl."

The Date Palm.

"The date palm ought, I think," said Mr, Wilkinson, "to be cultivated along the coast. It should do well along the small streams where the wild palm grows. The wild date bears sometimes at six or seven years old from suckers. I am getting some suckers of the date palm from Teneriffe to plant out experimentally."

During my visit I had the pleasure of meeting Mr. Wilkinson's son, Mr. Gilbert Wilkinson. Much of the management of the estate falls to Mr. Gilbert Wilkinson, and I shall give some of his observations on various matters which cropped up in conversation.

Cane Rats.

About cane rats, which are monsters, reaching three or four pounds in weight, he told me that so timid are they, that they will not cross a bare place of two or three yards. Hence a breadth of that width, kept clear of long grass round a field of cane, provides perfect protection from those destructive rodents.

Locust Poisoning.

Mr. Gilbert Wilkinson is a great believer in arsenic poisoning for locusts. It appears that he was the discoverer of that system now so popular among the coast planters. His discovery resulted thus :— When locusts first made their appearance some five years ago he used to drive the insects towards sheets of iron supported on edge, and so arranged at an obtuse angle as to lead to the apex of the trap or the crush pen which they constituted. At the apex was a pit filled with treacle, and into which the locusts tumbled and were destroyed. The insects he happened to notice were intensely fond of the treacle, and it occurred to him that diluted treacle, mixed with poison, might be used with good effect, and so permit of the enormous work involved in the erection of screens and the beating of the locusts up to the screens, etc., being dispensed with. He put his theory into practice, and substituting arsenic and caustic soda for cyanide of potassium, the poison he first used, which evaporates, it succeeded even beyond his expectation and hopes.

Prickly Pear.

This pest of the vegetable kingdom he destroys by inserting into a small slit made in one of the leaves as much of a mixture of arsenic and caustic soda as will go on the point of a penknife.

Horsesickness.

Mr. Gilbert Wilkinson has found an indigenous drug with which he is confident horsesickness can be stopped. This is his procedure. From the beginning of December until April the temperatures of all his horses and mules are taken regularly every morning. One of the stable coolies does the work, and presents the temperatures, properly tabulated, of every animal. If in any case a temperature of 101 is recorded, then the drug is administered. On one morning a horse showed 105°. He was dosed, and in three or four hours the temperature was down to 101. No further bad symptoms

were noticed. This procedure has been followed two years, and not an animal has been lost from horsesickness. He is shortly about to sell the specific. It will then be put before the public, and the public will be able, for themselves, to judge of its efficacy.

A Snake Specific.

Mr. Gilbert Wilkinson has also a snake specific which he also intends to dispose of. His specific he affirms to be infallible in cases of ordinary snake bite. Puff-adders are the most common snakes of the canefields, and bites are frequent among the field workers. When a case occurs a dose of the medicine is given, and nearly always the bitten man or woman goes back and remains at work. There are, he says, no after ill effects, and after ill effects are common in cases of recovered snake-bitten people. The drug grows only on the coast.

Forestry.

Mr Anthony Wilkinson, to whom I now return, takes keen interest in many things, and perhaps the subject in which his interest is keenest is forestry. The enthusiasm is not of yesterday. Already in 1883 he publicly advocated in a paper, read before the Victoria Planters' Association, the desirability of the Government taking the subject in hand, and since then, whenever opportunities have offered, he had done all in his power to awaken the interest of his fellow colonists in what appears to him to be a matter of the very first importance. The climatic benefits induced by tree planting take the first place in Mr. Wilkinson's arguments on the question. He points out how the rainfall on the north coast has decreased since the opening up of the country by the destruction of the forest and bush, and by reference to instances of tracts of land in foreign countries hitherto affected by drought, which have secured good rainfalls by tree planting, he urges similar action on the coast to recover the rainfall which, in the early days, was normal to the district. In Victoria County, Mr. Wilkinson estimates that over forty thousand acres of forest and bush have been cut down during the last thirty years, and the steady diminution of annual rainfall averages is proved by records. Ten inches more of rain a year, "said Mr. Wilkinson," would give planters, with their present acreage, fully 25 per cent. more of sugar, and the money returns of the industry would benefit by a similar percentage." Mr. Wilkinson had much to say upon the increased temperature and radiation from the great areas now under cane and mealie cultivation which repel passing rainclouds, and about drought-stricken countries rendered fertile by the systematic planting of trees, and countries rendered barren through the destruction of moisture-alluring forests. On these matters, however, much has been published in the *Journal*, and therefore I shall proceed to the remarks which are the outcome of his personal experience. Thinking of what Mr. Willie Nicholson had said about native trees, I asked Mr. Wilkinson if he agreed.

"No; I do not. I say nothing against experimenting on a small scale for particular purposes, but for useful, profitable, trees, which would soon become moisture-attracting forests, we must go to Australia. Why; I am told lots of the native trees in the Karkloof are over 500 years old!"

Suitable Trees.

"From your own experience which are the trees you recommend."

"I have several favourites, but I am inclined to put the Rostrata or Red Gum of South Australia in the first place. The wood is straight in the grain, it is very hard, and sleepers would have twice the life of the soft timber ones imported. Then the Tereticornis and the Viminalis, or Torvale as it is called in this locality, are also good. All of these three trees seed themselves." Mr. Wilkinson here drew my attention to the young self-sown trees growing up outside the plantation, and where trees had been cut down. From his experiments he has decided that these gums should be planted not closer together than 12 feet. "Between the young trees I plant," he continued, "two rows of mealies; the cultivating of the mealies is of the greatest advantage to the trees, and the profits of the corn go to pay the expense of the tree planting. Mealie crops can be taken for a couple of years. At the expiry of 20 years the plantation should be worth £300 for sleeper timber; say 300 trees at £1 each, giving six or

seven sleepers. Some of the trees would be fit for felling at fifteen years of age. Self-sown trees I find are much quicker in growth. As you see, a man, if he does not put it off too long, may himself reap the money returns from his tree planting. I must not forget to tell you that I have found great difficulty in getting seed true to description from the Australian seedsmen I have dealt with. Like the 'Free State chemists,' they have a way of sending what they have most of. This has led to confusion of names."

"Are there any other good trees?"

"The Longifolia gum is also very good; the timber is hard, and it is ant-proof. The Cypress horizontalis grows into timber in fifteen years. The Pinus helepensis, which comes from the Mediterranean, gives timber of extraordinary durability: the coffins of the Egyptian mummies were made of this wood."

"And what trees to avoid?"

"It is no good trying on the coast, for forest timber, blue gum, stringy bark, pinus insignis, or black wattle—the climate is too hot."

"Are many accepting your precepts and following your practice?"

"About the first there can be no dispute, they are world established. About the second we few tree planters have but few followers. The fruit tree planting, and the planting of small belts of trees for ornamental or shelter purposes can have no appreciable effect. Moreover, more and more land is continually being leased and sold to the coolies and the coolies take the first place for keeping the surface of the ground they cultivate bare. After the crops have ripened they burn off everything, and the heat radiation from their fields must be intense. Everybody's business is nobody's business, and it is useless to expect the reafforestation of this district from private enterprise. The profits of forestry are splendid, but they are too remote. The average colonist is not a man to sink capital for returns 20 years off. Government ways may be more costly, but in compensation they can borrow money cheaper than private individuals. At any rate without Government assistance nothing will be done, and this district will go from bad to worse. Germany, Russia, France, India, the Cape, South Australia, and other countries have their Forest Departments, and I hope that Natal will not be without one much longer. All this I have written and said scores of times."

Forestry is the subject which commands Mr. Wilkinson's most enthusiastic interest, and with it I may fittingly bring the interview to an end.

Veterinary Departmental Report for June, 1901.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I HAVE the honour to forward my departmental reports for the month of July. There is nothing to which I need draw your attention in particular. A slight falling-off in the reported cases of contagious diseases is observable as a satisfactory feature in the reports as furnished from the various Districts.

Much time was spent during the month in the suppression of the disease rinderpest in the Umvoti Valley. As many weeks have elapsed, I am sanguine that this outbreak has been stamped out.

The considerable decrease in the number of cases of glanders reported is worthy of note. A year ago it was a matter of frequent occurrence to receive announcements of fresh outbreaks of glanders in various parts of the Colony. The frequency of such outbreaks seems to have steadily diminished, and I trust that we are within measurable distance of the announcement that glanders has ceased to exist in Natal. With the cessation of military operations, and the consequent promiscuous movement of horses, a better opportunity will be given of completing the good work already achieved by the Glanders Law of 1898.

The Quarantine and Grazing Depôts are acting efficiently in relieving the inconvenience of the necessary lungsickness restrictions.

The demand for quarter-evil vaccine has slightly fallen-off this month. The issues of this preparation have numbered 665 doses, which, however, is 375 doses in excess of the issue of the corresponding month last year. Of locust fungus 320 tubes were issued during the month.

I have the honour to be,
Sir,
Your obedient Servant,

H. WATKINS-PITCHFORD,
P.V. Surgeon.

MARITZBURG.—D.V.S. WOOLLATT.

Scab.—Throughout the Colony scab appears to be on the increase, and unfortunately at this time of the year an extension of time for dipping has to be granted, in many cases on account of the condition, etc., of the sheep. Hand dressing, however, of the affected animals is insisted upon when such an extension is granted.

Lungsickness.—In the Colony, outside the infected areas of Zululand and Klip River County, there have been five outbreaks of lungsickness during the month. The proclamation of the 12th February last, giving us power to place cattle under license within an infected area, has been of great assistance; the disease, however, will continue to be very prevalent in these areas until the movement of diseased military and loot cattle is stopped.

During the month several rumours and reports of rinderpest have been sent to the office, all of which, upon investigation, have turned out to be something else. There are now three Stock Inspectors working in Zululand.

DURBAN.—D.V.S. AMOS.

Glanders.—The stabling of the Colonial Carrying Company has been disinfected and altered to my satisfaction, and is now being used for stabling again. No fresh cases of glanders have come to my notice during the month.

Tuberculosis.—I have tested two cows, neither of which reacted.

Lungsickness still exists in three places.

Horsesickness.—One case was reported to me during the month.

A heavy fatality occurred in some goats that were landed ex S.S. *Induna*. Fifty per cent. died from over-eating rice just previous to landing. *Post-mortem* examinations showed ruptured stomachs and signs of suffocation. All living ones were affected with lympanitis, the common cause of death being asphyxia in those that died.

IXOPO.—D.V.S. VERNEY.

Scab.—A considerable amount of scab exists; the poor condition of the sheep, and the scarcity of food, being important factors in the spread of the disease.

HOWICK.—D.V.S. BYRNE.

Lion's River Division.

With the exception of scab, the Division is at present free from contagious diseases.

Umgeni Division.

I regret to say Mr. W. Oldfield and native tenants of Ambleton, Fox Hill, had again to be placed under license for lungsickness on July 20th, a beast of Mr. Oldfield's breaking down with lungsickness about two weeks after the quarantine had been raised.

Scab.—Two flocks have been placed under license.

Upper Umkomanzi Division.

Quarantine was raised during the month on the only two farms in this Division under license for lungsickness.

The Division is, therefore, now clear of lungsickness.

Scab.—Three outbreaks occurred during the month.

Influenza and laryngitis (or inflammation of the throat) are still prevalent in parts of my District, though not so much so as in June, and are much more amenable to treatment.

I had a peculiar case in an ox, the property of Mr. W. Oldfield, Fox Hill, which lost the power of swallowing, and all food accumulated in the back of the throat. I examined the mouth and throat but could find nothing, so diagnosed the case as paralysis of the muscles of deglutition or swallowing, and I treated accordingly with nerve tonics internally, and local stimulants to the throat, and was rewarded with a successful recovery.

I have had a few cases in cattle, all cows, the symptoms of which were very similar to those of stomach staggers in horses. The beast gets either paroxysms or fits, or else more or less comatose. I have been very successful with cathartics, nerve stimulants, and change of veld.

I had an uncommon case in a loot mare brought down from the front. When I saw this mare she had only been sick two days, the symptoms were :—Temperature 102 degs., very poor condition with fetid breath ; discharge from both nostrils ; oscultation gave a very decided abnormal sound in the chest on near side, in fact one could hear it by standing near the mare ; on percussion a very decided grunt and cough. I diagnosed the case as acute suppurative pneumonia, and advised that the mare should be immediately destroyed, which was done, and I verified my diagnosis by *post-mortem* examination, and found the lung and pleura extensively diseased. The carcase was at once buried, and every precaution taken.

MOOI RIVER.—D.V.S. WEBB.

Lungsickness.—One outbreak of this disease has occurred in the County during the month at Mr. A. P. Van der Merwe's, Springfield.

Cases treated during the month have included :—

Tetanus in a cow.

Laminitis, two cases.

Dunsickness in a thoroughbred mare. The case was fortunately taken in time, and the mare has made a complete recovery.

Dyspepsia in an imported Shorthorn bull.

Fistulous withers in an Australian mare.

Laryngitis in a Hackney stallion.

Flatulent colic in a Shire stallion.

Strangulated ventral hernia in a gelding.

Ventral hernia in a cow. This case I have reported at length.

Ventral hernia, a successful operation in a Shorthorn cow.

On May 27th, I was called in by Mr. J. Wallace to attend a valuable Shorthorn heifer which had, after a poke from an ox's horn, suddenly developed an enormous swelling on the right side, extending from the region of the flank down under the abdomen ; the swelling was as large as the largest of pumpkins. The diagnosis was ventral hernia. I had the cow placed on her back to see if the contents of the hernial sac could be returned. This proved absolutely impossible, and as the enlargement was tense, and showed signs of considerable inflammatory action, the result of the bruising and laceration of the abdominal wall, treatment, for the time being, had to consist of allaying this by fomentations, support to the swelling, and a limited diet. The opening of the hernial sac into the abdomen could not be felt.

On June 27th, I attended to operate on the heifer. The swelling was now quite soft, and extended further beneath the abdomen. The cow was thrown and secured, and I again tried to return the contents of the hernia into the abdomen, but without success. Neither could I ascertain by palpation where the laceration of the abdominal wall had taken place, but from the presence of a scratch on the skin to the right of the flank I judged it to be somewhere in that region, so decided to open the sac near this quarter. After washing, shaving, and disinfecting the skin, I made a horizontal incision of about ten inches. A large quantity of serous exudate escaped directly the skin was severed ; no adhesions had taken place. The opening through the abdominal wall I found about three inches above my incision through the skin. The rupture was quite six inches in length, and slit-like in shape. The contents of the hernial sac consisted of intestine and a portion of the uterus. I found it impossible to return these organs without making the abdominal wound still larger, and it was, even then, only with considerable difficulty that they were replaced. I now proceeded to suture the wound with carbolised catgut ; this part of the operation presented great difficulty, because I had to do the suturing with one hand, whilst the other was employed in retaining the viscera which exhibited a marvellous tendency to slip out again. Ultimately the omason came into view and filled up the opening, thus rendering the work of suturing much easier. The continuous form of suture was employed. I found, in consequence of the antagonistic action of the abdominal muscles, the rupture could not be com-

pletely closed, the edges would not come nearer than half-an-inch to each other, but I managed to fix it up so that the viscera could not return to the sac, and trusted to the inflammatory exudate filling up the cavity before the catgut gave way. I then thoroughly syringed out the hernial sac with a solution of perchloride of mercury, and afterwards dusted iodoform and starch over the internal wound, then sutured the incision through the skin, and dusted that also with iodoform and starch. The cow was now allowed to get up—the operation had taken nearly two hours to perform—she was placed in a clean stall, and fed on soft nourishing food, receiving nothing of a bulky nature. In a few days the inflammatory exudate was enormous, filling the cavity which had previously held the viscera. I had told Mr. Wallace to remove the stitches in the skin on the seventh day after the operation, but he had to be away at the time, and on his return three or four of the stitches had sloughed through, leaving an open wound, which I think proved beneficial, as it allowed the serous exudate to escape. The remaining stitches he removed. I now had the wound syringed out daily with a solution of potassium of iodide to promote absorption, afterwards dusted with iodoform and starch, and then covered with cotton wool. When I saw the cow last, on July 25th, she was progressing famously, the swelling had completely disappeared, and the skin wound was nearly closed.

GREYTOWN.—D.V.S. CORDY.

Scab.—Two fresh outbreaks have occurred.

Lungsickness. — The district is once more free from this disease.

Glanders.—None.

Rinderpest. — No fresh outbreak occurred during the month. With the exception of a few days, my time was solely devoted to the rinderpest quarantine area. All cattle in the immediate neighbourhood of the outbreak were inoculated with serum from the Allerton Laboratory. Three head of salted cattle were repeatedly fortified with virulent blood, and eventually bled for serum, which was sent to the Laboratory at Allerton. All cattle in the quarantine area were kept under observation by repeated inspections. In nearly all cases these had to be made on foot, the country being altogether too broken to permit of taking a horse.

General.—A large number of cases of vegetable poisoning have been reported from all parts of the District. In most cases it has been attributed to the cattle eating large quantities of the old and decayed mealie stalks. Several deaths have occurred in some of the troops, although, in other cases, all those affected have recovered.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—I have again to report that there is no diminution of the number of outbreaks of this disease in the Ladysmith and Newcastle Divisions. The reports from the Upper Tugela and Umsinga Stock-Inspectors are more favourable, no further outbreak having occurred in either of these Divisions.

The number of fresh licenses issued have been, viz.:—Newcastle 32, Ladysmith 28, and Dundee 7.

The infected herds are chiefly the property of natives and surrendered burghers from the adjoining Colonies, the majority of whom have not previously taken the precaution to inoculate their cattle. They are being settled on farms adjoining the borders of the Colony, which, previously, have been outside the traffic of infected cattle, thus, in a great measure, escaping the disease.

The influx of stock from the adjoining Colonies still continues. About 12,000 head of captured cattle, irrespective of those belonging to surrendered burghers, have arrived in the Colony during the month.

The comparison between Natal-bred and imported cattle suffering from this disease is interesting. The percentage of losses amongst imported animals often reaches as high as 50 per cent, whilst in the case of Natal-bred cattle the death rate very rarely exceeds 5 per cent.

Numbers of Overberg cattle die from complications, it being nothing unusual to see animals suffering from redwater and lungsickness at the same time, more especially during the summer months. Another thing worth remarking upon, is that virus taken from Overberg cattle for

inoculation purposes (even where every care appears to have been taken in its selection) often results in causing a tremendous number of animals to succumb to blood poisoning. Whilst in the case of virus taken from Natal-bred animals this very rarely occurs.

Drenching in the case of Overberg cattle in the majority of instances has proved an absolute failure, and is positively dangerous, unless the animals have been previously inoculated.

Scab.—In all, 29 fresh licenses have been issued during the month, viz. :—Dundee 16, Umsinga 2, Ladysmith 4, and Newcastle 7. The majority of these flocks are the property of burghers who have been sent into the Colony by the military authorities.

Several reports as to suspicious cases of rinderpest having occurred in my District proved groundless in every instance on investigation.

One farmer lost a large number of cattle from arsenical poisoning, due to turning his sheep on the veld immediately they had undergone treatment for scab with Cooper's dip.

Losses from poverty are very heavy throughout the greater part of my District amongst all classes of stock.

Photo by the Editor.

Model Dairy, Durban.

THE above depicts the interior of the Model Dairy, Durban—the first in South Africa. For a full description of the Dairy see No. 5 issue of the present volume.

Caponising.

SEVERAL times lately, says Mrs. Lance Rawson in the *Queenslander*, I have been asked to say something on this subject, which, apparently, is now beginning to interest Queensland poultry-keepers for the first time. Some years ago I had an article on caponising in these very columns, and though I have learned a great deal more about the matter since then, I am afraid I am not so keen an advocate for it—except under certain conditions—as I was then. However, there are, I am convinced, great possibilities for anyone who would go in systematically and on a large scale for a capon farm. The time will come when we will no more think of killing a cockerel than a ram, or, I should say, of keeping cockerels in preference to capons. In many of the poultry farming districts of China professional caponisers go round four times a year for the purpose of caponising the stock as they come on, and in other parts young capons are sold to the fatteners directly they have been operated upon.

Many people have said that it is too soon to go in for the practice, that very few know the difference between a capon and a cockerel. To which I say, they will never know it unless someone teaches them. The public will not accept any reform until they are taught and understand its meaning.

We would be very much disgusted if we found that our butchers were killing rams for mutton instead of wethers, or bulls for beef, and we have some idea of what the meat of such animals would be. Then why should we not have capons? For the difference in the flesh and the flavour is just as marked in the cockerel and the capon as between the ram and the wether, though in perhaps a lesser degree. The fact that I have lately procured three sets of caponising tools for people living in the far bush proves that the idea has to some extent taken root. It remains now to see whether it will continue or die out after a while like so many other things. There must be a beginning to everything, and the sooner the better when the question is one of reform.

In reply to those who make the assertion that a cockerel is as good eating as a capon, I say it is nothing of the kind, and those who say so can never have eaten capon. The farmers would no doubt take up the practice of caponising if they could be sure of getting an advanced price for the birds in the market; but that is not the view to take. We can and must educate the housewife and the cook to a preference for capons. It would not be a difficult matter to get a few customers among the better-off people, and gradually others would follow as they found that the capon was a larger and better bird. There is another reform in the poultry trade that is badly wanted, and one that would come with the sale of capons in the regular market—I mean the sale of poultry by weight instead of per pair or bird. And to encourage a more generous use of poultry meat I would suggest that even half-a-bird, or a smaller quantity, be sold. In Paris and some of the larger cities in the older countries of the world, every part of a fowl is utilised, and can be bought. For instance, a student who lives alone in Paris can buy the wing or breast of a fine fat capon for her Sunday dinner or breakfast, and cook it in her own way over her own little gas stove. Or one can buy the head, legs, and side bones all nicely cleaned, and make a cup of good chicken-broth. In this way the full value of a bird is got. In a well-fattened capon the waste is almost nil. Unfortunately I have mislaid or lost the letter in which I had the detailed particulars of the system followed by the market women in the lower-class parts of Paris; but, so far as my memory serves me, nothing but the intestines are lost, and they are not discarded until stripped of every particle of fat, fowls' fat being one of the most paying products from the industry; it is sold to the chemists for making a complexion ointment.

This part of the world is far too young and prosperous as yet to have recourse to such economies, though the day will come. At present, and for many a year yet, our capons—when we have raised them—are not likely to be equal to the

demand, and when they are we have the meat works, where they can be frozen for the export trade.

Now on the practical question of caponising, which is a very old and universal practice in China, France, and many parts of England. The Chinese are the most expert caponisers, and on most of their big farms it is quite a regular thing every three months for all the young stock intended for market to be operated upon, the females being converted into poulards, the cockerels into capons. In Queensland it will be many years before we have any surplus females for treatment, the egg industry being in far too flourishing a condition for them to be spared. In China, and also in France, eggs are a drug in the market, often fetching only 1d. to 1½d. per dozen. The advantages gained by caponising are—a larger bird, more delicate meat, and a bird that can be kept or held for market much longer than a cockerel, without being a trouble in the yard or growing coarse. This last is a great advantage in the bush, where far from a market, as one can hold them till there are enough to make it worth while to send them in. Cockerels are one of the greatest troubles on a poultry farm, because they worry the hens, fight with each other, and grow coarse almost at once after they have reached maturity. Not so the capon, for he remains fit for table up to and over two years of age.

The actual operation of caponising is extremely simple—when you have the proper instruments to work with ; but the novice should experiment on at least a dozen dead birds before tackling a live one. It does not take more than a couple to three minutes once you understand, and to all appearances the bird suffers less than a nervous operator, and within a few minutes of being released will eat readily and appear to have nothing the matter with it. Therefore, on the score of cruelty, there is no fault to be found with the practice. Naturally, anyone who operates should know exactly what he is about, and have rendered himself an expert by practice on dead birds first, then on living, otherwise he may cause unnecessary suffering, and probably lose a large percentage of birds. The instruments should all be of the best ; it is a mistake to work with makeshifts. There are several firms in Brisbane who keep the tools in stock, but the best I have seen are those sold by Hordern, of the Haymarket, Sydney. My attention was only drawn to them quite recently by a lady, who had a set bought there. They are an American make, and, so far as I can remember, the prices range from £1 1s. upwards, the set consisting of a knife, with forceps at one end, a spreader for holding the wound open, a hook for tearing the thin skin apart, a tube, with horsehair at the end, for severing the testicles, and cord and hooks for holding the bird down. There are other kinds of instruments, many of them very primitive. The Chinese, who are about the most expert caponisers, use merely a penknife, and a bit of split bamboo with a loop of silk or thread. Many of them even dispense with the latter, and use their fingers to tear out the testicles. Strange to say, rough as this method seems, I have known it to be very successful. Some few years ago I saw an old Chinaman caponise twenty-one birds in two minutes under the hour, and his only instruments were a small penknife and some cotton wool. He worked with his fingers, and was wonderfully expert. Of the twenty-one birds only one died, and that was hardly his fault, as it was far too young for the operation, and the opening that he had to make tore through, the bird being so soft and tender.

It is a mistake to think that all breeds are suitable for caponising. I know that many of the books and the articles that deal with the question tell one that every bird can be improved by caponising. It is not true. The small, active varieties are not worth operating on, because the difference made in their size is hardly noticeable. At the same time, it is as well if one begins the practice to subject every cockerel to it for the sake of peace in the yard. Only when one has to pay from 2d. to 3d. per head to a man to do it, it is worth while to consider whether the bird will gain that sum in value for the market. Capons are smaller feeders than ordinary fowls, and they will put on fat on far less food than cockerels will.

The best breeds for the operation are Wyandottes, Plymouth Rocks, Brahmas, Orpingtons, and any of the above with a game cross. A game capon is without

exception the most delicate fowl imaginable ; but they do not put on so much size as the heavier breeds, and size is, of course, the first consideration in the breeding of market birds.

The chief reason against caponising is nervousness. Many men cannot do it because of nervousness, and very few women will even try. I myself, notwithstanding that I had several lessons from three very expert men, am far too nervous to do it alone. I managed to get through five birds successfully while the teacher stood by, but alone I failed miserably. At the same time lots of ladies I know can and do operate themselves, and any one who will persevere can master it. The secret is to practice first on dead birds, and not to touch the living until quite perfect with the dead. I would advise the beginner to thoroughly examine all the internal arrangements that surround the parts to be operated on, and to do it with the aid of a strong magnifying glass. By doing this she or he will become familiar with the blood vessels that are likely to be ruptured by carelessness, nervousness, or other causes during the operation.

I have spoken about the tools ; now a word about the table. A strong box or the head of a barrel will do, but if possible it is best to have a board or table specially made with the hooks for the cords to keep the fowl steady. If a board is chosen, it should be smooth and well-dressed, and have a slight ledge round it, and a strong clamp, so that it can be clamped to a table. When about to operate get into such a position that the sun (or the lamplight at night) can shine down into the opening, and thus make all the parts visible. It is not wise to operate at night on account of the light, sunlight being the best for the purpose for many reasons.

The operation has been described in these columns, and very well and fully, not by me, but by one who was probably a practical caponiser. However, I will give the details again, and will ask all who are interested or who have any idea of ever taking up the practice to preserve this article, as it is not fair to others that the same directions should be repeated often.

The Operation.

Place the fowl on the table or board on its left side with the sun well on it. Wrap the cord thrice round the legs pretty high up. Place the other cord once round the wings, and fasten a weight of some kind to the other end of it. Let it hang over the side of the table so that you have the bird firmly secured. In placing the fowl you must use your own judgment as to getting it into the best position to suit yourself. Now, instead of plucking the feathers, as was the old way, you can wet them with cold water and twist them back one under the other ; in this way the feathers remain to protect and keep the wound cool and safe. Besides, there is no unsightly bare spot, as would be the case were the feathers plucked out. They will twist easily one under the other when wet. The colder the water the better and more likely to prevent bleeding. Be sure to wet the spot well before making the cut. Now pull the skin on the side down towards the hip ; this is so that the skin will go back to its place and cover the flesh wound when the work is completed. Make the incision between the first and second rib, pushing the point of the knife in firmly about one-quarter of an inch, no more. Hold it there for a second or two, as the bird may work his ribs up and down when he first feels the knife. When he is quiet again increase the cut to half-an-inch, or the slightest bit more, but be very careful not to have it too large. Put the knife down now, but keep the skin drawn back with the left hand, and take up the spreader between finger and thumb, pressing the two ends together. Then very carefully insert the two ends in the incision between the two ribs. You can now hold the spreader in place with the left hand and resume the knife. Increase the cut towards the backbone, and also forward on a line between the ribs until you think it is large enough for the free entrance of the scoop-twister—the instrument used to scoop out the testicles and twist them from the back. Some use a canula and loop of horsehair or catgut for this purpose, but the scoop is a later idea, and much more handy. I see by the latest American poultry journals that they are now made combined with clipping knife and hook, the whole set of tools in the one instrument. I would not advise anyone to send for them till something more is heard of them. Combination tools are not always a success. One thing to be careful of is not to go too close

to the backbone. A practised hand is able to do the whole operation with very little bloodshed by carefully cutting on a line with the veins and not crossing them. However the presence of blood is no evidence of failure, for the best operator may cause bleeding accidentally. Should there be much, wipe it off with a damp rag or small sponge before proceeding further, otherwise it may run into the wound, cover the testicles, and make the lower one hard to find; if it should so happen the blood can be scooped out. There is a fine membrane covering the testicles, which must be torn open with the hook at the reverse end of the scoop-twister. Just tear the skin enough to get the instrument through, and care must be taken, or you may puncture the intestines or an artery. The bowels can be pushed aside with the spatula in the left hand, and then just below you will see the left testicle. Introduce the scoop-twister (or if working with the canula make use of the spoon to get the horsehair loop over the testicle) with the right hand, and manipulate it, endways if possible, into such a position that the fine cord that attaches the testicle settles well into the slot in the scoop When this is right begin to twist the testicle off. This part is the most difficult to describe, and is where the beginner finds greatest difficulty. Patience is everything, do not hurry or get flurried, and if there is trouble in getting the testicle into the scoop use the spatula either to assist it or to keep the intestines out of the way while manipulating the scoop. It is always best to remove the left or lower testicle first because it is the hardest to get at. If the right is taken first and the bird bleeds at all, the blood will cover the other and so obscure it that there will be difficulty in getting hold of it. Get the left one out first, and the other can be got with little or no trouble. The whole of the testicles must be removed or the work is useless. The smallest piece left behind will grow and your bird will not be a capon. Among farmers such birds are called "slips," and they are far more trouble in the yard than cokerels. If you should fail to get the whole of the testicle at first, try again and persevere until every particle is removed, even if it be but the size of a small bead.

Leghorn and Game cockerels are about the most troublesome to operate on, because the testicles are very large and so apt to break and have to be removed in pieces, for which reason it is as well to treat them somewhat younger than other breeds. Four months is the favourite age in France, but Leghorns and Game are better done at three; in fact, all can be operated on from eleven or twelve weeks old up to five months. There is no occasion to sew up the wound, though some caponisers do it. If the skin has been drawn back as directed it will return to its place and cover the underneath cut, then the feathers, once dry, will cover the wound in the skin. Some operators do both sides instead of taking both the testicles from the one. I do not know why this is, because it is not difficult to remove both from the same side, and one would naturally think the one wound sufficient. However, as I have remarked before in these columns, every man has his own way of working ship—"Lay aft and haul down the jib"—and no doubt caponising is no exception.

The day following the operation, if there should be any appearance of windy swelling close to the wound, a darning needle just run into the bubble once will let the air escape. The birds can be cooped for a couple of days or not, according to circumstances. If there are other birds likely to molest or fight them, then pen the capons up for a day or so till the wounds heal, and they can be fed on soft food for a day or so. As a rule, they do not appear any the worse for the operation, nor is there any difference in them for the first month or six weeks; but then they begin to grow and put on flesh, and betray a changed and converted spirit. They become gentle and humble, and are inclined to turn the other cheek when the master of the harem talks largely and smites heavily. For a few weeks they appear to think deeply upon the social evil, finally arriving at the conclusion that their mission in this life is to rock the cradles other roosters fill, and like other brave (though featherless) bipeds, these martyrs to a scientific age become mothers to all the motherless chickens, and grow fat and tender in the perpetual contemplation of their own enforced virtue, and a rooted conviction of what

grand old fathers they would be if they only could.

In the event of a beginner cutting an artery, the only thing to do is to cut the bird's head off, and use him for dinner. You cannot save him, or rather it would not be worth while to try. But there is very little danger of accidents with the living birds if the caponiser has first experimented on dead. In those countries where caponising is done as a regular and recognised industry, the great art is to breed birds with yellow legs and skin, the poulterers objecting to all others. In one district in France, they mate Houdan cocks with Cochin hens, by which they get fine large pullets, and these they mate again with Plymouth cross cockerels, by which they get fine large birds with yellow skin and legs. Capons from the cross are about the finest table birds in the world. The Brahma and Cochin cross crossed again with Wyandotte, gives a splendid bird for a capon.

We want to establish a desire for capons among the richer people. Once get them to say they will only buy capons for their table, and someone will start a farm. The thing is to educate those who are in the habit of buying poultry to wishing for nothing else. Apparently the matter is interesting a few poultry-keepers just now, who intend to try them for their own tables, so possibly in another few years the practice will be universal. There are people at the present time who imagine the capon is a new breed, as was evidenced by a man sending to a poultry man in Victoria, a few months ago, for a setting of "capon eggs."

I have now written all there is to be written on caponising, and I trust my many correspondents who asked for the information may be able to understand and benefit by it. And once more, I will ask them to cut out and keep the article for future reference.

A Pigeon House.

THE pattern of the pigeon-house shown in our sketch (from "Poultry") is of convenient form and easily made. It will be found especially useful to the breeders of dragons and turbits, which mature best at liberty. The pigeon-house on a pole is usually made out of an old barrel, with holes made in the sides. The drawback

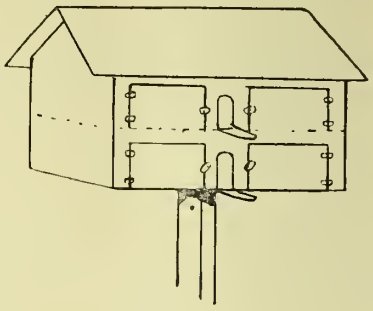

FIG. 1.

to this is the want of shelter from which all its inmates suffer. The pigeon-house shown (fig. 1) is meant to accommodate on two floors four pairs of birds. The ground plan (fig. 2) explains itself. In one half the size is given in inches, and the other shows the best position for the nest pans. A shelter board runs down each side of the entrance, to keep out the weather, but does not go sufficiently far

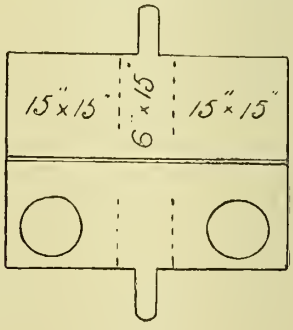

FIG. 2.

back to prevent the birds having free ingress to their breeding places. The position of the landing board is also shown. The doors are arranged in the same way on both sides of the house, and are necessary to clean it out and to examine the squabs. The best way to fix the house to the pole is by wrought iron elbows, screwed to the floor, and then to the pole. Place a strip of zinc 2ft. broad round the pole about 6ft. from the ground; this will be a protection from cats, rats, and other intruders.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	F. R. Moor ...	Greystone.
		,,	Cooke & Co. ...	Blue Krantz.
		,,	F. Bloy ...	Monte Christo
		,,	J. G. Maritz ...	Vi Plaats.
		,,	F. Knapp ...	Klipfontein.
		,,	G. M. Rudolph ...	Spitzburg.
		,,	J. W. Moor ...	Moorleigh.
		,,	Nqatabaan ...	Moord Spruit.
		,,	J. Oates ...	Oatsvale.
		,,	P. J. Bester ...	Rensburg Spruit.
		,,	R. C. O'Neil ...	Hillgrove.
		,,	C. J. Labuscagne...	Haatsfontein.
J. Button ...	Estcourt, South of Bushman's River	,	S. Nel ...	Wagon Drift.
		,	C. Cope	The Hoek.
		,,	C. B. Lloyd ...	Hidcote.
		,,	Mrs Lindsay ...	Rosebank.
		,,	W. J. Dickens ...	Derby.
		,,	Geo. Gibson ...	Craignevin.
		,,	S. C. Boshoff ...	Waterhoek.
		,,	L. Schomann ...	Twyfelfontein.
		,,	S. Schomann ...	Willow Grange.
		,,	C. Groom ...	Springvale.
		,,	W. McFie ...	Highlands.
A. H. Ball ...	Weenen ...	,,	J. K H Miller ...	Beacon Hill.
		,,	W. Lotter ...	Doornkloof.
		,,	P Van Rooyen ...	Middleburg.
		,,	C. P. F. Van Rooyen	Mona.
		,,	G. R. Van Rooyen	Victoria.
		,,	P. Lotter ...	Buffelshoek.
		Lungsickness	Mgina... ...	Location
J J. Hodson ...	Lion's River ...	Scab	W. Taylor ...	Fordoun.
		,,	W. T. Shaw ...	Shawswood.
		,,	W. Pepworth ...	Bolesworth.
		,,	Mrs F. McKenzie	Onverwacht.
		,,	W. L. Methley ...	Newstead.
		,,	S. Nurden ...	Wood Farm.
		,,	F. Curry ...	Weltevreden.
		,,	Geo. Woodhouse	Halliwell.
		,,	M. A. Sutton ...	Thorney.
		,,	Jas. Ross ...	Gowrie.
L. J. B. Hosking ...	Upper Umkomanzi	,,	A. Meugens ...	The Mains.
		,,	F. Nicholson ...	Alton.
R. J. Raw ..	Impendhle ...	,,	A. G. Mack ...	Misty Home.
		,,	T. Fleming ...	Good Hope.
		,,	J. W. Brooke ...	Impendhle Store.
		,,	G. Renyard ...	Hamilton Hall.
		,,	A. C. Crosse ...	Dingley Dell.
		,,	R. Gresham ...	Castle Howard.
		Lungsickness	C. C. Lewis, and Native ...	Clairmont.
W. Wilson ...	Polela	,,	Miller, Bros. ...	Fairacres
		Scab	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
		,,	R. Nicholson ...	Lowlands.
		,,	R. C. Gold ...	Woodend.
		,,	R. M. Arbuckle ...	Costmore.
		,,	J. J. Van Dyke ..	Riverport.
		,,	J. Van der Merwe	Nooitgedacht.
		,,	S. Maritz ...	Maritzdale.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
C. E. Hancock ...	Ixopo ...	Scab	R. Kennedy ...	Cornhill.
		,,	A. Watson ...	Rosehill.
		,,	W. Gray ...	Helmsley.
		,,	Natives ...	Langefontein.
		,,	J. Dalgarno ...	Abercairney.
		,,	A. Stone	Craigie Lee.
		,,	W. W. Walton ...	Dronk Vlei.
		,,	P. J. Webb ...	Crystal Manor.
		,,	L. Howes ...	Mornington.
		,,	G. Thompson ...	Cromwell.
		,,	J. Anderson ..	Littledale.
		,,	Est. R. Raw ...	Eastwolds.
		,,	Lulakana ...	Mackenzie's Farm.
J. F. Bernard ..	Newcastle	Lungsickness	J. Mortimer ...	Try Again.
		,,	P. W. Dept. ...	Newcastle T'Lands
		,,	G. E. Jubber ...	Brackfontein.
		,,	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		,,	A. Paine ...	Mount Prospect
		,,	Simeon Ndhlovu	Freda.
		,,	C. R. Savory ...	Pomeroy and Evin
		,,	Blizzard & Pratt	Ingogo.
		,,	G. Wood ...	Heron's Court.
		,,	A. F. Henderson...	Brazil.
		,,	Lowrens and Van der Merwe ...	Buffalo River.
		,,	H. Fick ...	Northdown.
		,,	H. Austin ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	Natives ...	Elizabeth Dale.
		,,	J. Masangu ...	Pernambuco.
		,,	Funwayo ...	Tiger Kloof.
		,,	G. W. Nourse ...	Blauwbosblaagti.
		,,	G. W. Nourse ...	Glen Harte & De Wetstroom.
		,,	W. Steele ...	Tweefontein.
		,,	— James ...	Newcastle.
		,,	Umketega ...	Vrede.
		,,	A. J. Hurd ...	Tweefontein.
		,,	G. J. Way (Derelict Stock) ...	Vrede.
		,,	Mtshabane ...	Reserve.
		,,	Mahakan ...	Kilbarchan.
		,,	Johannes ...	The Reserve.
		,,	Umbetta ...	Freda.
		,,	Maling & Sibibi...	Blauwboshlaagte.
		,,	Umgubana & Mahlogozulu ...	Hope Farm.
		,,	S. W. Reynolds ...	Ramsgate.
		,,	Mangweni ...	Hope.
		,,	W. Uquhart ...	Laureston.
		,,	Jack Unguni ...	Blauboshlaagti.
		,,	Umpegelele ...	Kilbarcean.
		,,	W. Adendorff ...	Sanford.
		,,	S. W. Reynolds ...	Minster.
		,,	Umgodini & Kumalo	Greenwich.
		,,	H. Meineke ...	Ruston.
		,,	Umbobojan ...	Valsefontein.
		,,	Mrs. H C. Shorter and Sambana ...	Spectacle Spruit.
		,,	J. T. Grant ...	Rooi Pont.
		,,	C. Jackson ...	Yarl.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	H. C. Dicks ...	Minster.
		,,	T. Ferrier ...	Henley.
		,,	Sekonyana ...	Rooi Poort.
		,,	McMurray & Hurd	Greenwich.
		,,	J. Surtees ...	Newcastle.
		,,	Tinta ...	Ballengeiches.
		,,	Verasamy ...	Newcastle.
		,,	Tunziane ...	Blauwboshlaagte.
		,,	W. G. Moss .	Mossdale.
		,,	J. R. Watt ...	Main's Camp and Bothadale.
		,,	Umkonazi & Pochies	Milton.
		,,	W. L. Oldacre ...	Broadfield.
		,,	C. Kennedy ...	Tennyson.
		,,	Freeman ...	Shakespeare.
		,,	Jim Gama .	Blauwboschlaagti.
		,,	A. James ...	Kabbaslaagti.
		,,	A Osborn ...	The Mount.
		,,	Wade & Andrews	Macclesfield.
		,,	A. Vanderplank ...	Eagle's Cliff.
		,,	Umshafut ...	Shakespeare.
		,,	J. C. Richards ...	Rooi Pont.
		,,	J. Kumalo and Ndhlebe	Massondale.
		,,	Makehla ...	Tiger Kloof.
		,,	Nehorasing ...	Newcastle.
		,,	Indians ...	Bosch Hoek.
		,,	A. H. Tatham ..	Newcastle.
		,,	Inkombe ...	Vlak Laagte.
		,,	Sehlunga ...	Blauwboschlaagte.
		,,	Machambu ...	Tiger Kloof.
		,,	Umhlala and Ningazana	,,
		,,	Mgomana ..	Ardrossan.
		,,	Jusveer ...	Lennoxton.
		Scab	G. Star ...	,,
		,,	C. G. Palmer ...	Dry Cut.
		,,	J. Davidson ...	Lennoxton.
		,,	G. Wood ...	Heron's Court.
		,,	A. D. Uys ...	Horn River and Mooi Krantz.
		,,	T. Ferrier ...	Henley.
		,,	G. Jackson ...	Try Again.
		,,	W. Richards ...	Tweefontein.
		,,	W. E. Few ...	Erin & Imbezana.
		,,	Blizzard ...	Ingogo.
		,,	W. Short ...	Potter's Hill.
		,,	J. Matthews ...	Shakespeare.
		,,	G. Brown ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	R. S. Armitage ...	Boschhoek.
		,,	H. P. Beare ...	Harte River.
		,,	— Wood ...	,,
		,,	Jim Smith ..	Lennoxton.
		,,	S. W. Reynolds ...	Minster &Ramsgate
		,,	N. H. Fick ..	Wykom.
		,,	A. Vanderplank ...	Eagle's Cliff.
		,,	W. Nicholson ...	Rooi Poort.
		,,	M. C. Behr ...	Shuttleworth.
		,,	H. Meek ...	Diepe Hooten.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner	Farm.
J. F. Bernard ...	Newcastle ...	Scab	J. McDonald ...	Yarl.
		,,	John Vos, jun. ..	Belfast & Manning.
		,,	Mrs. John Vos, sen.	Landsend.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	Anea & Latcham	Plessis Laager.
		,,	W. Oldfield ...	Ambleton.
		Scab	Dickinson Bros....	Braeburn.
		,,	Ulukozana ...	Bishopstowe.
		,,	Bobobo and Umbabana	Zwaartkop Location.
J. Chaplin ...	Klip River ...	Lungsickness	A. H. Spring ...	Reserve.
		,,	A. Armstrong ...	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ...	Grobblar's Kloof.
		,,	Natives ...	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,,	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	Pepworth & Reid	Reitfontein
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein
		,,	J. Van Whye ...	Ladysmith T'Lands
		,,	G. J. Heslop ...	,,
		,,	H. E. K. Anderson	Gedula.
		,,	E. F. Gibbens ...	Plaat Berg.
		,,	G. F. & J. Woodhouse	Davel's Hoek.
		,,	Natives ..	Georgina.
		,,	G. J. McDuling ..	Waterford.
		,,	Natives ...	Langverwacht.
		,,	Nondo Gama ...	F. J. Dewaals' farm
		,,	A. Boers, & Native	Marais Vel.
		,,	W. Neizel, & Natives	Roosboom.
		,,	Natives ...	Doornkraal.
		,,	J. Umpbleby ...	Springfield.
		,,	F. N. Nel ...	Catherine.
		,,	Natives ...	Macpherson'a farm.
		,,	P. Ruiter ...	Ladysmith.
		,,	Mdhlondhlo ...	Blaaubank.
		,,	Jobisa ...	Lombard's Kop.
		,,	Nosubala ...	Weltervreden.
		,,	H. E. K. Anderson and others ...	Dewdrop.
			Nondabola ...	Zwaart Kop & Dew Drop.
		,,	B. G. Zietsman ...	Bosberg.
		,,	Natives ..	Roodepoort.
		,,	W. Cochrane ...	S. Wiltshire's farm.
		,,	J. de Jongh & Natives ...	Potini Spruit.
		,,	Natives ...	Reit Kuil.
		,,	A. S. McHattie ...	Wessel's Nek
		,,	Cory & Long ...	Ladysmith T'Lands
		,,	Henderson ...	Weltervreden & Paarde Vort.
		,,	Scomber ...	Kleinfontein.
		,,	G. Robinson ...	Little Manara.
		,,	Natives ..	Dreifontein.
		,,	J. Farquhar ...	Stuart's Park.
		,,	Malcla ...	Reit Kuil.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Lungsickness	P. W. Dept. ...	L. Smith Tn. Lds.
		,,	Myanga Tigalala...	Umhlumayo.
		,	A Henderson ...	Nelthorpe.
		,,	Malife	,,
		,,	T. Wright	Davel's Hoek
		,,	Natives	Jonono
		,,	P. Tondo	Weston
		,,	H. Neville	Quagga's Kirk
		,,	M. Shea ...	Ladysmith Town Lands.
		Scab	J. H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson ..	Walker's Hoek.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	E. F. Gibbens ...	Plaat Berg.
		,,	G. Wetherill ...	Walker's Hoek
		,,	A. Krogman ...	Brakfontein.
		,,	M. W. Krogman...	Dreifontein.
		,,	P. Marais ..	,,
		,,	H. Boers ..	Dew Drop.
		,,	G. Spearman ...	Feir View.
		,,	J. Van Reenen ...	Wessel's Nek.
		,,	A. Boers ...	Marais Vel.
		,,	A. Carbutt & J. Goed	Matiwaan's Hoek.
		,,	Sparks Bros. ...	Ladysmith.
		,,	J. de-Waal ...	Blaubank.
		,,	F. J. de-Waal	Lombard's Kop.
		,,	G. Innes ..	Eland's Laagte.
		,,	J. Umpleby ...	Springfield.
		,,	A. J. Taylor ..	Arnot Hill.
		,,	R. Horsley ...	Warrock.
		,,	Dr. Helps ...	Roosboom.
		,,	Corrigel ...	Koolfontein.
		,,	Cockrane & Illing	Dansekraal.
		,,	H. S. Bowers ...	Zaaifontein.
		,,	A. Henderson ...	,,
		,,	A. Henderson ...	Eenvogle Vlei & Elandslaagte.
		,,	G. Ashby	Acol
		,,	W. Wright ...	Colworth.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	H. F. Pearson ...	Everton.
		,,	R. H. Stainbank...	Stamford Hill.
		,,	A. S. Goble ...	,,
W. Freer ...	Upper Tugela ...	,,	Borbasee ...	Krom Draai.
		,,	S. Sharratt ...	Klein Waterfall.
		,,	Natives ...	Green Point.
		,,	A. H. Coventry ...	Earthcote
		,,	Mdhlenjana ...	Mooi Hoek.
		,,	Janshey & Indaba-zimbi ...	Acton Homes.
J. R. Cooper ...	Nqutu & Nkandhla Districts, Zululand	,,	A. Barklie ...	Nqutu Hill, Nqutu District.
		,,	Natives ...	Telezi Hill, ,,
		,,	,,	Nqutu Hill, ,,
		,,	,, .	Rorke's Drift, ,,
		,	E. P. Vant ...	Vant's Drift, ,
		,,	Natives ..	,, ,,

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. R. Cooper ...	Nqutu & Nkandhla Districts, Zululand ...	Lungsickness	Umasesa ...	Hlati Spruit, Nqutu District
		„	Natives	Mangeni, „
		„	H. Fry ...	Mpandhleni, Nkandhla District.
		„	P. Zietsman ...	Near Umhlatuzi, „
		„	Natives ...	„ „
		„	Hutchinson and Hyslop	Near Magistracy, „
		„	Struben, Bottomley & Loxton	Upper Umfongosi, „
		„	„	Middle „ „
		„	„	Lower „ „
		„	„	Qudeni Hill, „
		„	J. Vanderwesthuisen	Near Inzuzi, „
		„	H. Swanfield ...	Qudeni, „
		„	Schonyana ...	Babanangu „
G. Gielink ...	Eshowe. ...	„	Sibobile ...	Matikulu, Eshowe District.
	Entonjaneni, and Umfolosi Districts, Zululand.	„	Umhlukwana ...	Umsunduzi, „
		„	A. Garland, ...	Bond's Drift, „
		„	G. Higgs & Co. ...	Umhlatuzi, „
		„	P. W. Labuscagne	„ „
		„	F. McGuire ...	„ „
		„	L. Schultz ...	Near Eshowe „
		„	Luigie ...	Umfuli, Entonjaneni District.
		„	L. Kritzinger ...	Osborn. „
		„	R. J. Ortlepp ...	Merino, „
		„	J. Fry ..	Empepala, Eshowe „
		„	James Umtembu	Entumeni, „ „
		„	J. R. White ...	Schuithoek, Entonjaneni District.
		„	P. Pretorious ...	St. Andrews, M.S., Eshowe District,
		„	Butze ...	Eshowe „
		„	Volker, Schultz, F. Stockholm	Port Durnford „
		„	P. Nel ...	Umhlatuzi „
		„	B. and F. Green ...	Inyoni „
		„	W. Magee ...	Umlalazi „
		„	Arnold, Rorck and Magee	„ „
		„	— Corbett ...	Amatikulu „
		„	J. Henwood ..	Inyoni „
		„	G. Müller ..	Duikerhoek, Entonjaneni District.
		„	F. Buys ...	Barneveld „
		„	Damusa ...	Kemp's Farm, Melmoth „
		„	F. A. Ortlepp ...	Saxony „
		„	T. Smith ...	Oakdale „
		„	J. A. Ortlepp ...	Vlakbult „
		„	J. R. White ...	Elizabeth „
		„	T. Cooper ...	„ „
		„	Jas. Howe ...	Lower Tugela, Eshowe District.
		„	E. W. Lamb ...	Amatikulu „
		„	C. Adams ...	Umlalazi „
		„	F. Dickens ...	„ „
		„	Carlie ...	Imfuli M.S., Entonjaneni District.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
G. Gielink ...	Entonjaneni, and Umfolozi Districts, Zululand.	Lungsickness	C. J. Van Rooyen	Wansbeck, Entonjaneni District.
		„	H. A. Liversage ...	Morgeson, Entonjaneni District.
		„	Umlomo-Umdinwa	Ematikulu, Eshowe District.
		„	L. Botha ...	„ „
		„	H Liversage ...	Umlalazi, „
		„	P. Nel ..	Noitegedacht, Entonjaneni District.
		Scab	R. J. Ortlepp ...	Merino, Entonjaneni Disttrict.
W. W. Dore ...	Portion of Zululand North of White Umfolozi and Umfolozi Rivers	Lungsickness	Dinizulu ...	Hlabisa District.
		„	Surrendered Boers	„
		„	C. Wheelwright ...	Nkonjeni, Mahlabatini District.
		„	— Van Rooyen ...	„ „
		„	E. Loffler ...	Bulwana, „
		„	Magojala ...	„ „
		„	Mapangisa-Zambula	Ingwavuma District.
		„	Nsicongo-Umkoombuzi	Hlabisa District.
		„	Nomacamcam-Dada	„
		„	Noham-Ukusa ...	„
		„	Mahakan-Mangaba	„
		„	Mangumsan-Matanta	„
		„	Umhoomo-Umcatusa	„
		„	Umlogotwa-Buzani	„
		„	Gufa-Nsihow ...	„
A. Klingenberg ...	Umsinga ...	„	Ungangaza ...	Pression.
		„	E. V. L. DuBois ...	Vergelugen.
A. J. Marshall ...	Dundee ...	„	H. Müller ...	Vermaak.
		„	Natives ...	Renier.
		„	Natives ...	Navigation Colliery.
		„	N. Glutz ...	Swiss Valley.
		„	C. F. Van Rooyen	Davelsberg.
		„	H. J. Harris ...	Sterkstroom.
		„	D. Neumann ..	Waterfall.
		„	Natives ...	Weltervreda.
		„	S. N. Robins ...	Dundee.
		„	N. Glutz ...	Morgenstont.
		„	Natives ...	Maybole
		„	Umonto ...	Crown Lands, near Dundee.
		„	J. F. Johnson ...	Dewaar's Nek.
		„	Murray & Co. ...	Navigation Collieries
		„	J. Kemp & Natives	Kelvin
		„	J. H. Reis ...	Longfontein.
		„	J. Landman ...	Boschfontein.
		„	D. C. Pieters ...	Goedekeus.
		„	A J. Hurd ...	Waschbank.
		„	J. A. Naude ...	Dewarsberg.
		„	Umsombuloko ...	Hatting Dale.
		„	Umnyesa ...	Klipwe.
		Scab	A. Jansen ...	Sheepridge.
		„	J. H. Erkland ...	Carolina.
		„	F. J. deWaal ..	„
		„	J. H. Reis ...	Longfontein.
		„	J. W. Dupreez ...	Jackalsfontein.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ...	Dundee ...	Scab	H. J. Hearn ...	Hatting Spruit.
		,,	N. Glutz ...	Swiss Valley.
		,,	C. F. Van Rooyen	Davelsberg.
		,,	Maritz & Thornhill	Aletta.
		,,	W. V. Marshall ...	East Lynne.
		,,	P. J. Gouws ...	Uitflucht.
		,,	H. Harris ...	Sterkstroom.
		,,	Murray & Co. ...	Navigation Collieries
		,,	J. J. Uys ...	Verdenk.
		,,	P. H. Swart ...	Hartebeestefontein.
		,,	H. J. Nel ..	Blinkwater & Evansdale.
		,,	A. G. Vincent ...	Craigieburn.
		,,	D. Meumann .	Waterfall.
		,,	Turnbull & Co. ...	Washbank.
		,,	Peerbhoy ...	Dundee.
		,,	H. J. Hearn ...	Double Kraal.
		,,	Thos. Dewaar ...	Navigation.
		,,	A. B. Daniel ...	Beith.
		,,	H. Kriel ..	..
		,,	F. Kolbe ...	Langfontein & Staat.
		,,	G. Colbe ...	Zwaartwater & Rest
		,,	R. J. Marshall ...	Cleveland.
		,,	G. F. Ferreira ...	Hyle.
		,,	J. Kemp ...	Kelvin.
		,,	J. Campbell ..	Manor Park.
		,,	Marshall Bros. ..	Cleveland.
		,,	J. Meyer ...	Mauchline.
		,,	A. J. Potgieter ...	Dewarsberg.
W. A. Hutchinson	Alfred ...	,,	W. Stafford ...	Sutherland.
		,,	Nqubu ...	Location.
		,,	Makubana ...	Amaci Location.
		,,	J. S. Payn ...	Furney Hill.
		,,	J. Wessels ...	Sheepwalk.
		,,	G. Whitelaw ...	Deemount.
		,,	Geletu Flentyi ...	Location.
		,,	Inkubi and Duli ...	Location.
W. Gray ...	Upper Tugela, S. of Tugela River	Lungsickness	P. Van der Reit ..	The Bend.
		,,	F. E. Zunckel ...	,,
	& Estcourt, N. of Bushman's River	Scab	A. J. Harding ...	Zwart Kop.
		,,	J. Dryer ...	Culfergie.
		,,	C. C. J. Bester ...	Brand Kraal.
		,,	J. M. Wales ...	Farleigh.
E. Varty .	Umvoti—Western Portion	,,	A. M. Hofmeyer...	Emandhlini.
G. N. Perfect ...	Umvoti—Eastern Portion	,,	L. J. Nel ...	Glenboig.
F. E. Van Rooyen...	Kranzkop ...	,,	L. J. Potgieter ...	Broedershoek.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	— Thompson ...	Marburg.

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand have been proclaimed by the Governor an infected area under the Lungsickness Act.'

Principal Veterinary Surgeon's Office,
25th September 1901.

M. J. HIME,
for P. V. Surgeon.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of August, 1901.

STATIONS	TEMPERATURE (In Fahr. Degrees).				RAINFALL (in inches).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1901.	Total for same per'd from July 1st, 1900.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	75·3	55 8	97·9	49·7	3·17	8	2·26	13th	3·19	3·18
Stanger...	77.7	54·1	99·0	45·0	2·22	6	·96	24th	2·43	3·21
Verulam	77·6	53·9	99·0	44·0	2·02	6	·83	24th	2·02	2·89
Greytown	78·4	52·7	88 0	38·0	2·64	3	1·68	24th	2 64	...
Newcastle	76·2	42·0	81·0	33·0	3·20	3	2·09	25th	3·20	1·05
Estcourt	74·6	38·6	87·0	30·0	1·35	3	1·10	25th	1·35	2·54
Port Shepstone .	73·1	61·7	85·0	52·0	1·49	7	60	16th	1·92	2·28
Umzinto	79·6	50·3	90·0	43·5	·68	7	·20	24th	·80	3·10
Richmond	72·1	46·6	90·0	35·0	1·65	6	1·04	24th	1·65	2·47
Maritzburg	75·0	45·4	91·0	35·0	1·61	5	1·13	24th	1·61	1·20
Howick...	74·0	40·5	86·0	28·0	1 80	6	1 18	25th	1·82	1·10
Weenen	79·1	35·6	90·0	30·0	1·73	2	1·03	25th	1·73	1·68
New Hanover	75·0	44·7	89·0	34·0	2·34	9	1 45	24th	2·38	2·41
Hillcrest	70·8	52·3	94·0	44·0	1·82	3	·97	25th	1·83	...
Mapumulo	79·7	50·5	93·0	43·0	2.49	4	1·26	25th	2·51	2·73
N'Kandhla	67·3	54·9	82·0	44·0	...	...	...	...	...	...
Umlalazi	75·0	60·0	90 0	45 0	3 23	6	1·06	26th	4·16	2·46
Hlabisa	72·5	54·7	90·0	49·0	1·70	3	1·10	26th	2·20	1·87
Melmoth	78 5	51·5	98·0	44·0	2·28	4	1·25	25th	2·29	2·08
Ubombo	72·7	55·1	85·0	49·0	2·22	6	1·35	26th	2·37	...
Eshowe...	75·5	53·2	92·0	46·0	3·13½	5	...	...	3·39	3·35
Nqutu	69·2	48·8	82·0	39·0	...	...	...	...	...	...
Point	...	.	...	...	1·56	5	...	...	1·62	...
South Coast Junction	...	...	. .	...	3·81	10	2·85	13th	3 91	...

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc: 37, 1900. For the month of August, 1901.

Date.	Description.	Quantity.	Imported from.	Ship.	Remarks.
1901.					
Aug. 1	Potatoes	4,004 cases	Melbourne	Isle of Kent	Free of Pest.
„ 5	Potatoes	2,044 „	„	„	„ „
„ „	Potatoes	1,815 „	Tasmania	„	„ „
„ „	Seed Potatoes	200 „	Melbourne	„	„ „
„ „	Apples	150 „	„	Aberdeen	„ „
„ 8	Seed Potatoes	655 „	„	Gulf of Siam	„ „
„ „	Potatoes	278 Bags	„	Aberdeen	„ „
„ „	Fruit Trees	3 bales, 600	Wynberg, Cape Colony	Dunottar Castle	„ „ „ „
„ 19	Potatoes	29 bags	Melbourne	Damascus	
„ „	Ferns	8 boxes	Cape Colony	PembrokeCastle	„ „
„ „	Apples	45 baskts	Madeira	„	„ „
„ 28	Seed Potatoes	553 Cases	Melbourne	Wilcannia	„ „
„ „	Veronica (Shrub)	1 plant	Albany	„	„ „
„ „	Apples	55 baskts	Madeira	PembrokeCastle	„ „
„ „	Apples	350 Cases	Adelaide	Ormidale	„ „
„ 30	Fruit Trees	10 bales, 2,000	Cape Colony	PembrokeCastle	„ „

C. B. JONES, Examining Officer, Agricultural Department.

Custom House, Durban, September 4, 1901.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 6th November next :—

Howick.—Black ox (young), white belly and brush, brand on right hip indistinct, like WT.

Estcourt.—Two Merino rams, poor condition, large horns, branded broad arrow right hips, also same side, like a broken D, on right ribs, top of rump, Z, probable value, 10s. each.

Petroscar.—Brownish-black mare, with star, 4 years old, branded PM on right hip, three white feet, switch tail. Small brown mare mule, branded S within circle on top right hip, long tail, harness-marked, very wild. Small dun mare mule, branded S within circle on top right hip, P on left flank, harness-marked.

Highbury.—Black-and-white cow.

Maritzburg. — On the farm "Mount Partridge," of Mr. James Bonnar, unbroken colt, nearly black, square cut tail, indistinct brand off shoulder, wearing headstall. On the farm "Woodhouse," Wilge Fontein, of Mr. F. J. Clark, two horses, one dark-brown, one bay, no brands, age about 5 years, headstalls on.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write :—Now that there seems a possibility of the Rand opening within a reasonable time, speculators are making their presence felt, and although, as last reported, very little is being done beyond enquiries, nevertheless, from the fact that enquiries are being made for certain lines of produce, this has a tendency to harden prices. Occasionally we hear of a few truck-loads of grain going forward, but as there are large stocks to draw from, those who were certain that mealies would realise 21s. per muid before ploughing commenced, will, for once, be out of their calculations.

Mealies.—The average price during the last fortnight has been 12s. to 12s. 3d. per muid, including sack.

Hay.—Owing to the splendid rains of the last fortnight, hay has been somewhat scarce, and the price has ruled between 3s. 9d. and 3s 11d. per 100lbs. ; bedding, from 15s. 6d. to 21s., according to size of load.

Potatoes.—Good eating potatoes are far from plentiful, with the result that prices are high. However, now that rain has fallen in every district of the Colony, we may expect new crops within reasonable distance. Prices have fluctuated between 6s 6d. and 23s. 6d. per 100lbs. Sweet potatoes from 1s. 6d. to 4s. 9d. per bag.

Mabele.—From 3s. 6d. to 23s. 3d. per 100lbs.

Tobacco.—From 6d. to 11d. per lb.

Beans.—Canadian Wonders, from 16s. 6d. to 18s. 6d. per 100lbs ; red, from 6s. 6d. to 12s. 6d. per 100lbs.

Pumpkins.—From 3s. 3d. to 9s. per dozen.

Onions.—From 8s. 4d. to 25s. per 100lbs.

Eggs.—From 7d. and 1s. to 1s. 2d. and 1s. 9d. per dozen.

Butter.—Some samples have been as low as 5d., 6d., and 11d. per lb ; but good samples from 1s. 6d. to 2s. 7d. per lb.

Poultry.—Fowls (chickens) about 1s. 6d., fit for table, from 2s. 6d. to 3s. ; some samples realised from 8s. to 9s. each ; ducks, from 5s. 3d. to 9s. 6d. per pair ; turkeys, 13s. each (hens) 10s. 3d. to 11s. 9d. each.

Sundries.—Mutton, from 4d. to 1s. per lb. ; pork, from 4d. to 8d. per lb. : rabbits, from 6d. to 2s. 3d. each. Fish has been sold several mornings of late, averaging about 5d. per lb

Vegetables.—Beans. beetroot, cabbages, celery, carrots, cauliflowers, lettuce, onions, potatoes, peas, broad beans, French beans, &c., &c.

Fruit.—Bananas, lemons, loquats, oranges, naartjes, and pineapples sold every morning.

Wood.—From 4d. to 9d. per 100lbs., cut 1s. 1½d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes :—

General.—Trade is brisk, and most of the local firms are full of orders ; the only check on a still greater volume of business is the inability of the N.G.R. to carry the tonnage offered.

Mealies.—The market continues strong, and farmers are asking 12s. a muid at up-country stations. It is doubtful whether higher figures will be reached for some time, as the drain on the new crop is hardly appreciable as yet.

Forage.—A very good crop, considering the limited acreage planted, is being reaped, and those farmers who did a little gamble on the absence of rust have scored. Rust certainly appears to be dying out, and all farmers should plant a limited area under summer oats. The Durban market is entirely supplied by imported fodders, so the local price of forage does not come under the scope of this report.

Potatoes.—Like snakes in Ireland—there are no potatoes, of local growth at least. Fortunately we can import, and France at present supplies us with a tuber of a kind not to be surpassed by any from any part of the world.

Scarcely any colonial produce is to be seen in the Durban market, with the exception of mealies, and imports of all descriptions hold supreme sway.

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AND MINING RECORD.

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Reading Cases for holding a year's issues of the "Agricultural Journal," leather back, cloth sides 26 strings, lettered on side, 1s. 6d. each. Binding yearly volumes in cloth, 4s. each.

CONTENTS.

Strangles in Horses.

BY H. WATKINS PITCHFORD, F.R.C.V.S.

IN response to an enquiry which I have seen expressed lately in the public Press, I have decided to pen a few lines, in reply, hoping that such information may be of use to Horse-owners generally, if called upon to undertake the treatment of this disease, which, though a comparatively trivial one, is nevertheless an exceedingly troublesome and undesirable malady to find established in one's stud.

Strangles belong to that large class of diseases known as Catarrhal Diseases, and in this case the membrane lining the air-passages is particularly involved. It is through the mucous-membrane of the nose that the disease generally gains its entrance to the body, although from certain *post-mortem* appearances we may safely conclude that the mucous-membrane of the intestine is also capable of permitting the introduction of the Strangles microbe into the system of the horse. An understanding of these facts will help us to avoid many of the risks of infection.

It may safely be said that a horse's liability to Strangles is in inverse proportion to the animal's age, *i.e.*, that the disease is one confined almost entirely to the young equine, for all of the Equidæ

are probably susceptible to the disease. Many cases of Strangles have, however, been observed in aged animals, and a point of particular interest is that this disease, unlike so many diseases, is capable of transmission to the foal while still *in utero*, in which latter animal the characteristic morbid appearances of the disease have been often noticed. The onset of the disease is easily mistaken for influenza, as the elevation of temperature and physical depression are both marked. Loss of appetite, sore throat, and short dry cough may be noticed in the earlier stages, but the disease generally comes under observation in a more advanced state when a large swelling between the jaws, or under one or both ears, draws attention to the fact that the horse is sick. Often the "dirty nose" is the first symptom to attract attention, but it may be understood that from four to eight days will have elapsed between the actual infection and the first symptom noticeable to the careful observer. If one puts the period of incubation at a week it will be about the average time which this disease takes in manifesting itself.

But little general treatment is necessary in treating an uncomplicated case of Strangles. Avoidance of exposure to cold and wet, with the supply of small quantities of soft and tempting food, will generally be all that is necessary. A warm rug and bandages in cold weather will be good treatment, particularly after the sudden fall of temperature when exhaustion from fever and want of food is most marked.

Surgical assistance, however, may be of great use in shortening the disease, and oft-times will save an animal's life. The plan of waiting for the swelling to attain its maximum size, and become large and soft before surgical interference, is a mistake. Directly one is able to detect "fluctuation," or a sense of softening, in the interior of the swelling, this latter should be opened, as it will be found that the animal's temperature will probably fall as soon as the swelling or swellings have been evacuated; in this way a week or more of the fever—with its heavy tax upon the constitution—will be avoided. The only precaution to be observed in evacuating these abscesses is to make the incision through the skin only (using a sharp penknife, guarded by the finger and thumb, to within half-an-inch of its point). The finger should then be used to separate and tear down the tissue between the abscess and this outlet. The earlier this operation is undertaken, the less dependence we shall have to place upon the knife. This method of evacuating the abscess should be remembered particularly when dealing with those swellings which occur under the ear (parotid region), as here more damage is to be feared to important blood-vessels and nerves by the use of a long or unguarded knife blade. A weak solution of Carbolic Acid or Friar's Balsam should be syringed into the wound if possible daily, and the incision kept open until the discharge has naturally ceased. Fomentations, or the application of blister, will help to induce the early maturity of these swellings.

The copious discharge which takes place from the nose during the last stages of this disease can be assisted by a regular steaming of the head, using Creosote, Eucalyptus, or Turpentine to medicate the hot water. Few cases require further care, and other symptoms must be met as they arise. The attempt to retard or dissipate a forming abscess sometimes results in causing abscess-formation in other parts of the system less accessible to treatment, and in this way abscesses are frequently formed at the entrance to the chest, under the shoulder blade, or even in the abdominal cavity, thereby greatly increasing the risk to the animal's life.

One type of this disease is generally looked upon as conferring immunity upon an animal for the rest of its existence, and this seems practically to be the case, although second attacks are not unknown.

The contagious nature of the disease has long been recognised, and it is, therefore, not necessary to remind my readers that young horses should be carefully guarded against contact with other young horses which appear to be suffering from a "cold in the head," and also from entering premises where the disease has been known to exist.

At a recent sale of Mr. Bowerman's Devons at Capton, Wilton, England, a good many animals, at prices up to 150 guineas, were bought for South Africa.

Rearing Calves by Hand.

AT 8 o'clock on the evening of the 22nd instant—the day on which the Natal Farmers' Conference meets—Mr. George D. Alexander will give a lecture on (1) "The feeding of Dairy Cattle; (2) The rearing of Calves by Hand." The lecture will be delivered at the Y.M.C.A., and if arrangements can be made in time, will be illustrated by lantern pictures. There are but few colonists, if any, who are better qualified to speak on this subject than Mr. Alexander. With few exceptions, the farmers of Natal practically leave the whole of the milking work of the farm to their kafirs. This system, or want of system, with the advance of the dairying industry, will have to be abandoned, or, at any rate, much modified, and the practical information obtained from actual experience that Mr. Alexander may give, should be of general interest, and much value to those who are considering the advisability of following the new departure. His observations on cattle-feeding, especially to those whose climatic conditions are similar, should also prove of exceptional value.

District Reports.

BULWER, 3rd October.—During the last fortnight we have had ideal spring weather, and every thing is flourishing in consequence. There is plenty of young fruit formed on the trees, and if we do not get the scorching hot winds and hailstorms, we should have a good deal of fruit this year in Bulwer. I was told that as we have had several hailstorms during the last successive seasons, we may escape th s season, but I do not feel at all sanguine about this prophecy. Bulwer has given me the impression of being a degree worse than the City of Maritzburg for hailstorms of severity. All kinds of stock and poultry, as far as I know, are free from disease in the Division, Stock is picking up in condition fast. The Marwaqa Mountain is now a beautiful sight, covered w th young green grass from top to bottom. The Native High Court held a Circuit Court here on the 27th September, Mr. Justice Jackson, Acting Judge of the Native High Court, presiding. Two cases of cattle-stealing were dealt with, in which three natives were indited, two males, and one female. The two men were found guilty, and sentenced to two years' imprisonment, with hard labour, and twenty lashes each, and the woman was also found guilty, and was imprisoned for two years, with hard labour. The sentences were the maximum allowed by the law, and should have a salutary effect on sheep-stealing, etc., if anything will. In the absence of the Clerk of the Peace (Capt F. L. Thring, B.M.R.), who has been called out for active service, Sergt. Fothergill, N.P., under deputation of the Attorney-General, ably conducted the prosecutions on behalf of the Crown The Bulwer Rifle Association held its half-yearly prize shooting on the 30th September, but in consequence of the absence of so many members belonging to the volunteers on active service, the attendance was very much below the average. There is a good opening at Bulwer for the following trades, viz., carpenter, shoemaker, wagonbuilder, blacksmith; our local blacksmith being a volunteer has had to go to the front. There is also ample scope for a brickmaker and builder. Lots of buildings require to be taken in hand soon, but there are no tradesmen available. The daily postal service between Bulwer and Maritzburg is now in full swing, and also the bi-weekly between Bulwer and Himeville.

H. W. Boast, Magistrate.

HOWICK, 9th October.—After ten days of rain we have had a spell of excessively dry weather, only 0.80 of an inch of rain having fallen during the past fortnight. However, the weather has been comparatively cool, and free from the hot northerly winds, which, at this season, are often so prevalent as to retard the growth of grass and crops. During the above period the maximum temperature was 92 degress registered on the 2nd inst., and the minimum for the same period was 42 degrees on 26th and 27th ulto. The farmers, who have taken full advantage of the favourable weather, have got the greater part of their land ploughed, and are busily engaged in getting their spring crops in, so that everywhere ploughing and planting are the order of the day. Some of the crops planted earlier in the season have come up, and are looking very well, the early rains having rendered the ground sufficiently moist to enable them to maintain a healthy appearance. The stock throughout the district is in good condition, the grass being amply sufficient for all kinds of stock.

J. W. Cross, Magistrate.

INANDA, 30th September.—Though only 2·03 inches of rain fell here during August, it was a good month, as the rain fell only on four days, and, therefore, in sufficient quantity each time to benefit growing crops, and not be dried up in a few hours after each rain, as happens when the same quantity of rain is spread over a large number of days. The heaviest fall was 0·83 of an inch on August 24th. The maximum temperature during the same month was 99 degs. in the shade on the 6th, and the minimum 46 degs. on the 20th. The mean temperature for the month being 66·1 degs. The past month has been a very favourable one, over six inches of rain having fallen, and everything is looking splendid. It has been the finest spring experienced for many years. Cultivation and cane-planting is going on all over the Division, and all the sugar mills are up to their eyes crushing a bumper crop, and, as the prices of sugar are good, no doubt planters are in high spirits. They deserve a good spell, for, goodness knows, they have had some bad enough years lately to contend with. The mango crop this season promises to be a very fine one. The trees are covered with young fruit, which is looking very healthy. I am unable to say yet what the prospects are for next orange and naartje crop, but what trees I have seen do not seem to have blossomed well. This may be accounted for by the unusually heavy crop the trees bore during the season just coming to an end. Mr. Harry Reynolds, of Oaklands, Umhlali, has succeeded in growing very fine asparagus at his place. I saw about 8 or 9lbs. of splendid shoots from there a week or two since, which I was informed had been raised from English seed. I did not hear after how many seasons, but, judging from the size of the shoots, some of which were nearly an inch in diameter, I conclude that the plants must be several years old to have roots of sufficient size to produce such large shoots. Several swarms of locusts have been about again, but I have not heard of any damage being done by them. Each year, since their first advent in the Colony, they appear to have become less and less destructive. I hope this is a sign of natural decay, which will end in their total disappearance. I am glad to be able to report the Division entirely clear of lungsickness, and stock generally in good health and condition.

JOHN L. KNIGHT, Msgistrate.

N'KANDHLA, 30th September.—A week's heavy rain fell during the middle of the month, doing a lot of good. Since the rains the weather has been quite warm. I am pleased to report that the lungsickness has made no headway, and appears to be dying out. The stock inspector visited the district on the 17th instant. All stock is picking up in condition, and the grass is coming on well. It was with regret I had to record the death of the Chief Mbambai of the Ranyale tribe on the 2nd istant. In the inland parts of the district cultivation is going on, but all along the border of the Transvaal it has ceased, in consequence of the Boer attack on the 26th instant. I have had no reports regarding locusts during the month. The health of the district on the whole has been good.

C. C. FOXON, Magistrate.

NQUTU, ZULULAND, 1st October.—During the past month the rainfall registered about three inches. This is unusual, and shows that we are to have an early spring. Were it not for the very troubled condition of affairs hereabouts, ploughing would now be the order of the day, but until affairs military are more settled, I fear that the natives will not do much towards ploughing and planting. On the 22nd ultimo the Boers made a raid into the District, and the result was that some 300 head of cattle and 600 sheep were looted. These raids, from which the District has suffered for the past year, have the effect of upsetting all the good work of the Stock Inspector as in the rush to bring stock into a place of safety, the infected stock travel about and become mixed with the clean stock. All kinds of stock are just beginning to pick up, as the grazing is coming on splendidly, and the animals able to obtain their fill.

C. HIGNETT, Magistrate.

WEENEN, 4th October.—The works in connection with the new water furrow on the Weenen Town Lands were commenced some weeks ago, and satisfactory progress is being made. The contractors, Messrs. Worthington and Walters, are experiencing some difficulty in obtaining sufficient native labour, but this deficiency will, no doubt, be remedied when the works become better known. The pea crop—one of the staple products of this District—promises to be a remarkably fine one this year, and will soon be ready for harvesting. One or two extremely hot days, with a strong north wind, have been experienced this week, and another shower of rain would be welcome.

C. G. JACKSON, Acting Magistrate.

The custom of docking was given up in Army stables so long ago as 1764.

He was a Sydney Technical College man, and was supposed, never having had any practical experience of the business, to have a deep and valuable knowledge of fowl rearing and breeding. Therefore, the authorities sent him up-country to lecture to the folk who were trying to make a living at the industry. His first audience numbered many young people, to whom he procceded to give what he called "wrinkles" in their work, but which most of them had been familiar with from their cradle. "Now," he went on, impressively, "a hen has laying capacity to the amount of 600 eggs, and no more. But in five years she finishes her task, and the important question arises as to what we shall do with her?" "Why, mister," exclaimed a boy, "any fool knows that. Cut off her 'ead, an' sell 'er for a spring chicken. What else could be done? Tell us somethin' we don't know please, mister."—*Pastoralists' Review.*

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of September, 1901 :—

Name of Colliery.	Labour Employed. Above Ground. E.	N.	I.	Below Ground. E.	N.	I.	Coal raised. tons.	cwt.
Natal Navigation	14	30	150	10	210	180	10,413	0
Dundee Coal Coy.	15	20	105	12	149	296	8,862	0
Elands Laagte	11	20	135	11	130	280	8,658	0
Natal Marine	10	128	20	7	323	4	8,449	4
St. George's	10	92	17	5	159	1	5,011	0
Natal Steam Coal	3	42	8	2	96	1	1,720	0
Crown	12	41	3	4	118	2	1,612	0
Newcastle	4	17	13	4	117	0	1,561	10
No. 42	11	35	17	3	66	0	1,492	0
Dudley	6	35	2	1	20	0	791	10
Inkunzi	2	12	0	1	38	0	496	12
West Lennoxton	2	8	6	1	7	29	318	0
Hillside Colliery	0	8	0	1	4	0	40	0
Central	14	98	3	1	17	0	22	0
Total	114	586	479	63	1,454	793	49,447	1
Corresponding month, 1900 ...	68	375	301	44	1,452	578	40,351	0

Mines Office,
October 9th, 1901.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of September, 1901 :—

	tons.	cwt.
*Coal Bunkered	*20,674	13
Coal exported to Cape Colony	7,374	11
„ Delagoa Bay	228	8
Total	28,277	12

*Included in this item are 1,318 tons of Imported Coal.

Custom House, Durban, 30th September, 1901.

GEO. MAYSTON,
Collector of Customs.

Meteorological Returns.

Meteorological Observations taken at Private Stations for Month of September, 1901.

STATIONS	TEMPERATURE (In Fahr. Degrees). Means for Month. Maximum.	Minimum.	Maximum for Month.	Minimum for Month.	RAINFALL (in inches). Total for Month.	No. of Days.	Heaviest rainfall in one day. Fall.	Day.	Total for Year from July 1st, 1901.	Total for same per'd from July 1st, 1900.
Estcourt	...	...	85	31	2·31	8	·70	14th	3·76	2·52
Nottingham Road ...	...	...	.	...	4·14	14	1·03	14th	6·18	...
Adamshurst		...	87	42	2·97	13	·87	15th	4·45	...
Hilton	...	...	93	41	3·84	15	1·07	14th	5·82	3·11
Ixopo (Gerton) ...	...	...	90	48	1·94	8	·57	15th	2·58	2·95
Mid Illovo (Ismont)...		...	89	43	5·21	11	1·14	19th	8.19	4·51
Ottawa	...	...	...	...	6·29	11	2·13	20th	8·36	5·17
Mount Edgecombe ...	...	...	99	53	7·28	11	2·09	20th	10·01	4 92
Cornubia	..		...	...	7 22	...	...	...	9 76	5·89
Milkwood Kraal ...	...	...	.	...	5 ·8	...	..	...	7·29	3·37
Blackburn	...	...	..	...	6 03	...	...	...	7·96	4·85
Saccharine	...	...	...	...	7·29	...	...	...	9 76	5·18
Prospect Hall... ...	...	...	...	...	5·74	...	...	...	8·81	...
Clairmont	...	...	...	...	7·50	11	1·85	15th	10·37	...
Equeefa	...	...	100	52	7 22	13	2·29	11th	9 48	4·15
Umzinto (Beneva) ...	...	...	.	...	7·23	11	1·71	20th	9·44	4·09

Correspondence.

To the Editor Agricultural Journal.

THANKS.

SIR,—Absence from home prevented my thanking, in due course, Messrs. Pearce and Pardy for their letters in No. 14 of the *Journal*.

In now thanking them, I have to say that the explanations given have made the matter I wrote about much plainer. Mr. Pardy accurately measures my mistake.

I would like to ask, in this place, why can there not be a little more plain sailing when stating constituents of manures?

To a layman, chemistry is nearly as bad as Greek, and when one hears of "muriate," "chloride," and "sulphate" of potash, pardon should be given for getting a bit mixed.

To me it seems more understandable to say that "Kainit" contains "13 per cent. of pure potash," than to say it contains "25 per cent. of sulphate of potash."

The kindly spirit in which the above letters have been written will do much to embolden farmers to ask questions when they do not understand things.

Yours, &c.,
JAMES THORROLD.

The Moorings, Sunday's River.

HORSESICKNESS.

SIR,—I read in two issues of your *Journal* articles by Mr. Pitchford, Principal Veterinary Surgeon, and by Mr. A. Theiler, Veterinarian to the late South African Republic, on the disease known as horsesickness.

I would like to ask Mr. Pitchford, through the *Journal*, why *so few* (if any) foals, yearlings, and two-year-olds die of the disease. I have been breeding horses for about 23 years, and cannot remember losing one of the ages I have given by the said disease. I have at different seasons lost considerable numbers of grown horses of both sexes. All (old and young) have run together in the veld.

Yours, &c.,
W. HENWOOD.

Rosetta.

This is an interesting point which has not escaped observation. Youth undoubtedly possesses a great degree of immunity, which lapses with advancing age. I have, however, seen yearlings succumb to the disease in two cases. Why certain diseases should be incidental to certain ages, such as measles to youth, or cancer to more advanced age, is still one of the unsolved problems of preventive medicine.

All observations and speculations on the disease are welcome to me, especially when coming from those having the extended experience of Mr. Henwood.

H. W-P.

RINDERPEST QUESTIONS.

SIR,—Can anyone tell me if serum would be any good taken from cows immuned with bile and virulent blood two or three times, and which had rinderpest three years ago?

Would the cows contract rinderpest if, after taking the serum, they should be fortified with virulent blood?

Would the immunity of cattle, which have been inoculated with bile and virulent blood, break down if rinderpest should break out in young stock or other cattle (born after the last rinderpest outbreak) in the same troop?

The cattle in question were inoculated four years ago, and went safely through rinderpest three years ago, the immunity only failing in one or two cases.

Yours, &c.,
H. F. RAW.

Rooi-de-Vaal, Harding.

To the foregoing the Principal Veterinary Surgeon, Mr. Watkins-Pitchford replies as follows:—

In reply to this letter from Mr. Raw, I am not able to state definitely that animals immured with bile—without suffering from the disease—and subsequently treated with virulent blood, would contain in their systems to-day any great degree of immunity. All that I can say is that it is not probable that their im-

munity will in any degree equal the immunity of those animals which suffered and recovered from a severe attack of the disease. It is stated that these animals, in addition to the above treatment with bile and virulent blood, "had rinderpest" three years ago; if this is the case, we may be safe in concluding that they are likely to withstand contact with the disease.

We have no sound reason for considering that the blood of an animal which recovered from rinderpest some years ago still retains its anti-toxic properties, although a strong immunity may remain, and I am of the opinion that we shall do well not to trust to any great extent to the serum of animals recovered at such length of time, even after they have been subjected to repeated injections of virus. This latter would doubtless increase their immunity, but it seems to me improbable that it would evoke in the animal's system an elaboration of that curative anti-toxic principle upon which we depend in the serum-cure.

The immunising and the anti-toxic principles of a disease should not be confused, as they are often separate and independent manifestations induced in the animal body by disease-attack.

CANE CULTIVATION BY PLOUGH.

SIR,—In the report by "Ergates" of his "Chat with Mr. A. Wilkinson," he speaks of the work of the sugar estate being done with ploughs, not hoes. Does that mean that the cane is planted in plough furrows instead of holes made with hoes? If so, could you give me more particulars as to mode of procedure, *i.e.*, depth of furrows, distance between; are the cane sets continuous; how many sets side by side in furrow, etc.?

Also can you tell me where particulars of the Yaryan Evaporators can be obtained, and who supplies the "Oliver" hillside plough?

Yours, &c.,

C. H. MITCHELL.

Mr. Anthony Wilkinson kindly supplies the following answers to the above questions:—

The land is first ploughed with an Oliver plough by ten or twelve oxen. It is then harrowed, lined off, and small furrows 4 feet 6 inches apart, in which mealies are sown, are ploughed. When the mealies are up two or three feet, peas are drilled in between the rows. When the mealies are off the plough (Oliver) is run along the mealie lines, or, if the pea vines are so thick as to choke the plough, cane holes are made with hoes. The depth of furrow or hole, or hole made in furrow, is 9 inches to 10 inches. Two or three cane plants are put in each hole, which is 2 feet long, and the holes are 2 feet apart from end to end. When the cane comes up it is hand-weeded and hand-hoed till 2 feet high. It is then cultivated with horse-hoes and scarifiers as long as the animals can get between the lines.

For "Oliver" ploughs enquire of Messrs. Parker, Wood & Co., Durban.

The Yaryan Evaporators are made by Messrs. Mirlees, Watson, and Yaryan, Glasgow. Agent in Natal, W. J. Mirlees, Esq., The Club, Durban.

Stramonium for Horse Flies.

MR. J. MEDLEY WOOD, A.L.S., has been good enough to forward the following, which is extracted from the "Pharmaceutical Journal" of August 17th:—

According to the "Chasseurs Illustré," a decoction of one part of stramonium leaves to three parts of water, boiled for twenty minutes, and applied, when cool, to the face, about the ears, inside the legs, about the belly and croup, is sufficient to keep a horse free from its tormentors during a whole day. Stramonium is said to be much more efficacious when thus used than tobacco.

An unusual race was advertised to be run at Ripon, in Yorkshire, in 1725: "The Lady's Plate of £15 value, by any horse that was no more than five years old the last grass. Women to be the riders; each to pay one guinea entrance. Three heats, and twice round the common for a heat."

Frozen mutton continues to show firmness in the London market. Australian heavy-weights are unchanged at 2⅜d.; but light-weights have risen ⅛d., and are now quoted at 2¾d. River Plate mutton is quoted at 2⅝d., or an advance of 3-16d.

Discing Lucerne.

IN the *Queenslander* "Koradji" writes: Recent experiments in running a disc harrow through lucerne crops have shown that the plants receive a considerable benefit from the process. Frequently lucerne becomes choked with weeds, especially after the crop has been existent for some years. Its vitality becomes more or less impaired, and the weeds in consequence gain the ascendency. Lucerne, as is well known, sends its roots deeply into the ground, when the soil is suitable, and the cutting of the shoots in no way affects the permanency of the plants, but on the contrary improves their vitality, notwithstanding the fact of their being cut a little below the surface of the ground. The blade of the plant is a net-work of fine ducts in which is circulating the nourishment which the blade draws from its root, and which dries up infallibly when separated from it. By cutting occasionally the plants are prompted to greater vigour, and a more prolific crop ensues.

A writer in the *Prairie Farmer* states that his first experience in discing lucerne was in the year 1898, in a field that had been seeded in a dry year some four years previously. The land, which was not altogether suitable for a good crop of lucerne, had been heavily pastured by hogs. When the hogs were taken off a heavy crop of crab grass came up. This came so thick among the thin lucerne that the crop was not considered worth keeping. The field was subsequently harrowed with a disc harrow, the discs being sharp and set at as great an angle as possible. It was immediately crossed —disced with the disc set the same way. The ground was thoroughly pulverised, and the lucerne apparently destroyed. It soon, however, started again, branched out thickly, and during that summer three good cuttings were taken off the field. Encouraged by the success of the experiment, the writer goes on to say that the year following, which was very dry, two fields two years old were disced. One field disced on 28th March had the first cutting taken off on 31st May. It was again disced on 6th June, the second cutting being taken off on 25th June; disced again on 27th June, the third cutting was taken off 13th August. The lucerne was disced for the fourth time on 20th August, the final cutting being done on 13th September. Thus giving four discings and four cuttings of lucerne on upland in a dry year. As this experiment was made in Kansas, in America, the climatic conditions as to the months which the discing and cutting was done would vary somewhat from those in this country, but the general principle should apply as well here as there.

A harrow with sharp sixteen-inch discs was used, the discs being set at right angles, just sufficient to turn the soil over. The harrow was weighted to make the discs split the lucerne crowns to a depth of two inches. The discing, splitting the lucerne roots, made them throw out many new shoots, and also made an earth mulch over the field, thus preventing the evaporation of moisture, usually rapid after a dry time, when the lucerne has just been cut. The discs were set so that they barely turned the soil over, and running at a depth of two inches they turned the roots of the grass and weeds up to the sun, which killed them. It appears that it is safe to disc lucerne after it is two years old. It is perhaps advisable to make the first discing in the early spring, and then disc immediately after each cutting. Should the crop be fair to good, set the discs as described, but if a poor crop set the discs deeply, specially if the grass and weeds are thick. It is held that discing is as much value to lucerne as cultivation is to corn.

Mr. George Hodgman, in his amusing book "Sixty Years on the Turf," recently published, describes a curious race at Ascot in 1853, which put a very large sum into the pocket of Davies, the "Leviathan" bookmaker. Four horses, Sittingbourne, The Reiver, Filbert, and Nutpecker, started in the Fourth Triennial Stakes. The last-named two carried no money at all, but there was heavy and sustained gambling over the other two, and Davies laid against them till backers were exhausted. As soon as the flag fell, Sittingbourne and The Reiver, instead of racing, reared up, then rushed at each other open-mouthed, fighting like wild beasts. The result was Filbert won easily. Mr. Hodgman observes that the incident stands unique in Turf history.

Report on Irrigation in Natal.

By Colonel F. V. CORBETT, R.E., Irrigation Expert.

THE following is a report, dated 6th February, 1901, by Colonel Corbett, on irrigation in Natal :—

The Colony of Natal has generally an elevation above sea-level of something over 5,000 feet on its N.W. frontier, reckoning from the foot of the Berg. The distance of these uplands from the coast varies from 100 to 125 miles. The average fall from the uplands to the coast is, therefore, not less than 40 to 50 feet per mile. The rainfall is generally moderate as regards its total amount, but, I understand, frequently very violent for short periods. The natural result has been wholesale erosion and denudation, increased, no doubt, by the absence of forests. Dr. Sutherland, in his pamphlet on the Geology of Natal (1868), alludes to "the great valleys of the Tugela and its tributaries, where that river has hollowed out its bed to such a depth that at a distance of 40 miles from the sea the elevation is under 600 feet, although the average elevation of the land on both sides the valley is nearly 4,000 feet."

2. This very broken conformation of the country, and the general steep slope from which it results, are greatly against the introduction of any general public scheme of irrigation. There are few, if any, large tracts of good arable soil ; the waters rapidly find their way to the sea, and there are no natural basins or lakes, either perfectly or imperfectly formed, in which they can be stored. It is just possible that there may somewhere be a good site for an irrigation reservoir in Natal, but I have not yet succeeded in finding one. Of course, it is impossible to be certain without a survey, and I hope to be able to recommend some site for preliminary survey. But there is no use going to the expense of even a preliminary survey except for a site that commands a sufficient area of suitable soil.

3. Though there is such a poor prospect for public irrigation schemes, the country seems, on the whole, fairly well watered in years of normal rainfall, and there are many springs and "spruits," or rivulets, more or less permanent. (I says *seems*, because my opportunities of personal observation have been confined to the very dry years 1899 and 1900. There is good reason to believe that the volume of water available in 1900 was not more than one-third to one-half of the normal.) Many of these sources of irrigation have been taken up, and, as agriculture and railway communication develop no doubt all will be eventually utilised, where no great difficulties intervene. I understand that agriculture, beyond the raising of "mealies," has only quite lately been attempted in Natal ; also, that locusts, rust, and other plagues besides drought, as well as political matters, have greatly retarded its progress.

GOVERNMENT CANALS—WEENEN.

4. The only "public" canal, made by Government, is at Weenen, where some 700 acres of "thorns" land are commanded by a channel taken out from the Bushman's River. A trial line has lately been laid down on the ground for a second canal on a higher level, to command nearly 2,000 acres, and as there is plenty of water for both, this channel should be constructed as soon as possible, if the estimate shows that it can be done at a cost that can be recouped by the lease or sale of the lands put under irrigation. There is some awkward cross drainage to provide for, and the works for this purpose should be of a substantial and permanent nature, otherwise the cost of maintenance may be very high. At present the existing canal gets too liberal a supply of water, and the lower parts of the land under it are inclined to get water-logged ; some signs of alkali have appeared on the surface. This matter should be looked to and a drain cut if necessary. If there is any delay in the construction of the new furrow, some limit should be put on the volume to be carried in the existing one, which should eventually be re-modelled to carry a smaller volume.

5. This (Weenen) is the most favourable combination of climate, water, and soil that I have met with in the country, and the difficulties of finance are removed by the fact that the land belongs (or belonged, in the case of the running canal) to the

Government. It is a question whether it would not be better to lease the land instead of selling it; by this means Government would be more certain to obtain ultimately the full value of the water, and could raise rents so high that the lots could only be held by men who farmed highly and made the most both of land and water. On the other hand, the sale of the lots at the outset relieves the Government at once of all financial burden.

6. I must take this opportunity of pointing out that the construction of the "upper furrow" will be a very different job to that of the existing channel, on which the natural conditions were specially favourable. Very complete surveys and working drawings are required before an estimate can be prepared, and this estimate, with the drawings of every work, must be examined and passed by a competent and responsible Engineer before any lots are sold or leased, or any expenditure incurred, except for survey and estimate.

7. In some similar cases in the Cape Colony the land has been sold at prices varying from £10 to £53 per acre, and a charge of 1d. per 1,000 gallons made for all water supplied. This comes to over 30s. per acre per annum for water, and is probably more than should be charged in Natal. But I have great doubts whether it is right to supply water without a charge. In the case of the old furrow, a large unearned increment has accrued to purchasers of lots, and though this will run up rates at the next auction, it is not likely that the real value will be realised.

8. Before the new furrow is completed, some bye-laws must be introduced to provide for the division of the available supply between the two channels, as well as for distribution between the several irrigators on both. Outlets must be of fixed sizes, and times must be laid down for opening and closing each outlet. The "roster" for opening and closing would not be always in force, but would be brought in when the supply in the river gets low.

Colenso Flats—Proposed Tugela Canal.

9. A portion of the so-called "flats" in the neighbourhood of Colenso, on the right bank of the Tugela, might, no doubt, be irrigated from the Little Tugela, and some water from the main river might possibly be brought into the Little Tugela above the head of the canal. The latter, even if possible, would be expensive. The Little Tugela may, I think, be generally depended on for 100 cubic feet per second below the junction of the Sterk Spruit in the winter, though this year (1900) it was considerably below that. The head of the canal would probably be a little above the bridge, at the site shown to me by Mr. G. C. Williams, in 1899.

10. Before attempting a survey for such a canal, it is necessary to fix upon an approved means of financing tho scheme. It is not safe for Government to make a canal and seek to recoup itself by merely charging a water-rate per acre irrigated, or per unit of water used; there are few countries where this can be done. In the Hartz River Valley Scheme, in the Cape Colony, it is proposed to acquire by purchase a considerable area of land, to sell it, after making the canal, at an enhanced rate, and to charge a rate of 1d. per 1,000 gallons for water used for irrigation. In this scheme it was assumed that 400,000 gallons would be consumed for the irrigation of one acre; this makes the rate 33s. 4d. per acre, which is probably too high for Natal, but a lower rate might be charged. I can think of no more suitable plan for financing the Colenso Flats Scheme.

11. Probably about 5,000 acres could be irrigated. The canal would be something like 20 miles long, with perhaps five to eight miles of minor channels, possibly more. It is impossible to guess the cost, but it would probably be between £35,000 and £50,000. Taking 5,000 acres and £50,000 cost of construction, we get a rate of £10 per acre, which is about the same as that of the Hartz River Valley Scheme.

12. Everyone says that wheat can be grown in this soil; in any case, one or more grist-mills might be constructed on the canal. Drainage will cross the line throughout the whole of its length, but this is unavoidable, and if the main crossings are provided for by strong works of ample waterway, the annual maintenance charges should not be very heavy. I fear there is little chance of economically storing any of these cross drainages with a view to increasing the supply.

Umgeni Project.

13. Mr. G. C. Williams brought to my notice in 1899 a promising scheme for bringing the water of the Umgeni down to Pietermaritzburg from the railway bridge above Howick, thus providing water supply and power for the City, as well as irrigation for some very good soil below Otto's Bluff. He has since more publicly mooted the scheme. There are certainly some very excellent lands that would be brought under irrigation—some thousands of acres—and the Umgeni would at its worst give ample water for water supply, and the surplus of power water could, perhaps, be used for irrigation. The drawbacks to this scheme are the long distance that the water has to be brought before it begins to be remunerative and the somewhat uncertain supply of the Umgeni under the worst circumstances of drought. It has certainly sometimes been as low as 50 cubic feet per second in 1900, but I do not think it has been sensibly lower. The ordinary minimum may probably be safely taken at 100 cubic feet per second. The canal will have to pass through more than 25 miles of country, much of it difficult, before it begins to irrigate; the loss in this length must be very considerable, not to speak of the cost. On the other hand, there seems reason to believe that such a season as 1900 is not likely to occur very often, and even in such a season there would be amply sufficient for water supply. As to power, I have no data. If, then, it is approved as a scheme for water supply and power, the survey should be carried out. As a purely irrigation project, I do not think it would pay, though I should be sorry to see it finally shelved without any further investigation.

14. I know, as yet, of no other projects for public canals that could be suggested for the consideration of Government.

Shallow and Porous Soils.

15. Much of the soil in Natal is very shallow. Over a large area is found 8 or 10 inches of loam over shale, and the upper 3 or 4 inches of this shale is very much broken up. Sometimes under the loam there is a band of some three inches of fine gravelly stuff. In either case, it is evident that the subsoil is exceedingly porous, and that if water is run freely on to it for irrigation, not only is an enormous depth of water used on each acre, but the soluble plant-food in the soil must be partially washed away. The difficulty can be got over to some extent by the use of pipes, troughs, or hose, which involves considerable expense. If it is found that the underflow is not too deep to reach the roots of the crop, irrigation may possibly be effected by running the water down parallel furrows at a suitable distance apart, without attempting to spread it over the surface of the field. The porosity of the soil is greatly diminished after the first watering, and each watering must be conducted according to its own special conditions.

Furrows from Spruits.

16. Most of the permanent "spruits," *i.e.*, those that run throughout the dry season, can be, and frequently are, utilised by taking out a small furrow to the nearest suitable land. Frequently, however, the land where the water is desired is a considerable distance from the spruit, and it may be doubtful whether it can travel so far without losing most of its volume. In a case in Mid-Illovo, a small stream, sufficient for about 20 acres, could have been used on the spot, with no expense whatever, on a suitable tract of moderately sloping ground, but the owner did not wish to cultivate, and if utilised at all it will have to be taken about a mile by another farmer, and carried across a valley by a siphon pipe. It is doubtful whether this will pay. In most of the cases that have come before me of taking out small furrows from spruits and small rivers, there have been no great difficulties in the way. In the case of the Mooi River, the available supply is already, by all accounts, pretty well utilised by several small channels.

Diversion Reservoirs.

17. The imperfectly permanent spruits, *i.e.*, those that are liable to fail more or less in the course of the dry season, can very generally be made available for irrigation. There are probably few farms on which one or two acres of irrigation cannot be secured in this way. A furrow should be taken out from a suitable point on the spruit, and led to a suitable slope (1 in 1,000 to 1 in 500, or possibly steeper

if the soil is rocky) to a reservoir formed on the side of a hill. The reservoir can be filled, or partially so, with every considerable shower of rain, and in normal seasons it can do very fair work. In a bad drought it will prove a broken reed, as its storage capacity cannot be great, but on the whole it can give considerable help. Several of such reservoirs can sometimes be made on one farm, and possibly more than one from the same spruit. It is not, indeed, absolutely necessary to start from a defined channel; the water may be picked up from the side of a hill by a catchment drain. But it is evident that such supplies depend on the occurrence of heavy showers, and such a system is very precarious. The more useful diversion reservoirs will be fed by spruits which are more or less permanent in ordinary years.

Dams Across Ravines.

18. Many farmers have proposed to dam the main drainage lines with a view to storage. This is seldom to be recommended, especially where the slope of the country is so great as it is in Natal. It is difficult to place any limit on the magnitude and force of the torrent that may some day come down, and unless expensive scouring sluices are made the reservoir is liable to be silted up very soon. Sometimes the catchments are so rocky that there is no great fear of silting, and then, with a good waste weir over natural rocky ground, it may be possible to store water for a few acres at a moderate cost.

"Karez."

19. The "Karez," or irrigating tunnel of Biluchistan, might possibly be adopted in Natal: there are some sites where water could be procured by this device, but it is, of course, necessary first to find the plot of good soil on which to utilise the water. The "Karez" is, certainly, a possibility for the future if labour is cheap enough—a very important condition.

Irrigation by Lift.

20. Generally speaking, and with few exceptions, the physical conditions of Natal render gravitation schemes of any considerable scope unattainable. Given a plot of suitable land, the cheapest way to irrigate it may often be to pump from a spring, well, or river, say to a height of 10 feet† to 40 feet for ordinary crops, and up to 100 feet or more for specially valuable crops, such as tobacco and sugar-cane. But no pumping will pay without good soil and cheap carriage to a market.

Animal Power.

21. The "Noria" pump is a bucket-and-chain arrangement, well known, I believe, in the Cape Colony as the "bakkies" pump; it is very effective for it lifts from 10 feet to 30 feet. In September, 1899, I recommended the purchase by Government of one capable of irrigating about 25 acres in the month, to be worked by oxen, horses, or mules. It was to cost about £60, and to be let out to farmers at £2 per month. The proposal was not accepted, but it might be again considered, if several farmers express a wish to try it, as it may encourage them to purchase one for themselves after its efficiency has been actually and practically demonstrated. But present conditions are unfavourable for the use of animal power; live stock should be plentiful, which is not now the case.

Boring and Testing for Wells.

22. It is also desirable that farmers should have some means of ascertaining when necessary what is likely to be the cost of excavating wells for irrigation. For this I lately suggested* the purchase of a boring plant to bore down to 100 feet, with a force pump for testing† the supply of water in the boring. This proposal also was not approved. The plant, if it should ever be purchased, should be under the control of the Commissioner of Mines.

Wind-Engines.

23. Windmills or wind-engines, are used, to some extent, in the Cape Colony. From Wallace's work (1896), I gather‡ that he did not consider that they had been successful there, but I agree with him that they must succeed in time. I have no experience of wind-engines, and on reading all that I can find about them

* This was originally suggested by Commissioner of Mines in 1899.

† A partial test except for small volumes.

‡ "Although wind-power has been on the whole a failure in South Africa, it must not be taken for granted that ultimate success cannot be achieved by it.'

I am confronted with most contradictory opinions. One authority considers that "irrigation supplies can be more economically pumped by steam-power, even with dear coal." Another, who has paid special attention to the subject, proves that a well-designed wind-engine is the most economical prime mover for such purposes as do not require continuous and unbroken action. Windmills are largely used in America, where there is, perhaps, a more general knowledge of mechanical details than there is in this Colony. Mr. F. R. Johnson, in his remarks on Wells and Pumping, in the Special Report on Irrigation in Cape Colony, 1899, gives, as an instance of what is being actually done in that Colony. "Wind-engine, 40 feet diameter, irrigating 30 to 50 acres, with 20 to 40 feet lift, at a cost of from £2 10s. to £3 per acre, allowing for interest, depreciation, and repairs." In America, smaller windmills appear to be chiefly used, irrigating from 2 to 10 acres.

Steam Pumps.

24. I have recommended pumping by steam for sugar-cane flats near the coast, with a lift of 12 to 25 feet. Gwynne's Invincible Centrifugal Pumps are, in my opinion, the most suitable, and sugar planters, who have competent mechanics at hand, will find no difficulty whatever. Whether steam-pumping will pay up-country is another question.

Hydraulic Ram.

25. A properly designed hydraulic ram may sometimes be very successful in Natal. The circumstances suit it, as the necessary working fall can generally be obtained, while it requires very little attention when it has been once properly set up. The ram has not, to my knowledge, done much yet in this country, but the engines generally used are not sufficiently powerful for irrigation. Mr. John Blake, of Accrington, who supplied the rams for the Estcourt Waterworks, has lately sent an agent to South Africa, and I shall soon be able to learn approximate prices of suitable engines. From one estimate lately received, I find that the cost of irrigation by ram, with a moderate lift of, say, 40 feet, is something less than £2 per acre, on the basis of 10 per cent. of cost of engine for interest, depreciation, and repairs.

26. Pumping at £2 per acre will not pay everywhere; all the circumstances must be favourable.

General Remarks.

27. There must be sites for many scores of small canals, and these, no doubt, will be made in the course of time, but they are so small in scope that it is almost impossible that they should be suggested or brought forward except by the owners of the lands to be irrigated, or by others interested in those lands. As yet, however, cultivation is so little advanced that, during the very dry seasons of 1899 and 1900, I have only had about 58 applications for advice about irrigation, and the conditions of the country are such that it is seldom possible for me to originate an irrigation scheme. In some countries, where there are broad and fairly level and unbroken tracts, a general scheme may be prepared from without; but in Natal the owner of the land must initiate, at least so far as to point out to the Engineer the lands that he wishes to water.

28. Irrigation may be considered as serving two purposes, alleviating the effects of drought and raising crops in the naturally dry winter season. In the first case, the drought greatly affects the supply available for irrigation, and in Natal there are no perrenial mountain snows, no extensive swamps, or other natural means of storage; while, for reasons before given, the country is not suited for works of artificial storage. Thus, irrigation works in Natal will, to some extent, fail as a substitute for natural rainfall, though the supplies in the main permanent rivers will not give out altogether. In a dry year, the proposed works on the Bushman's and Tugela Rivers will irrigate, on the whole, about as much as usual, because they will be used in both seasons, but the "diversion reservoirs" will fail, and the furrows depending on "spruits" will give a reduced supply or fail altogether during part of the year. Until irrigation is much more developed, the few small furrows from the larger rivers, which take only a small proportion of the river's supply, will be useful and efficient to their full scope, and pumping from the beds of permanent rivers will generally give full results. When irrigation has

been more fully developed, either of these two sources might fail to some extent in the lower reaches of the rivers.

29. We may, I hope, look forward to some period in the future when the afforestation of some of the many bare acres of Natal may have had some beneficial effect on the permanence of the supplies of water on and near the surface of the country. But the future of such afforestation is doubtful, as is also the degree of advantage that might be gained from it in this direction.

29A. The question of periodical grass-burning is one that, with my limited experience, I can at present only briefly allude to as necessarily affecting the hydrographic condition of the country. I believe that some writer has even suggested that it is responsible for the diminished rainfall of late years.

29B. It is hardly necessary to remark that agriculture cannot be developed to any great extent, either with or without irrigation, without railways.

Legislation.

30. The question of legislation with regard to water-rights should be borne in mind, though, perhaps, it will be well to wait a year or two, unless the necessity for it comes prominently forward. This question has lately been so fully dealt with by Mr Ham. Hall for the Cape Colony that I will not now enlarge upon it. After analysing the water-rights and laws of all nations, he makes two distinct recommendations to the Cape Government :—

(1) To provide for a water-supply and irrigation survey.
(2) To provide an Act to define water-rights and to provide for administration and organisation of irrigation matters.

Mr. Hall drafted a very complete Act, on the lines recommended in his report, but the Government decided to begin with the minimum of legislation, and to allow it to develop gradually. Accordingly, a short Act was passed in October, 1899, providing for the establishment of Water Courts for the administration of irrigation works, also for advances to Irrigation Boards. Very much the same measures will, probably, be advisable for this Colony, but I would prefer to postpone definite recommendations in this direction as long as possible.

31. Recommendations as to the future action of the Government with regard to irrigation generally, surveys, gauging of rivers, etc., will be made later on.

Recommendations for the Present.

32. For the present I recommend as follows :—

(1) Ascertain the approximate rate per acre that it would cost to acquire the land about the "Colenso flats" likely to be commanded by the proposed Tugela Canal.
(2) If the land can be purchased at a reasonable rate, make a preliminary survey of the line of canal and prepare a sketch estimate.

Further procedure will depend on the results of the above operations.

(3) If enquiries establish the fact that a plant for boring down to 100 feet for water would be welcomed by the farmers in Natal, and suitable fees paid for its use, such a plant should be purchased, with a force pump. This plant should be under the charge of the Commissioner of Mines, who originally proposed its purchase, and who has a staff to look after it. Cost not above £100.
(4) If enquiries establish the fact that it would be rented, purchase a "Noria" pump for about £60 or £70, suitable for animal power—horses, mules, or oxen—charging a suitable fee, perhaps £2 per month, or something less.
(5) I think that wind-engines should be given a fair trial, but postpone recommending the purchase of one until I can name the pattern and price.

(To be continued.)

Since the middle of the nineteenth century the annual production of cheese in the United States has risen from 100 million pounds to 300 millions, of which 96 or 97 per cent. is made in factories. From 30 to 50 million pounds are exported annually.

A Handy Cyaniding Plant.

MR. F. G. WALKER, of the Sherwood Orangerie, Coomera, in response to a request from a subscriber, has kindly supplied us, *The Queenslander*, with the subjoined description and sketch of his cyaniding apparatus, which was constructed after the pattern of one which he saw at the orchard of Mr. Collins, of Redland Bay. Mr. Walker expresses the opinion that this method of using cyaniding sheets will be the means of saving pounds to those who have many fruit trees, as compared with the plan practised and advocated by the Department of Agriculture. Mr. Walker and his son can do twenty-two trees in one night, with three sheets, the largest of which is 60ft. in diameter, and octagonal in shape, if the night is favourable. Of course a third man or a boy would make the work easier.

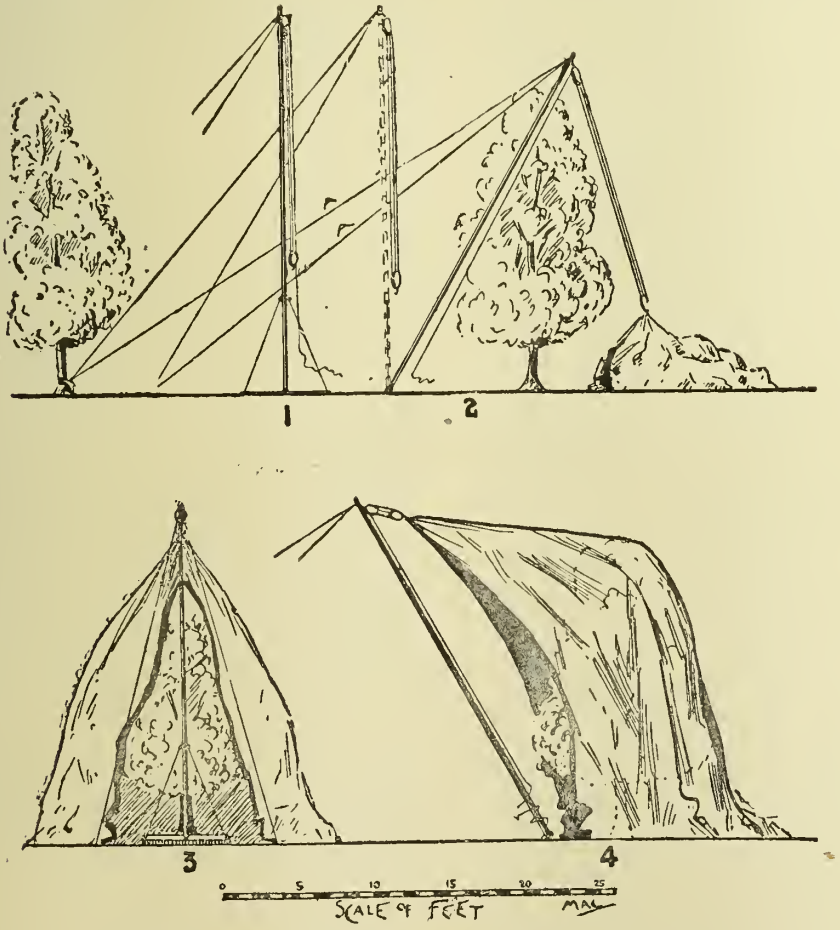

Diagram No. 1 shows the bamboo pole used in hoisting sheet. It is 26ft. long for trees of about 20ft. in height; of course larger trees require longer poles. It is set into a base 6ft. x 6in. x 2½in., stayed as shown in sketch by two iron rods (held in position by an iron collar, and also two guys of wire or hemp rope). The blocks and ropes, by which the sheet is hauled up, are suspended from the top.

No. 2 shows the pole in position, with sheet marked X on the ground at foot of tree. AA guy ropes attached to trees at the rear, by which the sheet is pulled

over the tree as in sketch No. 3; then by pulling on each side of the sheet it comes easily and swiftly round the tree as in sketch No. 3. Mr. Walker's sketch showed only one guy rope, set fairly behind the pole and tree.

No. 3 shows the position of the sheet when hauled over by the guy ropes

No. 4 shows the sheet just before final lowering by letting go halyards.

The above plant could be worked by a man and strong boy.

Mr. Walker's letter drew the following letter from "a regular subscriber" :—

In your issue of the 9th instant I notice a description of "A Handy Cyaniding Plant" as used by Mr. F. G. Walker, of Sherwood Orangerie, Coomera. I admire Mr. Walker for his generosity in making known such a useful method to his brother orchardists. At the same time, I trust he will pardon a few corrections and accept a few suggestions from one who has had considerable experience in the method he has adopted for covering his fruit trees.

Mr. Walker evidently is not aware that the method he is extolling was introduced by the Department of Agriculture when engaged in fumigating the orchard on Buderim Mountain, the rough nature of the ground there prohibiting the use of the two-pole method. The one-pole method was tried, with the result that most of the trees on the mountain and also on Blackall Range and at Woombye were covered with the use of one pole only. And it was from the department's officers that Mr. J. Collins got his ideas of the method when the department were fumigating a few of the largest trees in his father's orchard at Redland Bay.

Mr. Walker apparently has not had much experience in covering large trees, judging from the length of pole he uses. His sketch also is misleading, inasmuch as it shows trees 20ft. high with a diameter of only 10ft. From experience I have found orange trees generally to have a diameter almost equal to their height. The diameter of the scarlet mandarin generally exceeds its height, while the Emperor is generally the very opposite to the Scarlet. To cover a tree 20ft. high requires a pole at least 32ft. long. To use a shorter pole only courts danger in breaking or otherwise damaging the tree. And I have never known a tree of the above dimensions treated with less than four men.

I strongly object to guy ropes or tackle being made fast to the trunks of fruit trees, unless they are thoroughly protected by bags or matting to prevent ring-barking, as I have known trees to be completely ruined after being subjected to the pressure of a large sheet.

In conclusion, I may state that for small orchards, or where trees are inaccessible, I advocate the one-pole method. But in large well-laid orchards nothing beats the two-pole method for both cheapness and despatch, for in uncovering one tree you cover the next in one act, which is quite impossible with the one-pole method.

The foregoing letters were submitted to Mr. Alex. Pardy, Government Laboratory, Durban, who has had considerable experience in cyaniding trees. He offers the following observations :—

The one-pole system recommended is one which has been largely practised here; it is extremely suitable and expeditious where the trees are moderately sized, well pruned, and with soft exteriors, as it entails less labour than the double-pole method. For trees from, say, 12 to 20 feet in height it is certainly the best way to work the sheets, either with a bamboo or standard stayed pole, but for trees with old dead branches and thorns sticking out beyond the leaves, such as are frequently found in Natal, the two poles carry the sheet better over the tree, and lessen the chances of tearing the cloth.

Of course a good deal depends on the size and shape of the tree, the weight of the sheet, and other circumstances; for broad trees, and broad and high ones, two poles are preferable for lifting the heavy weight of sail, and carrying it well over the top of the tree. A single pole to do this would have to be a very long and strong one, so that in such cases I am inclined to favour the double poles, as they are less cumbersome, and more easily manipulated. Nevertheless, the one-pole advocated can be used in the great majority of cases, and it is only under rare circumstances that it will not serve the purpose.

Gleanings.

A correspondent writes to the *Daily Express*, stating that he knows of a well-managed and productive farm, within twelve miles of London, entirely tilled and managed by Italians. The farm hands received 8s. a week wages, exclusive of board and lodging. They have a room for recreation, and are forbidden to attend the village alehouse.

The *Breeders' Gazette*, Chicago, gives the following formula for a liquid brand, instead of fire-branding cattle : — "Barium sulphite and coal tar, preparably thinned by equal parts of potash and water and spirits of turpentine each equal in measure to the original composition." The branding iron must not be sharp, as in the case of fire-branding, but about one-fourth of an inch thick.

One of the famous John Mytton's numerous frolics was to start an impromptu race with four of his own cart-horses, ridden by himself and three of his friends, barebacked. Before starting Mytton posted a wagoner at a spot on the "course" where the slope was steep, and gave him orders to cry "Whoa!" as the horses passed him. The man did so, with the result that two of the friends were unshipped by the abruptness of the stop to which their clumsy mounts came on hearing the familiar order.

The first sheep imported into New South Wales arrived in the year 1788, when a flock of twenty-nine Indian sheep were brought from Calcutta. They were not a very promising lot, "small and unsightly, having large heads, Roman noses, drooping ears, narrow chests and shoulders, with high curved backs and very long legs ; having, moreover, coarse and frequently black wool mixed with hair, the latter preponderating." They throve marvellously, and, being judiciously crossed with sheep of a better stamp imported from England, the hair gradually disappeared and gave place to a fleece. The first consignment of wool from Australia arrived in 1806, the shipment weighing 245lbs.

Mr. J. T. Critchell, in the Melbourne *Pastoralists' Review*, gives the approximate number of sheep in the world, as the result of enquiries made to our Board of Agriculture, the Agent-General for South Africa and Canada, the Consul for the United States, and other authorities, as follows :—

Australasia	92,000,000
Europe	165,000,000
Asia	53,000,000
Africa	13,500,000
United States	42,000,000
Canada	4,500,000
Argentina	80,000,000
Other S. American States.	40,000,000
Total	490,000,000

The Victorian average of milk production per cow is only about 3,000lbs., whereas in other countries it averages from 6,000lbs. to 7,500lbs.

The breed of Texas cattle, famed owing to its association with the picturesque figure of the "cow-boy," is fast becoming extinct, and the Texas steer and the cow-boy will soon be known only in history. These sinewy, long-horned cattle are disappearing before the rapid increase of better class stock. The great length of horn was a conspicuous characteristic of the Texan steer. One of the most famous of the long-horned animals in recent times is Geronimo, whose horns measure 9ft. 6in. from tip to tip ; he is said to be thirty-six years old.

Experiments at several experimental stations in America have shown that too deep cultivation is injurious to maize. The first cultivation should be rather deep, but during subsequent workings the ground should be stirred as little as possible. Simply pulverise the crust and kill the weeds. The roots of the corn extend laterally but a few inches beneath the surface, and when the cultivator shovels expose or tear through them, injury is done the plant. The object of cultivation should always be kept in view, to establish and maintain a dust or soil mulch, and to kill the weeds that would rob the corn plants of food and moisture.

A correspondent in the *Live Stock Journal* points out that one of the most remarkable developments of the nineteenth century in the farming line is "the reduction of the age at which the cattle are sent to the butcher. In the early days of the century many farmers never thought of selling their cattle until they reached the age of five years, and we not unfrequently read of them being retained until they were six or seven years old. With sheep it was the same . . . . . "Baby' beef has been and may be sneered at, but it has come to stay. We have not yet reached the limit in this direction either, and the next generation will see the average age of fat cattle still further reduced."

Mr. Howard Saunders, in "Across the Andes and down the Amazons," says he never understood why the vaqueros of Central America, when at work lassoing cattle, always fastened the end of the lasso round their horse's tail instead of to a ring in the saddle, until he saw an accident on a mountain path. A team of mules passed his party ; these mules were tied, the head of one to the tail of that in front, and so on, and as Mr. Howard Saunders passed, one of the mules kicked out viciously, missed its footing, and went over the precipice There it hung, scrambling in the vain endeavour to get a footing, while the mules to which it was fastened stood like rocks on the path above till the men succeeded in passing a lasso round the hanging beast and drawing it up. The tail was cut to the bone, but the mule was otherwise unhurt. The incident shows the remarkable strength of the equine tail.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	F. R. Moor ...	Greystone.
		,,	Cooke & Co. ...	Blue Krantz.
		,,	F. Bloy ...	Monte Christo
		,,	J. G. Maritz ...	Vi Plaats.
		,,	F. Knapp ...	Klipfontein.
		,,	G. M. Rudolph ...	Spitzburg.
		,,	J. W. Moor ...	Moorleigh.
		,,	Nqatabaan ...	Moord Spruit.
		,,	J. Oates ...	Oatsvale.
		,,	P. J. Bester ...	Rensburg Spruit.
		,,	R. C. O'Neil ...	Hillgrove.
		,,	C. J. Labuscagne...	Haatsfontein.
		,,	B. J. Wilkes ...	Portington.
		,,	J. G. Hatting ...	Rama.
		,,	A. G. Harding ...	Marshlands.
		,,	Du Plessis & Cloete	Compensation.
J. Button ..	Estcourt, South of Bushman's River	,,	S. Nel ...	Wagon Drift.
		,,	C. Cope	The Hoek.
		,,	C. B. Lloyd ...	Hidcote.
		,,	Mrs Lindsay ...	Rosebank.
		,,	W. J. Dickens ...	Derby.
		,,	Geo. Gibson ...	Craignevin.
		,,	S. C. Boshoff ...	Waterhoek.
		,,	L. Schomann ...	Twyfelfontein.
		,,	S. Schomann ...	Willow Grange.
		,,	C. Groom ...	Springvale.
		,,	W. McFie ...	Highlands.
		,,	J. K. H. Miller ...	Beacon Hill.
		,,	J. Piccione ...	Greenfields.
		,,	F. Stanley... ...	Nonpariel.
		,,	H. E. Kirby ...	Klipfontein.
A. H. Ball ..	Weenen ...	,,	W. Lotter ...	Doornkloof.
		,,	P Van Rooyen ...	Middleburg.
		,,	C. P. F. Van Rooyen	Mona.
		,,	G. R. Van Rooyen	Victoria.
		,,	P. Lotter ...	Buffelshoek.
		Lungsickness	Mgina... ...	Location
		,,	Maboko	Bushman's River Poort.
J J. Hodson ...	Lion's River ...	Scab	W. Taylor ...	Fordoun.
		,,	W. T. Shaw ...	Shawswood.
		,,	W. Pepworth ...	Bolesworth.
		,,	Mrs F. McKenzie	Onverwacht.
		,,	W. L. Methley ...	Newstead.
		,,	S. Nurden ...	Wood Farm.
		,,	F. Curry ...	Weltevreden.
		,,	Geo. Woodhouse	Halliwell,
		,,	M. A. Sutton ...	Thorney.
		,,	Jas. Ross ...	Gowrie.
		,,	A. Meugens ...	The Mains.
E. J. B. Hosking ...	Upper Umkomanzi	,,	A. G. Mack ...	Misty Home.
R. J. Raw ..	Impendhle ...	,,	T. Fleming ...	Good Hope.
		,,	J. W. Brooke ...	Impendhle Store.
		,,	G. Renyard ...	Hamilton Hall.
		,,	A. C. Crosse ...	Dingley Dell.
		,,	R. Gresham ...	Castle Howard.
		Lungsickness	C. C. Lewis, and Native ...	Clairmont.
W. Wilson ...	Polela	,,	Miller, Bros. ...	Fairacres

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
W. Wilson	Polela	Scab	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
		,,	R. Nicholson ...	Lowlands.
		,,	R. C. Gold ...	Woodend.
		,,	R. M. Arbuckle ...	Costmore.
		,,	J. J. Van Dyke ...	Riverport.
		,,	J. Van der Merwe	Nooitgedacht.
C. E. Hancock ...	Ixopo ...	,,	S. Maritz ...	Maritzdale.
		,,	R. Kennedy ...	Cornhill.
		,,	A. Watson ...	Rosehill.
		,,	W. Gray ...	Helmsley.
		,,	Natives ...	Langefontein.
		,,	J. Dalgarno ...	Abercairney.
		,,	A. Stone	Craigie Lee.
		,,	W. W. Walton ...	Dronk Vlei.
		,,	P. J. Webb ...	Crystal Manor.
		,,	L. Howes ...	Mornington.
		,,	G. Thompson ...	Cromwell.
		,,	J. Anderson ..	Littledale.
		,,	Est. R. Raw ...	Eastwolds.
J. F. Bernard ..	Newcastle	,,	Lulakana ...	Mackenzie's Farm.
		Lungsickness	P. W. Dept. ...	Newcastle T'Lands
		,,	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		,,	A. Paine ...	Mount Prospect
		,,	Simeon Ndhlovu	Freda.
		,,	C. R. Savory ...	Pomeroy and Evin
		,,	Blizzard & Pratt	Ingogo.
		,,	G. Wood ...	Heron's Court.
		,,	A. F. Henderson...	Brazil.
		,,	Lowrens and Van	Buffalo River.
		,,	der Merwe ...	
			H. Fick ...	Northdown.
		,,	H. Austin ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	Natives ...	Elizabeth Dale.
		,,	J. Masangu ...	Pernambuco.
		,,	Funwayo ...	Tiger Kloof.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	G. W. Nourse ...	Glen Harte & De Wetstroom.
		,,	W. Steele ...	Tweefontein.
		,,	— James ...	Newcastle.
		,,	Umketega ...	Vrede.
		,,	A. J. Hurd ...	Tweefontein.
		,,	G. J. Way (Derelict Stock) ...	Vrede.
		,,	Mahakan ...	Kilbarchan.
		,,	Umbetta ...	Freda.
		,,	Maling & Sibibi...	Blauwboshlaagte.
		,,	Umgubana & Mahlogozulu ...	Hope Farm.
		,,	S. W. Reynolds ...	Ramsgate.
		,,	Mangweni ...	Hope.
		,,	Jack Unguni ...	Blauboshlaagti.
		,,	Umpegelele ..	Kilbarcean.
		,,	S. W. Reynolds ...	Minster.
		,,	Umgodini & Kumalo	Greenwich.
		,,	Umbobojan ...	Valsefontein.
		,,	Mrs. H. C. Shorter and Sambana ...	Spectacle Spruit.
		,,	J. T. Grant ...	Rooi Pont.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	C. Jackson ...	Yarl.
		,,	H. C. Dicks ...	Minster.
		,,	T. Ferrier ...	Henley.
		,,	Sekonyana ...	Rooi Poort.
		,,	McMurray & Hurd	Greenwich.
		,,	J. Surtees ..	Newcastle
		,,	Tinta ...	Ballengeiches.
		,,	Verasamy ...	Newcastle.
		,,	Tunziane ...	Blauwboshlaagte.
		,,	W. G. Moss ..	Mossdale.
		,,	J. R. Watt ...	Main's Camp and Bothadale.
		,,	Umkonazi & Pechies	Milton.
		,,	W. L. Oldacre ...	Broadfield.
		,,	C. Kennedy ...	Tennyson.
		,,	Freeman ...	Shakespeare.
		,,	Jim Gama .	Blauwboschlaagti.
		,,	A. James ...	Kabbaslaagti.
		,,	A. Osborn ...	The Mount.
		,,	Wade & Andrews	Macclesfield.
		,,	A. Vanderplank ...	Eagle's Cliff.
		,,	Umshafut ...	Shakespeare.
		,,	J. C. Richards ...	Rooi Pont.
		,,	J. Kumalo and Ndhlebe	Massondale.
		,,	Makehla ...	Tiger Kloof.
		,,	Nehorasing ...	Newcastle.
		,,	Indians ...	Bosch Hoek.
		,,	A. H. Latham ..	Newcastle.
		,,	Inkombe ...	Vlak Laagte.
		,,	Schlunga ...	Blauwboschlaagte.
		,,	Machambu ...	Tiger Kloof.
		,,	Umhlala and Ningazana	,,
		,,	Mgomana ...	Ardrossan.
		,,	Jusveer ...	Lennoxton.
		,,	Petrus ...	The Reserve.
		,,	J. W. Goodwill ...	Cornwall.
		,,	Samiella ...	Duck Ponds.
		Scab	G. Star ...	,,
		,,	C. G. Palmer ...	Dry Cut.
		,,	J. Davidson ...	Lennoxton.
		,,	G. Wood ...	Heron's Court.
		,,	A. D. Uys ...	Horn River and Mooi Krantz.
		,,	T. Ferrier ...	Henley.
		,,	G. Jackson ...	Try Again.
		,,	W. Richards ...	Tweefontein.
		,,	W. E. Few ...	Erin & Imbezana.
		,,	Blizzard ...	Ingogo.
		,,	W. Short ...	Potter's Hill.
		,,	J. Matthews ...	Shakespeare.
		,,	G. Brown ...	Wykom.
		,,	T. L. Möller ...	River Bend.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	R. S. Armitage ...	Boschhoek.
		,,	H. P. Beare ...	Harte River.
		,,	— Wood ...	,,
		,,	Jim Smith ..	Lennoxton.
		,,	S. W. Reynolds ...	Minster &Ramsgate
		,,	N. H. Fick ...	Wykom.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Scab	A. Vanderplank ...	Eagle's Cliff.
		,,	W. Nicholson ...	Rooi Poort.
		,,	M. C. Behr ...	Shuttleworth.
		,,	H. Meek ...	Diepe Hooten.
		,,	J. McDonald ...	Yarl.
		,,	John Vos, jun. ...	Belfast & Manning.
		,,	Mrs. John Vos, sen.	Landsend.
		,,	A. G. Robertson...	Craigholm.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	Anea & Latcham	Plessis Laager.
		,,	W. Oldfield ...	Ambleton.
		Scab	Dickinson Bros....	Braeburn.
		,,	Ulukozana ...	Bishopstowe.
		,,	Bobobo and Umbabana	Zwaartkop Location.
J. Chaplin ...	Klip River ...	Lungsickness	A. H. Spring ...	Reserve.
		,,	A. Armstrong ..	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ...	Grobblar's Kloof.
		,,	Natives ...	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,,	G. Pinkney ...	Kethain Glen.
		,,	J. B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	E. Brayshaw ...	Roodeport
		,,	W. J. Webb ...	Kleinfontein
		,,	H. E. K. Anderson	Gedula.
		,,	E. F. Gibbens ...	Plaat Berg.
		,,	Natives ...	Georgina.
		,,	G. J. McDuling ..	Waterford.
		,,	Natives ...	Langverwacht.
		,,	Nondo Gama ...	F. J. Dewaals' farm
		,,	A. Boers, & Native	Marais Vel.
		,,	W. Neizel, & Natives	Roosboom.
		,,	Natives ...	Doornkraal.
		,,	J. Umpbleby ...	Springfield.
		,,	F. N. Nel ...	Catherine.
		,,	Natives ...	Macpherson'a farm.
		,,	Mdhlondhlo ...	Blaaubank.
		,,	Jobisa ...	Lombard's Kop.
		,,	Nosubala ...	Weltervreden.
			Nondabola ...	Zwaart Kop & Dew Drop.
		,,	Natives ...	Roodepoort.
		,,	Natives ...	Reit Kuil.
		,,	A. S. McHattie ...	Wessel's Nek.
		,,	Scomber ...	Kleinfontein.
		,,	Natives ...	Dreifontein.
		,,	Malela ...	Reit Kuil.
		,,	P. W. Dept. ...	L. Smith Tn. Lds.
		,,	Myanga Tigalala...	Umhlumayo.
		,,	T. Wright	Davel's Hoek
		,,	P. Tondo	Weston
		,,	H. Neville	Quagga's Kirk
		,,	M. Shea ...	Ladysmith Town Lands.
		,,	P. Kumalo ...	Roodeport.
		,,	Pepworth & Reid	Reitfontein.
		,,	W. H. Roberts ...	Arcadia.
		,,	H. Mundey ...	Morden.
		,,	J. O. Potterill ...	Doorn Kloof.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued*).

Stock Inspector.	District	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Lungsickness	Wetherill Bros. ...	Walker's Hoek.
		,,	— Coventry ...	Groote Hoek.
		,,	Cochrane & Illing	Umbulwane.
		,,	— Hazel ...	Roosboom.
		,,	— Field ...	Roodepoort.
		,,	Peddie & Moore ...	Dew Drop.
		,,	A. W. J. Boers ...	Weston.
		,,	M. Shea ...	Bester's Station.
		Scab	J H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson ...	Walker's Hoek.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	G. Wetherill ...	Walker's Hoek
		,,	A. Krogman ...	Brakfontein.
		,,	M. W. Krogman...	Dreifontein.
		,,	P. Marais ...	,,
		,,	H. Boers ...	Dew Drop.
		,,	G. Spearman ...	Feir View.
		,,	J. Van Reenen ...	Wessel's Nek.
		,,	A. Boers ...	Marais Vel.
		,,	A. Carbutt & J. Good	Matiwaan's Hoek.
		,,	Sparks Bros. ...	Ladysmith.
		,,	J. de-Waal ...	Blaubank.
		,,	F. J. de-Waal ...	Lombard's Kop.
		,,	G. Innes ...	Eland's Laagte.
		,,	J. Umpleby ...	Springfield.
		,,	A. J. Taylor ...	Arnot Hill.
		,,	R. Horsley ...	Warrock.
		,,	Dr. Helps ...	Roosboom.
		,,	Corrigel ...	Koolfontein.
		,,	Cockrane & Illing	Dansekraal.
		,,	H. S. Bowers ...	Zaaifontein.
		,,	A. Henderson ...	,,
		,,	A. Henderson ...	Eenvogle Vlei & Elandslaagte.
		,,	G. Ashby	Acol
		,,	W. Wright ...	Colworth.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	H. F. Pearson ...	Everton.
		,,	A. S. Goble ...	Stamford Hill.
W. Freer ...	Upper Tugela ...	,,	Janshey & Indabazimbi ...	Acton Homes.
J. R. Cooper ...	Nqutu & Nkandhla Districts, Zululand	,,	A. Barklie ...	Nqutu Hill, Nqutu District.
		,,	Natives ...	Telezi Hill, ,,
		,,	,,	Nqutu Hill, ,,
		,,	Umasesa ...	Hlati Spruit, Nqutu District
		,,	Natives	Mangeni, ,,
		,,	H. Fry ...	Mpandhleni, Nkandhla District.
		,,	Hutchinson and Hyslop	Near Magistracy, ,,
		,,	H. Swanfield ...	Qudeni, ,,
		,,	Schonyana ...	Babanangu ,,
		Scab	Messrs Havemann	N'Tingwe.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
G. Gielink ...	Eshowe. ...	Lungsickness	Sibobile ...	Matikulu, Eshowe District.
	Entonjaneni, and Umfolosi Districts, Zululand.	,,	Umhlukwana ...	Umsunduzi, ,,
		,,	A. Garland, ...	Bond's Drift, ,,
		,,	G. Higgs & Co. ...	Umhlatuzi, ,,
		,,	P. W. Labuscagne	,, ,,
		,,	F. McGuire ...	,, ,,
		,,	L. Schultz ...	Near Eshowe. ,,
		,,	Luigie ...	Umfuli, Entonjaneni District.
		,,	L. Kritzinger ...	Osborn, ,,
		,,	R. J. Ortlepp ...	Merino, ,,
		,,	J. Fry ...	Empepala, Eshowe ,,
		,,	James Umtembu	Entumeni, ,, ,,
		,,	J. R. White ...	Schuithoek, Entonjaneni District.
		,,	P. Pretorious ...	St. Andrews, M.S., Eshowe District.
		,,	Volker, Schultz, F. Stockholm	Port Durnford ,,
		,,	B. and F. Green ...	Inyoni ,,
		,,	W. Magee ...	Umlalazi ,,
		,,	J. Henwood ...	Inyoni ,,
		,,	G. Müller ...	Duikerhoek, Entonjaneni District.
		,,	F. Buys ...	Barneveld ,,
		,,	Damusa ...	Kemp's Farm, Melmoth ,,
		,,	F. A. Ortlepp ...	Saxony ,,
		,,	T. Smith ...	Oakdale ,,
		,,	J. A. Ortlepp ...	Vlakbult ,,
		,,	J. R. White ...	Elizabeth ,,
		,,	T. Cooper ...	,, ,,
		,,	Jas. Howe ...	Lower Tugela, Eshowe District.
		,,	E. W. Lamb ...	Amatikulu ,,
		,,	C. Adams ...	Umlalazi ,,
		,,	F. Dickens ...	,, ,,
		,,	Carlie ...	Imfuli M.S., Entonjaneni District.
		,,	C. J. Van Rooyen	Wansbeck, Entonjaneni District.
		,,	H. A. Liversage ...	Morgeson, Entonjaneni District.
		,,	Umlomo-Umdinwa	Ematikulu, Eshowe District.
		,,	L. Botha ...	,, ,,
		,,	H. Liversage ...	Umlalazi, ,,
		,,	P. Nel ...	Noitegedacht, Entonjaneni District.
		,	Josiyasi	Umlalazi, Eshowe Division
		,,	J. Vermaak and Muller	Umhlatusi Valley
		,,	Springer	Empangeni, Lower Umfolosi District.
		Scab	R. J. Ortlepp ...	Merino, Entonjaneni Disttrict.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
W. W. Dore ...	Portion of Zululand North of White Umfolozi and	Lungsickness	Dinizulu ...	Hlabisa District.
		"	Surrendered Boers	"
		"	C. Wheelwright ...	Nkonjeni, Mahlabatini District.
	Umfolozi Rivers	"	— Van Rooyen ...	" "
		"	E. Loffler ...	Bulwana, "
		"	Magojala ...	" "
		"	Mapangisa-Zambula	Ingwavuma District.
		"	Nsicongo-Umkoombuzi	Hlabisa District.
		"	Nomacamcam-Dada	"
		"	Noham-Ukusa ...	"
		"	Mahakan-Mangaba	"
		"	Mangumsan-Matanta	"
		"	Umhoomo-Umcatusa	"
		"	Umlogotwa-Buzani	"
		"	Gufa-Nsihow ...	"
		"	Ungangaza ...	Pression.
A. Klingenberg ...	Umsinga ...	"	E. V. L. DuBois ...	Vergelugen.
		"	H. Müller ...	Vermaak.
A. J. Marshall ...	Dundee ...	"	Natives ...	Renier.
		"	Natives ...	Navigation Colliery
		"	N. Glutz ...	Swiss Valley.
		"	C. F. Van Rooyen	Davelsberg.
		"	H. J. Harris ...	Sterkstroom.
		"	D. Neumann ..	Waterfall.
		"	Natives ...	Weltervreda.
		"	S. N. Robins ...	Dundee.
		"	N. Glutz ...	Morgenstont.
		"	Natives ...	Maybole
		"	Umonto ...	Crown Lands, near Dundee.
		"	J. F. Johnson ...	Dewaar's Nek.
		"	Murray & Co. ...	Navigation Collieries
		"	J. Kemp & Natives	Kelvin
		"	J. H. Reis ...	Longfontein.
		"	J. Landman ...	Boschfontein.
		"	D. C. Pieters ...	Goedekeus.
		"	A. J. Hurd ...	Waschbank.
		"	J. A. Naude' ...	Dewarsberg.
		"	Umsombuloko ...	Hatting Dale.
		"	Umnyesa ...	Klipwe.
		"	Turton Bros. ...	Hayfield
		"	H. Sehroeder ..	Rosenen
		"	G. H. Stokes ...	Ruigetfontein
		"	P. Z. Gouws ...	Kelvin
		"	E. G. Wohlitz ...	Stille Rust
		"	— Newby & Native	Carolina
		"	W. Stein	Flint
		Scab	A. Jansen ...	Sheepridge.
		"	J. H. Erkland ...	Carolina.
		"	F. J. deWaal ..	"
		"	J. H. Reis	Longfontein.
		"	J. W. Dupreez ...	Jackalsfontein.
		"	H. J. Hearn ...	Hatting Spruit.
		"	N. Glutz ...	Swiss Valley.
		"	C. F. Van Rooyen	Davelsberg.
		"	Maritz & Thornhill	Aletta.
		"	W. V. Marshall ...	East Lynne.

RETURN OF FARMS AT PRESENT UNDER LICENSE FOR DISEASE IN STOCK—(*continued.*)

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ..	Dundee ...	Scab	P. J. Gouws ...	Uitflucht.
		,,	H. Harris ...	Sterkstroom.
		,,	Murray & Co. ...	Navigation Collieries
		,,	J. J. Uys ...	Verdenk.
		,,	P. H. Swart ...	Hartebeestefontein.
		,,	H. J. Nel ...	Blinkwater & Evansdale.
		,,	A. G. Vincent ...	Craigieburn.
		,,	D. Meumann ...	Waterfall.
		,,	Turnbull & Co. ...	Washbank.
		,,	Peerbhoy ...	Dundee.
		,,	H. J. Hearn ...	Double Kraal.
		,,	Thos. Dewaar ...	Navigation.
		,,	A. B. Daniel ...	Beith.
		,,	H. Kriel ..	..
		,,	F. Kolbe ...	Langfontein & Staat.
		,,	G. Colbe ...	Zwaartwater & Rest
		,,	R. J. Marshall ...	Cleveland.
		,,	G. F. Ferreira ...	Hyle.
		,,	J. Kemp ...	Kelvin.
		,,	J. Campbell	Manor Park.
		,,	Marshall Bros. ..	Cleveland.
		,,	J. Meyer ...	Mauchline.
		,,	A. J. Potgieter ...	Dewarsberg.
		,,	Kriel & Daniel ...	Beith
		,,	J. Landman ...	Boschfontein
		,,	H. Davel	Klipsruy
		,,	N. F. Hesom ...	Helena
		,,	E. G. Wohlitz ...	Stille Rust
		,,	J. J. Gregory .	Cotswold
		,,	E. J. Stepney ...	Uitray
W. A. Hutchinson	Alfred ..	,,	L. Hedder ...	Roadside
		,,	W. Stafford ...	Sutherland.
		,,	Nqubu ...	Location.
		,,	Makubana ...	Amaci Location.
		,,	J. S. Payn ...	Furney Hill.
		,,	J. Wessels ...	Sheepwalk.
		,,	G. Whitelaw ...	Deemount.
		,,	Geletu Flentyi ...	Location.
		,,	Inkubi and Duli ...	Location.
W. Gray ...	Upper Tugela, S. of Tugela River	Lungsickness	P. Van der Reit	The Bend.
		,,	F. E. Zunckel ...	,,
	& Estcourt, N. of Bushman's River	Scab	A. J. Harding ...	Zwart Kop.
		,,	J. Dryer ...	Culfergie.
		,,	C. C. J. Bester ...	Brand Kraal.
		,,	J. M. Wales ...	Farleigh.
		,,	D. Evans	Zuur Laager
G. N. Perfect ...	Umvoti—Eastern Portion	,,	L. J. Nel ...	Glenboig.
			J. M. Botha	
F. E. Van Rooyen...	Kranzkop ...	,,	L. J. Potgieter ...	Broedershoek.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	— Thompson ...	Marburg.
		,,	W. Clothier ...	Ultima Thule.

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand have been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office,
9th October, 1901.

M. J. HIME,
for P. V. Surgeon.

The Lion's River Agricultural Society.

PRESIDENT'S ANNUAL REPORT.

THE following is the Annual Report of the President of the above Society, Mr. M. A. Sutton :—

The past year has been notable as one of the driest seasons experienced in this District; 1878 was a more trying year, but the streams this last season were, I think, lower than in 1878, and many remained dry for a longer period; the country requires a good deal of rain to place the springs on a stronger footing, and to counteract the dry seasons of the last few years. We hardly remember what a flood looks like, and although I fear farmers would now find it interfered greatly with their ploughing and weeding work, I think all will agree with me that a wet season is needed.

The result of the dry weather in this district is mainly to be seen in the failure of many of the potato crops, and a very much lower return per acre on the mealie crops than was at one time hoped for.

The war still goes on, but there are signs that the end is steadily drawing nearer, and while we, in this District, have cause to be thankful that we are living in a state of peace, we hope to see the whole of South Africa once more peaceful and prosperous. I hardly expect to see this come about all at once, it is more likely to be gradual, and little by little, and if this is the case, it will probably enable business relations to be resumed with the least difficulty, and the various problems of transport, food, &c., be met with more ease than if there was a sudden end of hostilities.

South Africa has now a white population vastly greater than it had two years ago, and it seems to me is likely to hold that population. Naturally it becomes the duty of farmers to endeavour to supply, as far as possible, the wants of this increased number of inhabitants. This will take a long time, but when the country gets more settled, and the lands in the Transvaal Colony and the Orange River Colony can be worked to advantage, we shall, I think, see production creep up to consumers' demands, and importation cease in a like proportion. The pressure on the country is now shown in the demand for small or medium-sized farms near the railway, and the high price of land in such positions. I cannot help thinking those prices will not hold, or rather that it will not be easy to get those high prices in a few years time. I do not think we shall have a serious slump in farm produce, but we shall have to face competition in a more enlightened form than heretofore, and it will have to be met by care, enterprise, and forethought.

This District has not shown itself backward in enterprise, and farmers here may congratulate themselves on having had some few years of prosperity, in which they have been able to accumulate a little capital, which is absolutely necessary if much is to be done quickly and to the best advantage.

The work of the Society has been going on steadily, and our last show, in spite of the bad weather in the afternoon, was very well attended. The exhibits of horses were the principal feature, and many classes drew large entries. This was mainly owing to the liberality of those who gave us special prizes, the bulk of the specials going to the horse classes. An effort has been made during the past year to get the Showyard into shape, and I had hoped by this time to have seen permanent cattle kraals erected, and the yard completed; the Government, however, have decided to build a new bridge over the Umgeni, and the Society is awaiting a reply as to the position of the new bridge, so as to get the road and approaches arranged, and be in a position to put fences, kraals, &c., where they shall not require to be removed.

The Hall has proved itself a wise investment, and has proved none too large for the requirements of the District. So soon as the Government can give us a definite answer regarding the new bridge, it will be wise to get the Showyard completed, and at the same time it will be well to provide a stove in the Hall kitchen, and have some plain shelving and tables erected in the kitchen and pantry.

I have thought that, provided the ground could be spared, an effort should

be made to have tennis courts laid down in front of the Hall. The verandah and kitchen, etc., would come in very useful, and an arrangement could be come to with the Lawn Tennis Club as to tennis, that would be of advantage to both Society and Club. This is a matter for the incoming committee to deal with, and I merely make the suggestion.

It will be necessary to appoint a committee to arrange about the completion of the yard, when the time arrives, the present committee having done all they can at present.

The thanks of the Society are due to your committee and officers. Our hon. secretary has proved himself a success, and I think we should endeavour to keep him for another year at least. I think it is advisable that you appoint a new President this year. I have now been in the chair for two years, and having had a good deal to do with the building of the Hall, etc., I feel that another man coming fresh to the work will do more for the Society than I can. In conclusion, I wish to thank all committeemen and office-bearers for the way in which they have carried out the work of the Society, and I feel that we have only to pull together to make the Society one of the best country societies and shows in the Colony.

Ixopo Farmers' Association.

ANNUAL MEETING.

The above meeting was held in the hall on the 28th ulto., there being present: Messrs. C. E. Hancock (President), Thomas Foster, J. Schofield, G. Martin, W. K. Anderson, John Anderson, W. H. Walton, A. S. Arden, G. E. Francis, and others.

THE PRESIDENT'S ADDRESS.

The President, in his address, expressed regret that so many of their members had been again called out on active service, and the opinion that the time had arrived when a burgher law should be enforced, so that active service would fall equally on all. Certain correspondence had passed between the C.I.D. and the association relative to the detection of stock thieves. The association had been requested to nominate a suitable man as detective officer, but as so many of the volunteers were interested in the subject, he suggested a postponement of the nomination pending their return.

RINDERPEST.

We are again—after an interval of four years—threatened with a visitation of rinderpest. Should the disease again break out in the colony, it is to be hoped that stringent measures will be adopted to prevent the indiscriminate inoculation and infection of cattle which occurred in too many instances before. All reports go to show that, so far, the disease is of a less virulent type than was the case four years ago.

IRRIGATION.

I am glad to notice that the advantages of irrigation are becoming more generally recognised in this Division. No doubt the dry seasons we have had for the past year or two—together with the rust in summer-grown oats—have led farmers to give more attention to this subject, and, in so far, have perhaps been blessings in disguise. I would like to point out, however, that, as far as my observation and experience goes—irrigation has not the same virtue in Natal as in the Cape Colony, and, as I am given to understand, in many parts of the Orange River Colony; the chief reason being the porous and friable nature of our soil. The water, instead of being applied to the surface of the ground only, percolates straight downward, carrying a good deal of the rich constituents of the soil with it, so that unless care is taken the ground is very rapidly impoverished. Another reason, perhaps, is that the water itself in Natal is purer; whereas, in Cape Colony, as a rule, the water holds so many chemicals in solution that its effect when applied to the land is as that of liquid manure. It is, however, a distinct benefit, even in Natal, to irrigate lands which are fairly level, and I should strongly advise every farmer to go in for it if practicable.

GENERAL.

It is very gratifying to be able to announce that the list of members of this association shows a considerable increase over last year. The association being the recognised medium for carrying the wishes and needs of the Division to the Government, it is to be hoped that the membership roll will be still further augmented during the coming year. From the Treasurer's report it will be seen that the finances of the association are in a satisfactory state. Your thanks are due to the Hon. Secretary and Treasurer, Mr. Francis, for his services during the past year. The work is very considerable, and tends to increase, and the efficient manner in which it is discharged lays us under a deep obligation to that gentleman.

Ixopo Agricultural Society.

The annual general meeting of the Ixopo Agricultural Society was held at Stuartstown on September 28th. Mr. Thos. Foster (president) occupied the chair, and there were also present Messrs. C. E. Hancock, Arden, Francis, W. K. Anderson, W. H. Walton, Thompson, P. McKenzie, Abrahams, Chadwick, J. Gold, Beningfield, Schofield, J. Anderson, J. Robinson, Knight, Henderson, T. W. Greer, Elliott, and C. Camp.

The President said : — Gentlemen,—I have much pleasure in submitting for your approval the fourteenth annual report and balance sheet of the Ixopo Agricultural Society. The annual show was held on the 3rd July, and, in spite of many difficulties, may be considered a success. The entries were not so numerous as in former years. Owing to the dry season, there was a marked falling-off in produce entries. In this section many of the exhibits, although small in quantity, were of excellent quality. I regret to say that

FORAGE.

Forage is most necessary—in fact, in my opinion, it is absolutely indispensable—and, so far, no satisfactory substitute has been found, although many experiments have been made. Should the "Mapstone rust-proof oat" turn out a success, Messrs. Mapstone Bros. will deserve the thanks of the farming community for the discovery.

MEALIES.

There appears to be a great diversity of opinion with respect to the last season's mealie crop. I do not consider that it has reached the average of the last three years, although the usual acreage was planted. The light rainfall must be held responsible for the deficiency in the yield.

STOCK.

The show of horses was good, both in number and quality. Many of the animals had the appearance of being well cared for and attended to. No doubt the brisk demand for horses has caused breeders to pay more attention to the condition of their breeding stock. The show of cattle was confined to a few breeders, and, although there were some very excellent animals, I do not think the number of exhibits compares favourably with that of former years, Shorthorns and Devons being the principal competing breeds. Each of these had their admirers. The challenge cup was taken by Mr. W. K. Anderson, with specimens of the former breed. In the sheep exhibit, the high reputation of this district was fully maintained, but I should have been glad to see a larger number of competitors in addition to the old-established breeders. It is gratifying to inform you that the judges expressed their satisfaction at the very creditable lot of sheep which was placed before them.

POULTRY.

The new pens are a great acquisition, and enabled everybody to see the birds to the best advantage, in addition to proving a comfort to the birds and a convenience to the exhibitors. I should like to see this industry extended, as I feel sure it is one that cannot fail to prove highly remunerative.

RINDERPEST.

The reappearance of this plague in East Griqualand is a matter for serious consideration, and it is gratifying to note that the Government has adopted the most stringent precautionary measures to prevent its being brought into this colony. I am pleased to say that our local Veterinary Surgeon reports that the outbreak is not as serious as was feared. I must repeat the remarks I made on a previous occasion as to the necessity of keeping abreast with the times, and preparing to face competition with other countries, by the adoption of the most modern and improved system of farming, and by taking advantage of the numerous labour-saving appliances and chemical manures which are now coming into general use.

A Milking Device.

THE cheap and simple aid to cleanly milking shown in our sketch (from the *American Agriculturist*) is made in the following manner :—Get a wooden hoop a little smaller than the top of the

milk pail. Put a square cheese cloth over the top of the pail, and hold it in place by the hoop as shown. The arrangement can be made in a few minutes, and costs practically nothing. The cloth should be washed after each milking, when it will be ready for use again.

Bees in South Africa.

(*To the Editor Agricultural Journal.*)

SIR,—I am sending you enclosed a number of the "British Bee Journal," in which you will find an article on bee-keeping in South Africa, by Mr. Martin, of Port Elizabeth, which you may think worth taking over for the *Journal*.

It is interesting to know the opinion of anyone of Mr. Martin's experience, as he holds the certificate of the British Bee-keepers' Association as an expert, and my own experience quite coincides with his, although, of course, the climate up-country may make a difference.

There are a good many people in the Colony keeping bees, and it will be useful for them to know that the rules laid down in the books published in Europe should not be too strictly adhered to, but the hive itself should be studied.—Yours, &c.,

A. C. SEWELL.

The following is the article referred to by Mr. A. C. Sewell :—

Although it is some time since I wrote to the "B.B.J.," I often think of the bees and friends left behind in the dear old country, and although only four years have passed since I came out here, some of the friends have already passed away, and correspondents unknown to me have appeared as contributors to our journal. We have the war curse still with us, and although not very close to the seat of hostilities, we see evidences in the shape of maimed and wounded soldiers from the front. It makes those who are near these sights pray for the time when some other way of settling disputes may be found than the arbitrament of the sword. In my last note to the "B.B.J.," I explained how different were the conditions of bee-keeping in South Africa, so that it was like starting afresh. One of your readers out here, dwelling some distance up-country, took exception to my statement, and wrote me to that effect, and wished to correspond with me on the subject, but I have no time for private discussion, and so will answer him in the "Bee Journal." At the same time, it may possess interest for readers at Home.

To begin, then, the bees are quite different. Of the kinds I have come across, one is a very small dark bee, another somewhat larger; some have three bright bands round the abdomen, and these latter are easily subdued. I seldom require a veil when at work with them; the only time they are at all spiteful is in the middle of very hot days; they are great crawlers, especially by night, and are more apt to get up your sleeves than the English bee. If you first hive them in a straw skep, as at home, and then shake them down in front of the frame-hive to let them run in, they will often take wing and fly right off. All the honey I have tasted here is of peculiar flavour, quite different from British honey. The bee-flora also—with the exception of fruit trees—is not the same. A lot of the honey plants out here are such as I never saw before, and there is no book or record of their names here to be had. Then the seasons are not a bit like they are at Home. It is now (July 6) mid-winter, yet I have the bees working in shallow frames and sections, and am expecting to get more off the hives this winter than I have had since I arrived here. Fancy having a natural swarm at Christmas in the middle of winter; and yet I have this afternoon hived a splendid swarm. Several others of our hives have also swarmed this week. I have found out that after we have had rain, no matter what time of the year, you will get honey. In this way, then, the showers are the salvation of our honey crop. We have some difficulty in getting the swarms to stay in frame-hives, and require excluder-zinc to confine the queen to the hive until the bees settle down.

Most of our houses here are made of galvanised iron, lined with board; indeed, this is a noted place for these iron buildings, and the houses generally contain two or three swarms between the wood and iron. The bees seem to have a contempt for our new hives, never having been used to them, I suppose. The queens are very prolific. I have stocks with twelve or fourteen frames crammed

with brood. I hope to send you some empty comb, in which I think you will find smaller cells than in English combs. I should say the cells here would run five or six to the inch, but have never measured them myself. In all the strong hives drones are found all the year round. The bees here are splendid workers, labouring from daylight till dark when fine. They stop working, however, in the middle of the day when very hot. Then, as already said, we have the bee-enemies to contend with. Finally, and after all my experience since I wrote last, it has only confirmed the opinion I then expressed—*i.e.*, that bee-keeping here is very unlike what it is at Home. The bees need two things, viz., plenty of air when it is hot (which is very often), and plenty of room, and no warm wraps to keep the cold out.

Serum Treatment of Rinderpest.

GOVERNMENT ENQUIRY AND RESULT.

The committee appointed on 24th June to consider and report on the claim of Mr. H. Watkins-Pitchford, F.R.C.V.S., Principal Veterinary Surgeon, to have been the discoverer—either individually or in conjunction with Mr. Theiler—of the serum treatment of rinderpest, has made an interesting report to the Government. The committee consisted of Mr. J. Hyslop, D.S.O., C.M.G., M.B., Mr. A. W. Cooper, J.P., F.R.M.S., and Mr. G. Leuchars, M.L.A.

The report stated that Mr. Watkins-Pitchford arrived in Natal at the end of May, 1896, and that in September of the same year he left for the Transvaal for the purpose of investigating rinderpest, in conjunction with Mr. Thieler, the Transvaal Veterinary Surgeon. Before leaving, he indicated to Mr. G. M. Sutton, the Ministerial head of his department, that he intended to follow the serum method of treatment in his investigations, with a view to its application to rinderpest. On the 12th December, 1896, writing to his wife, Mr. Pitchford said: "I am reporting by this post to the Government that our investigations are very promising, and that we have produced a curative serum which will confer immunity." He also reported to the Commissioner of Agriculture, on the 19th December, seven days later, that they (Messrs. Pitchford and Theiler) "had been able to discover a process by which undoubted immunity could be conferred." This report, with other documents relating to Messrs. Pitchford and Theiler's researches on rinderpest, were destroyed in the Maritzburg Town Hall. The first public official announcement in Natal of the results of these investigations appeared in the "Gazette" on April 6th, 1897, being dated February 15th of the same year.

The committee then point out that Professor Koch reached Kimberley on December 5th, 1896, and that the first report in which he referred to serum in connection with his investigations into rinderpest was dated January 31st. On February 10th he stated that "by means of a mixture of serum and virulent blood" he was able to produce "an active immunity equal to that of a beast which had contracted rinderpest and recovered."

The committee, after hearing the evidence of the Hon. G. M. Sutton and Mr. C. B. Lloyd, late Commissioner of Agriculture, and considering various reports, found as follows:—

That Messrs. Watkins-Pitchford and Theiler are justified in claiming priority in the successful application of the serum method of treatment to rinderpest.

That at the same time there is no evidence before the committee, nor does the committee know of any evidence to show that Mr. Watkins-Pitchford published the result of his researches prior to Professor Koch.

The committee further find that Mr. Pitchford's claim to have been—in conjunction with Mr. Theiler—the originator of the application to rinderpest of the serum method of treatment is a just and reasonable one, and that it is, in the opinion of the committee, of such an important nature as to merit recognition.

The committee recommend that this report be laid before Parliament, and that copies be forwarded to the Royal College of Veterinary Surgeons, London.

The committee desire to record that, in their opinion, the greatest credit is due to Mr. H. Watkins-Pitchford for his careful and assiduous research, ably conducted, often under adverse circumstances, into the question of rinderpest.

The late Miss Ormerod's will shows a personal estate of over £50,000. The deceased lady has been good to her friends, and has particularly remembered, with more than gratitude, the Edinburgh University, where the degree of LL.D. was bestowed upon her.

Garden Notes for October.

By W. J. Bell, Florist and Seedsman.

SOW for succession dwarf beans, beet, cabbage, carrot, lettuce, mustard and cress, onion, radish, tomato, vegetable and custard marrow. Capsicum and egg-plants may still be sown except in the colder districts. Plant out cucumbers, marrows, tomatoes, luffa and egg gourds. Cucumbers should be planted only in sheltered situations: the south side of a wall or fence, where they will be well protected from hot dry winds and mid-day sun. Marrows will bear a more sunny aspect, though shelter from hot winds is preferable.

Tomatoes prefer a sunny aspect, but should be staked and trained so that the fruit will be protected to a certain extent by the foliage to prevent the sun blistering. Plant out in rows three feet apart and two feet between the plants in rich soil. When the fruit begins to set give occasional applications of liquid manure and plenty of water in dry weather.

The luffa and egg gourds should be trained over a trellis so as to allow the fruit to hang quite free and without touching the ground, as a bruise or continual chafing will cause decay. The luffa or sponge gourd is ripe when the outside skin is quite brown and brittle, and will easily part from the fibrous mass inside, which is in great demand as a substitute for a sponge or dish rag. The egg gourd, so called on account of its similarity to a hen egg both in colour and shape, makes a fine substitute for a nest egg.

Plants of the susu or Indian marrow should now be planted out where they will have plenty of room, as they make enormous growth in a season, and will produce great quantities of fruits similar in taste when boiled to a marrow. One of these plants if allowed to run into an old tree will keep a family supplied all through the season till frost sets in. If tree tomatoes are required these should be planted out now for bearing next season. A situation sheltered from high winds is the most suitable as the stems are rather brittle.

The main crop of celery should be sown this month for planting out in February. The sowing and raising of the young plants require great care and attention. The best position for the celery bed is on the south side of a building or high wall, or a belt of trees if not to near, as shade during the greater part of the day is absolutely necessary. The soil should be well worked with a layer of old decayed manure or leaf mould forked in near the surface; this will prevent cracking and backing of the soil, which is so fatal to the young seedlings. Sow the seed on the surface and slightly rake it in, then cover evenly with straw or litter of some kind and give a good watering. The bed after this must never be allowed to get dry, especially after germination has commenced.

If a suitable place cannot be found for a celery bed sow in shallow boxes in some sheltered spot, taking care not to have them directly under trees where the drip would be fatal. When the seedling plants begin to show through, a little of the litter may be removed on dull or wet days only, and it will not be safe to remove it entirely until the plants are strong. The seed takes several weeks to germinate.

Flower Garden.

During wet weather all kinds of evergreen flowering shrubs may be planted, such as abelias, abutilons, azaleas, brunfelsias, camellias, duranta, eurya japonica, Eranthemum, euonymus, galphimia, gardenia, hibiscus sinensis, holmskoldia, hydrangea, hypericum, justicea, lasiandra, laurestinus, mussaenda, myrtle, oleander, photinia, plumbago, streptosolen, swainsonia, Turrœa, weigelia, &c. All kinds of evergreen creepers should also be planted now, such as aristolochia or Dutchman's pipe, Bignonia speciosa, and tweediana, clerodendron, cobœa scandens, ficus repens or creeping fig, grenadilla, woodbine, red honeysuckle, Japanese Honeysuckle, maurandya, petrea, scarlet, purple, and blue passion-flower, rhyncospermum, solanum jasminoides or potato creeper, solanum wendlandi, tecoma australis, and jasminoides. All varieties of citrus trees may now be planted, taking advantage of wet weather, such as oranges, naartjes,

mandarins, lemons, limes, and pomelos, also guavas and loquats.

The planting of new fences may also be commenced now. For a permanent evergreen garden fence there is nothing to equal the thuja orientalis. The Japan privet also makes a good fence and grows quickly; also the eugenia eucalyptoides. This latter makes a fine breakwind if allowed to grow to its full size.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—Trade practically remains the same as it was a fortnight back, with little or no change in prices. Rain has again fallen in considerable quantities throughout the Colony, but, owing to the recent calling out of the volunteers, farming operations will be delayed. In addition to this, many farmers are hampered by the commandering of their oxen and wagons, and whilst this fact is inducing some to rush their grain into market, it is having the reverse effect with others. Owing to grain having somewhat firmed a little, speculators for the Johannesburg market have been choked off for the time being, Johannesburg men declining to purchase at present quotations.

Mealies.—On the market mealies have been up to 12s., 12s. 4d., and 12s. 8d. per muid, including sack, but large quantities have been purchased at prices varying between 12s. 3d. and 12s. 6d. per muid, including sack

Forage.—Some very fair samples are being offered at prices varying between 8s. 6d. and 9s. 9d. per 100lbs.

Hay.—Good hay commands high prices, the average being about 4s. to 4s. 6d. per 100lbs. Bedding, from 3s 6d. to 23s. 6d. per load.

Potatoes.—Good eating potatoes are far from plentiful, and have realised from 19s. 3d. to 24s. 3d. per 100lbs.; inferior samples have fluctuated between 6s. 9d. and 12s. per 100lbs. Sweet potatoes, from 2s. to 6s. 3d. per sack.

Mabele.—While some samples have been as low as 5s. and 6s. per 100lbs., others have exchanged hands at 10s., 10s. 3d. and 10s. 4d. per 100lbs.

Beans.—Common red 5s. 3d. per 100lbs., but good samples have commanded from 13s. 6d. to 17s. per 100lbs.

Tobacco.—Prices have averaged about 8d. per lb.

Pumpkins.—From 4s. to 8s. 9d. per dozen.

Onions.—From 12s. 6d. to 29s. 2d. per 100lbs.

Eggs.—Prices have considerably fluctuated, some samples being as low as 8d. per dozen; others 1s. 3d., 1s. 9d., and 2s. 1d. per dozen.

Poultry.—Common fowls, from 2s. 2d. to 5s. each; turkeys (cocks) 8s. 3d. to 14s. 6d. each (hens) 5s. 6d. each; ducks, from 3s. 6d. to 8s. 3d. per pair; geese, 7s. 3d. each.

Butter.—From 9d. to 2s. per lb.

Vegetables.—Beans, beetroot, cabbages, carrots, celery, lettuce, onions, peas, potatoes, and tomatoes sold every day.

Fruit.—Bananas, lemons, oranges, naartjes, papaws, and pineapples, constitute the varieties sold every day.

Sundries.—Mutton, from 6d. to 10d. per lb.; pork, from 3d. to 7d. per lb.; beef, from 3d. to 6½d. per lb.; ham. from 10½d. to 1s. 3d. per lb. Several mornings fish has been disposed of at prices according to size, the average price being about 6d. per lb.

Wood.—From 5d. to 11d. per 100lbs., cut firewood 1s. 3½d per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Business remains good, and prospects all round are of a most encouraging nature.

Mealies.—There is a lull in the market, and very little movement is observable, though on the whole the tendency is easier. The apparently hopeless impossibility of obtaining freight is chiefly responsible for this state of things, and it must be borne in mind that within three months from date the weevil will have a large say in any diagnosis of the market. Only a small proportion of the immense crop reaped has been used up, and it is quite possible that a slump will occur as the season advances. Any relief in the direction of freight facilities, would, however, firm the market. Present prices are about 12s. per bag.

Forage.—The fodder market is still wholly supplied by the imported product, but up-country farmers report well of the crop now coming to hand, which, however, is small, owing to the limited acreage planted. The writer recently had the pleasure of inspecting a beautiful patch of Algerian forage at Inchanga, which had already been cut three or four times this winter, and is now tall, thick, and all coming into ear, without a spot of smut or rust. Had farmers taken the advice of the writer through this Journal early in the season to plant each a few bags of Algerians as a trial, the Colony would have been far richer by many hundreds of tons of good forage.

Potatoes.—The imported article still rules the market, and will do so for a couple of months. The season is grand, and good crops may be expected this spring.

Hay.—This line is scarce, and in strong demand. Farmers should take advantage of the market to get rid of all old season's stock.

Recent advertisement in a New South Wales newspaper:—"Wanted a smart boundary rider, who thoroughly understands sheep and their working. Also must be willing to make himself generally useful. Find own horses. Wages, 15s."

The Agricultural Journal

AND MINING RECORD.

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CONTENTS.

The Colorado Beetle.

By CLAUDE FULLER, Government Entomologist.

IT is now many years since there was a general scare throughout all potato growing countries, more particularly in Great Britian and Europe, on account of the Colorado Beetle. This insect, as its name implies, belongs to the western region of the United States of America, and was discovered there the best part of a century ago. Until 1861 it remained obscure in the remoteness of the Rocky Mountains, when, aided by the extending cultivation of the potato, it commenced a destructive progress eastwards, ultimately spreading over the whole of the potato growing area of the Union and into Canada.

The damage it did at the time gave rise to the greatest fears upon the part of potato growers in various parts of the world, and these fears seem likely to be revived by the recent discovery of the pest at Tilbury Docks, London, feeding

in some potato patches grown by employees of the London and Indian Dock Company.

As such fears will in all probability reach Natal, it will perhaps be well to point out first that the outbreak in England appears, from published accounts, to have been dealt with in a drastic measure, and, secondly, that the possibilities of the pest being introduced to this Colony are fairly remote. In support of this contention one has but to instance the fact that, despite its prevalence in North America, it has never become established in any other part of the world, and, further, the great distance it would have to travel by sea, passing at the same time through all the vicissitudes of radical changes of temperature and failure of food supplies whilst in transit, reduce the chances of accidental introduction to a minimum.

The Colorado Beetle is from one-third to half and inch long, of a yellow colour, with ten longitudinal black lines down the wing cases, and with reddish yellow and black legs. The lava, when mature, is very thick in the middle, and of an orange or reddish brown hue, with black spots on the lower portions. Long, oval, yellow eggs in clusters are laid by the female beetle on the under surface of the leaves of the potato, and these may appear also in certain weeds in the vicinity. Both larvæ and beetles feed voraciously on the potato haulm, but they are also known to feed on other plants, such as tomatoes and poppies, while, failing more congenial food, they may possibly be found on rough grasses and other weeds.

The thought that the insect might reach the Colony in any but an accidental manner cannot be entertained, and whilst it is possible, with fancy flights of the imagination, to conceive several means by which the pest might be inadvertently introduced in one or the other stages of its life history, these are chances which must be taken and such as are uncontrolable. As on occasion, however, the unexpected sometimes happens, there is no reason why farmers should not be put upon their guard in the matter, and recommended to send any beetle or grub found feeding on the foliage of the potato or other solonaceous plants, such as the egg-plant or tomato, to the Agricultural Department for determination.

Mapstone Oats.

NOTICE.

THE Minister of Agriculture is desirous of obtaining reports from all persons and agricultural societies supplied with Mapstone oat seed last season upon the success, or otherwise, of the oat. Reports dealing with the seed in its earlier stages of growth which have been supplied to the Government Etomologist have already appeared in these pages ; they represent, however, but a small quantity of the seed supplied. A considerable quantity has been distributed both direct from the Department and through societies, and with respect to which there is no information. It is desirable that the Department should be in possession of the fullest information regarding the general and local suitability of the seed, as a guide to its action in the further distribution of the seed which is now, according to the conditions of the original distribution, being returned.

Particular information is requested with regard to :—

1. Time of sowing.
2. Previous crop in soil.
3. Cultivation and manuring.
4. Irrigation.
5. Whether fed off by sheep or cut.
6. What symptoms of rust were noticed.
7. When crop was reaped.
8. Weight of seed per acre.
9. Weight of straw per acre.
10. Any general remarks.
11. Value of crop, less working expenses.

The following statement shows how the 27 bags of oats purchased by the Department from Messrs. Mapstone Bros.

were distributed. The individual farmers mentioned were supplied in response to special applications.

To Whom Supplied.	Quantity in lbs.
Mooi River Farmers' Association ...	200
Lion's River Agricultural Society ...	100
Weenen Agricultural Society ...	200
Gourton Farmers' Association ...	100
Richmond Agricultural Society ...	100
Nottingham Road Farmers' Association	200
Umvoti Agricultural Society ...	100
Ixopo Agricultural Society	100
New Hanover Agricultural Society ...	100
Underberg Farmers' Association ...	200
Pietermaritzburg Agricultural Society...	200
Polela Agricultural Society	100
Malton Farmers' Association ...	100
Cape Department of Agriculture ...	50
Rhodesian Government	50
H. D. Hulme	25
R. Wood	25
J. B. White	25
W. P. Grey	25
F. W. White	25
Zululand Agricultural Society ...	25
W. McFie	25
J. Gordon	25
Boston Farmers' Association... ...	25
J. Siddons	10
E. C. Nuss	10
J. Willson	10
E. Graham	10
Camperdown Farmers' Association ...	200
Klip River Agricultural Association ...	100
Noodsberg Road Agricultural Association	100
Lion's River Agricultural Association ...	100
E. B. Griffin	20

MAPSTONE OATS AT UMLAAS ROAD.

Copy of letter.]

Dear Sir,—The Mapstone oats, as I reported you some time since, were planted at the end of January. They were planted after potatoes, the ground being heavily dressed with kraal manure (this says a lot for these oats, for, generally speaking, all forage gets the rust when planted with kraal manure ; at least I have always found it so). Alongside of these oats I planted a bag of Algerian on the same date, both being treated alike. The Algerian took the rust so badly I had to cut it, but it has grown again and will make half a crop ; no rust in it now.

The Mapstone oats stood through the winter and came into full ear before the first rain. No irrigation was used. The fifty pounds of oats I planted very thinly, and spread it over about 1½ acres. I reaped 700 lbs. of seed oats and 4,000 lbs. of straw. I intend experimenting a bit with the oats this season, and shall plant a little in October, November, and December and the balance in March, without irrigation. January is too late or too early with me, as it would not corn in the winter.

Yours truly,
(Sgd.) H. BAKER.

Umlaas Road,
October 15th, 1901.

Paspalum Dilatatum.

NOTICE.

THE Minister of Agriculture would feel obliged if those who have been supplied with small quantities of the above seed would be so good as to answer the following questions :—

1. When did you sow the seed ?
2 (*a*) What was the character of the seed bed soil ? (*b*) was manure used ? (*c*) if so, of what kind ?
3. Was the seed bed always moist from rain or artificial watering, or both ?
4. How long did the seed take to break through the ground ?
5. Was the trial of the seed a success or was it not ?
6. Have you any suggestions to offer ?

Replies may be sent O.H.M.S. to—
The Hon. Minister of Agriculture,
Maritzburg.

Locusts in the City.

ON Saturday, the 12th inst., a rather large swarm of locusts passed over the City, travelling from north to south. Not a few of the stragglers found their way into the offices of the Ministry of Agriculture situated on the top floor of the Colonial Buildings. Some of these were collected by the Entomologist and kept under observation, as from their unnatural reddish colour they appeared to be suffering from an attack of "locust fungus" in an incipient stage. The locusts caught all died between Saturday and Wednesday, during which time the fungus had made its appearance in the form of a sparse coating of velvety hairs upon the underside of the body.

Cattle Feeding and Calf Rearing by Hand.

ON the evening of the 22nd inst, under the auspices of the Farmers' Conference, Mr. G. D. Alexander delivered a highly interesting lecture on the feeding of cattle and the rearing of calves by hand.

Regarding the feeding of cattle, and more especially cows in milk, the lecturer impressed upon his hearers the necessity of providing the classes of food which nature demands.

By copious references to recognised authorities he showed what were the demands of nature, and how it was the essence of good farming to provide those demands, and, of course, at the lowest expenditure. He dwelt at length upon the futility and the evil consequences of supplying food deficient in what nature calls for, and clearly demonstrated the necessity of the food being "well-balanced," that is to say, having the proportions of protein, carbo-hydrates, ether extract, and ash requisite for physical development and the production of milk.

His remarks upon calf rearing by hand, based upon practical experience as well as by reference to what is almost the universal practice of the whole world, were of special interest. Of the various artificial calf foods he had tried he found Bibby's to be decidedly the best. Cotton seed cake he discovered at great cost to be absolutely fatal. He asserted that the estimated cost of feeding a calf from the cow —taking milk at 6d. per gallon—was £6 11s. 3d. for six months, whilst by separated milk, and what was known as cream equivalent, the cost was £1 19s., taking the cost of separated milk at 1d. per gallon. Several portraits of two months' calves entirely hand fed were exhibited, and they were in every respect pictures of what calves should be. All the work connected with the feeding is done by kafirs. Hand rearing, for a long time, has been recognised by many farmers as certain to become general in the Colony sooner or later, and Mr. Alexander ably made it clear that it is unattended by the host of difficulties and drawbacks too commonly advanced by those opposed to a change from the present system.

District Reports.

BULWER, 18th October.—During the last fortnight heavy rains have fallen throughout the Division accompanied by very cold weather. We had frosts for two mornings, in some localities very severe, cutting off the kitchen garden plants and vegetables to a serious extent. I have no doubt the young fruit just formed on the fruit trees has suffered too, though not perceptible at present. The Drakensberg has hardly been free from snow for the last ten days, which fully accounts for the excessive cold winds we are experiencing. All kinds of stock as far as I know are free from disease in the District. Stock owners have suffered losses during the last cold rains, but I have heard of none serious.

H. W. BOAST, Magistrate.

INGWAVUMA, 30th September.—Heavy rains have fallen throughout the District. The total rainfall registered was 8·46 inches. The maximum temperature was registered on the 10th September, viz., 79 deg., and the minimum on the 18th September, viz., 46 deg. In consequence of the early spring natives are now busy planting, and in many gardens the mealies sown are already commencing to sprout out of the ground. The outbreaks of lungsickness in the District do not appear to be spreading, and the disease seems to be dying out. No fresh outbreaks were reported during the month

R. COLENBRANDER, Magistrate.

NEW HANOVER, 21st October. — The weather, from an agricultural point of view, has been all that could be desired. The soil, after the copious rains, is well fit for the plough. Stock is in excellent condition and, as far as I am aware, healthy.

A. RITTER, Magistrate.

UBOMBO, 4th October.—Some very cold weather was experienced during the past month. On fourteen out of the thirty days rain fell, yet the quantity registered was only 4·71 inches. The minimum temperature was 48 deg. and 89 the maximum. No sickness among stock was re-

ported, but sixteen goats and a heifer were taken out of the District, principally from the vicinity of the Magistracy, a very unusual circumstance. Whether their removal is attributable to the fact of the fresh meat (game) supply of resident Europeans being put a stop to during the present close season, or to fear of a raid from looting Boers, it is hard to say, as natives are always prone to give reasons diametrically opposite to the actual on such occasions. Crops of mealies, kafir corn, and ground nuts are, so far, in evidence about the low-veld Coastwards, while on the mountains, north and south of the Umkuzi, kafir potatoes, mealies and kafir corn are being planted.

A. R. R. TURNBULL, Magistrate.

WEENEN, 19th October. Several stock thefts have lately been committed by natives in this District, and in each case the arrest of the offender has been secured. One of these is a man who only a few months ago completed a term of imprisonment on a similar charge. But the punishment then meted out to him has certainly not acted as a deterrent, for he is now awaiting trial for the theft of a cow from Mr. O. Rottcher, of the Golden Valley. The animal was stolen in a very daring manner; driven for about 20 miles, and then exchanged to another native for fifteen goats. Sales of this nature in defiance of the Pass Act are, it is to be feared, of frequent occurrence, and the way of the cattle stealer is thereby rendered easy In this instance, the purchaser has been severely dealt with but in most cases the facts are never brought to light. A considerable amount of carelessness exists also on the part of stock owners in regard to the issue of passes to natives. Despite the fact that printed forms in conformity with the Act may be had on application to any Magistrate, informal passes on slips of paper are often issued, with the result that the drivers are rendered liable to arrest by the police. Three such cases have been brought to my notice during the past week. Rain fell on five days of last week, amounting to about an inch and a quarter. The highest temperature so far for the month was 98 deg. on the 4th, and the lowest 42 deg. on the 14th. A plentiful crop of young grass covers the country from Thorn lands to high veld.

C. G. JACKSON, Acting Magistrate.

Correspondence.

To the Editor Agricultural Journal.

TEMPERATURES AND WORM MEDICINES.

SIR,—Will you kindly tell us through the columns of the *Journal* what is the normal temperature of the horse and ox; also a reliable prescription for worms in horses, as each person seems to have his own peculiar concoction. The horse balls we have bought from time to time for worms have not given good results.

Yours, etc.,

J. H. COATES.

Native Mission,
Inyoni, Zululand.

The temperature of the horse and ox varies considerably with the different conditions of exercise, exposure, whether pregnant or not, atmospheric conditions, etc., and such fluctuations are perfectly consistent with health. The average temperature of the horse is about 99·5, while that of the ox is about a degree higher (100·5), the normal temperature of calves being again about a degree above that of the adult ox.

It is not possible to give a prescription for any reliable vermifuge (or worm medicine) without knowing the species of worm. For instance, small round thread worms are expelled from the body by certain drugs which would prove harmless to the various tapeworms, and these latter will be killed by medicines producing no result upon such parasites as bots.

If your correspondent will write more explicitly I will try to advise him. In the meantime regular small doses of sulphate of iron will do much to produce a condition of the alimentry canal unfavourable to the prolonged stay of parasites of all sorts.—H.W-P.

BIRDS AND YOUNG MEALIES.

SIR,—Can any of the readers of the *Journal* tell me anything (short of killing them) which will prevent birds pulling up the mealies just as they spring up. Those which trouble us are the weaver birds or "amahlogohlogo." I read in the "American Agriculturist" that a coating

of coal tar to the mealies would prevent the crows from pulling them up. I tried it, but our birds pull them up just as badly as ever.

Yours, etc.,

ARTHUR L. ALLKINS.

Silstone, Verulam.

A satisfactory answer to Mr. Allkins's question would be of very great value. These bird depredations are a serious matter on the Coast. A planter living also near Verulam, in a letter to the Editor not intended for publication, casually referred to the same subject. He said:—I have 100 acres of mealies coming up, and am having a troublesome fight with the small birds. Twenty Coolie children are on the land to keep the birds moving and to drive them over to a man who shoots them with No. 8 shot. If this were not done I should not get a single mealie head. Last year I expended 10lbs. of powder and two bags of shot on the birds. We don't at any rate require a law in our parts to protect small birds; they are a costly nuisance, and nothing but powder and shot have any effect on them.—ED., *Ag. Journal.*

"ROCK" GUANO.

SIR,—Can you or any of your readers inform me as to the difference between ordinary guano and rock guano?

Yours, etc.,

C. S. D. OTTO.

Shawlands, Nottingham Road.

"Rock" is a term which came into use when the trade in Peruvian guano with Great Britain sprung into existence some fifty years ago. Guano in most places where it is found is roughly classed into three layers—top, middle, and the lowest, which is called "rock" or "crust." The upper layers have most organic matter, but the lowest is richest in phosphates and greatest in manurial value. The Cape "rock" guano costs nearly a pound more per ton than the "ordinary" or upper deposits.—ED., *Ag. Journal.*

India Rubber.

CULTIVATION AND PRODUCTION.

An Idea by ANTHONY WILKINSON.

SOME years ago I tried an experiment of planting an acre of "Manihot Slaziovii," or the Ceara rubber tree of South America. Mr. Medley Wood, Curator of the Durban Botanic Gardens, was kind enough to furnish me with roots and cuttings of Cerea trees from trees he had growing in the Gardens, and wished me to try the experiment on a larger scale. I planted an acre of Manihot with coffee plants between. The rubber trees grew well and seeded abundantly, and at four years old, when the trees got a good size, 4 to 5 inches in diameter, on scoring the bark to extract the rubber, although the rubber was of good quality and very elastic, the collecting or getting it was slow and costly. Accordingly I came to the conclusion that the experiment would not pay, unless the trees could be tapped, and the juice collected in quantity, as is done in South America, and further, that Natal was not sufficiently tropical to make a good flow of sap. Coming to those conclusions I cut the trees down, but still the trees come up again from the seeds every year, and grow luxuriantly 5 or 6 feet high in the first year, showing the climate to be suitable to their growth. Among my coffee I have a self-sown Ceara only three years old and over twenty feet high. The red sandy soil of the Coast such as that of the Berea, Durban, would be the most suitable. The seeds left to nature do not come up for a year or two. By some, filing is recommended, but this is a tedious process; tapping them with a small hammer until they crack serves as well, and is much quicker.

The plan adopted to collect the rubber with the Cerea rubber trees is to strip off the thin outer bark, which is like

brown paper, and expose the green bark. This inner bark is then scored across with a knife at an angle, and the milky juice or sap then exudes and dries on in an hour or two, and can be peeled off and wound up in balls, but the process is so slow with the Coolie women employed at 6d. a day, that I found it would cost about 5s. per lb. for the labour of collecting, and the product would be worth only about 2s. per lb.

Now it strikes me very forcibly that if a cheaper way of extracting the rubber were adopted it would pay well. The rubber is there of good quality, but the question is how to get it out. My idea is this: To plant the trees in rows, 12 or more feet apart, like large hedges, and at two or three years old, when large enough, in the spring or early summer, when the sap was rising, to slash off the small branches and leaves, and crush them in a small steam sugar mill and let the juice run into a tank of water. The residue of branches and leaves would then be put into a hydraulic press, with steam outside, and pressed as long as the sap would flow. The rubber juice would coagulate in the water, and could be raked out and squeezed by hand into balls and dried.

By this method the trees would be pollared and dwarfed, and could be trimmed and cut once or twice a year, as found advisable. It would be necessary to keep the land well ploughed and scarified between the rows, for all would depend on the cultivation received. The rows, if in hilly land, would require to be run on the level, so as to cultivate cheaply with horses or mules.

There are several other plants which would give good rubber if treated in this manner and well cultivated.

The Beaumantia, a white flowering creeper of the order "Apacynaceæ," the Borneo rubber creeper, grows well here in Natal, and I have no doubt many native plants would be found to produce good rubber.

If this plan of extracting rubber from the plant were found to answer, it would revolutionize the rubber trade in a few years, and rubber could be grown to any extent, like sugar.

Moreover, the supply of rubber, owing to the destruction of the trees, is decreasing, whilst the demand for the article, which is now being applied to so many different purposes, is steadily increasing, and therefore there is no fear of the market being over-stocked. India rubber being so valuable an article, worth £200 to £300 a ton, there is a large margin for profit. For an energetic young man wanting something to do and to try a new industry, I would recommend it, but remember the old American sage's saying: "Be sure you are right; then go ahead." I feel pretty sure there is money in it.

If further information is required on the article "India Rubber," see Spon's Encyclopedia and Encyclopedia Britannica, where it is more extensively treated.

The Basuto Pony.

MR. J. W. BOWKER, Mohali Hoek, writing concerning the origin of the Basuto pony, says:—From personal knowledge of Basutoland extending over a period of upwards of thirty years, and from facts in my possession, I am prepared to assert that in the early part of the 19th century horses were entirely unknown among the native tribes inhabiting the eastern portion of South Africa. It is an historical fact that the first horse seen in Zululand was taken there by the Chief Dingiswayo returning thither from the Cape Colony in the early days of the afterwards renowned Chief Chaka. This I think disposes of the theory of there having been a native race of horses in that region introduced from the north by Arabs. It is also an historical fact that the country now called Basutoland was at that period only occupied by roving bands of Bushmen, and that the tribes afterwards known as Basuto were driven by Chaka from the east of the Drakens-

berg. Moshesh, who was the founder of the Basuto nation, came to the front about the time of Chaka's death (1828)). It is well known that the first horses ever owned by the Basuto were obtained from the farmers in the territory of the Orange Free State, about 1845. This commenced a trade in horses between the farmers of that territory and the Basuto, which was carried on briskly up to the year 1865, at which time the Boer-Basuto war broke out, which lasted for several years. The trade in horses was subsequently renewed, hundreds of horses being taken into Basutoland and exchanged for cattle and grain, amongst them being a considerable number of well-bred stallions. In addition to the horses so acquired, large numbers of Basuto were employed by the farmers as servants, and were paid to a considerable extent in stock, including horses (mares). Owing to the severity of the winters in the mountainous region, the progeny of these horses, while retaining many of the valuable qualities of their progenitors, and perhaps improving in hardiness, became more or less stunted in size, and gradually developed into what is now known as the Basuto pony. During the last ten years a number of so-called Basuto ponies have been successful in Johannesburg and other racing centres; most of these can be traced, either directly or indirectly, to the Free State. Take, for instance, that well-known chestnut pony Peter, who was sold in Johannesburg for £500. He was bred in the Orange Free State, as was also Bafar, another well-known pony, and others, including Soldat, the fastest pony in Basutoland at present. Scottie, the fastest galloway here at this time, is a son of Honesty, who was well known as a racer in the Orange Free State, and was, I think, a son of Champagne Charlie.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 4th December next :—

Harding.—Bay gelding, about 13·2 hands, black points, near hind fetlock white, switch tail, white blaze down face, branded P on near hind quarter.

Mooi River.—Red Yearling ox, piece out tips both ears, branded on left hind leg FB or PB, little white on belly. Running on the farm Rose Mount, undersized dark-roan yearling heifer, no brands or marks.

Estcourt.—Running on the farm Beaconsfield, chestnut mare, white face, near hind leg branded K on thigh, chestnut foal at foot. Two-year-old bay filly. Small bay mare, long tail. Bay gelding, branded JG on near thigh. Cream mare, branded on off thigh ΛE. Brown mare, branded on off thigh ΛE, two white hind feet, brands faint and indistinct. Brown mare, long tail, no brands visible.

Weenen.—Running on the farm Riversdale, dark-bay gelding, about three years old, no brands or marks.

Port Shepstone. — Bay pony, black points, long tail and mane, with white hind fetlocks. Dark-brown pony, white star, white fetlocks, left eye injured. Black gelding, speckled white hind fetlocks, stands about 14·2 hands.

Acton Homes.—Bay mare, indistinct brand on left leg, looks like P5 or PS. Bay gelding, hollow back, indistinct brand on left leg, looks like P5 or PS.

Boston.—Dark-bay or brown horse, one ear slit, low in condition. Running on the farm "Inhluyani," black-and-white heifer, about three years old, both hind feet, belly, flanks, and half of tail white, no brands visible.

Nqutu.—Brown mare, both hind fetlocks white, about 13·2, no brands. The black mare advertised for sale in Government Notice No. 498, of 10th September, 1901, has been lost from the Nqutu Pound since the 6th instant.

Woodend Pound. — Blue-and-white bull, about two years old, no brand, value about £6.

The earliest mention of Epsom as a racing centre occurs in the *London Gazette* of 1703; three plates of £30, £10, and £5 value were to be run for. In 1704 a meeting was held, but only one plate was offered, and that worth but £20. Racing at Epsom has been continuous since 1730.

My Old Gun.

By "Hippias."

THOUGH familar with the use of a gun from very early days I was never more than an indifferent shot. Indeed, a serious defect in the organ of sight, caused by convulsions during the process of teething, threatened at one time to incapacitate me for all outdoor pursuits. I was afflicted with a very decided squint, which, after the most eminent oculist of the day had been consulted in vain, yielded to a simple but till then undiscovered remedy—that of severing the contracted muscles, and allowing the eyeball to recover its normal position. I cannot, even now, recall the operation without a shudder; though, indeed, it was more alarming in prospect than actually painful. But after the second operation (for both eyes could not be treated at once, and a considerable interval was deemed necessary), I lost patience at the confinement, and finding the house deserted one fine afternoon, took rod, reel, and flies, and soon found myself at Sarsgrove pond, with a soft breeze blowing and the trout jumping like a schule of mackerel. Noticing one bigger than the rest beyond casting distance, and, boy-like, forgetting all about the eyes, I waded in, caught the big trout, and for the next twenty minutes or so, had a good time; when my father appeared on the scene, alarmed and angry, and lamenting that a son of his could be such a fool. He was quite right, for next morning I had a dozen leeches on my face and forehead, and it ended in a third trip to London, when the granulations, which had formed in the corner of the eye, were cut out with scissors, and a very nasty job it was. The cure, however, was at last complete, and the strabismus vanished; but there has always remained this peculiarity—that the eyes have never acted in concert, but have performed separate functions, one, that of close sight, of which reading is the chief instance; the other, that of looking at distant objects, though the distance is, of course, limited, in comparison with the range of unimpaired vision. Perhaps, for this very reason, doing single instead of double duty, my yes have hitherto retained their powers undimmed by age; and though very small print is a grave obstacle, no ordinary book presents any difficulty, and the habit of reading in bed, contracted at Winchester, is still continued without any ill results.

Many a vulgus, as the daily task of three couplets of alternate hexameters and pentameters was called, have I worked off on my pillow, the tallow candle flaring on the shelf set against the wooden curtain of the old college bedstead, and the extinguisher standing ready for the sound of the Doctor's or Ridding's master-key, for the detection of a light after 9 p.m., other than the "puncture" (a rushlight burning in an iron sconce against the chimney) was invariably followed by a "scrubbing" or four strokes with the rod, at the conclusion of morning school. As this rod consisted (I quote Mansfield's "School Life at Winchester College") "of a wooden handle with four grooves at one end, into which were inserted four apple or birch twigs, branching off from the handle at such an angle that not more than one could touch the space of skin exposed—about a hand's breadth of the small of the back," the reader may conclude that the punishment was not much dreaded, and was generally preferred to the alternative of an imposition—30 lines of Virgil, English, and Latin—which kept the victim in school and forbad the delights of fives or football. With regard to the rod, it was invented by Warden Baker somewhere about 1460, and is mentioned in a Latin poem by Christopher Johnson, who was headmaster from 1560 to 1571, and of whom Anthony Wood speaks as "a most excellent Latin Poet, Philosopher and Physician of his time" in a single line so graphic that I cannot help quoting it:—

Qui quadripartitâ bene corrigit omnia virgâ

But this is a digression. I shall never forget the day on which I first discovered the peculiarity of vision which I have described above. We were shooting Churchhill Heath, an outlying cover on my uncle's estate. I was with the dogs and beaters, and we had just reached a planta-

tion of larches that stood in a corner of the cover, when a hen pheasant, flushed by the spaniels, rose almost under my feet. She was, of course, taboo, but the keeper, wishing to give me a chance, shouted "a bird to you, Mr. Charles." So I put gun to shoulder, and took sight. Now, as the bird rose straight up between the trees, and the gun was elevated perpendicularly, my left eye caught the sight, and the bird fell dead.

Reasoning upon this incident, I soon made up my mind (for the deduction was obvious) to shoot henceforth from the left shoulder; and, after a little practice, I found not only that the gun came up quite easily, but that there was a decided improvement in my shooting. So thoroughly did I carry out the idea, that when I ordered my first gun, made by Best, of Oxford, I had the stock set purposely for left-hand use; and from that day, though I never distinguished myself, I could hold my own among average shots either in cover or in the stubble or turnip field. The gun was perfectly plain, being made for hard service rather than for show; but locks and barrels were tested and passed by one whose word on such subjects was more than law, and I believe that a better weapon for driving and hard hitting with shot of all sizes, from dust to loopers, was never turned out of a gunmaker's shop. For a smooth bore its effect with a hardened bullet within 60 yards was marvellous, and up to that distance no rifle could shoot truer. The gun was not very safe in strange hands, as the upper trigger discharged the left barrel; but I was, of course, familiar with its peculiarities, and they at least afforded an excellent excuse for declining to lend it even to one's most intimate friend; though the old rule which restricted the use of horse or gun to the owner thereof had not yet been superseded by the profuse hospitality of the millionaire, who counts his guns by racks, and his studs by stablesful, the average sportsman being content with one gun and perhaps a couple of hunters on which he put their full value, and that a high one.

With that same gun (it was only a 14 bore) I killed my first and last eland (for I never had another chance) across a kloof in the big Noodsberg, after a tearing gallop of two or three miles. My first buffalo (but by no means my last) was lying in long grass near the mouth of the Umlalazi. I got a shot at him also across a kloof, or wooded donga, at full fifty yards distance, and struck him between the ribs; and when I ran him down on the bank of the Matikulu, and gave him his *coup-de-grace* as he lay struggling on the ground, my bullet just showed under the skin on the opposite side to that which it had struck, and a slash of the knife brought it out. One more instance and I have done. It was in the winter of 1855 that Capt. Stephenson, Long Francis,as he was called, of the Umgeni, and the writer, with a following of boys—half-breeds and native carriers—were making their way between St. Lucia Bay and the Pongolo, and were approaching the latter river. We had just entered a strip of the Coast bush through which the path runs, and were in single file, Stephenson leading. A sharp turn in the path disclosed an opening in the forest of green grass, with an oblong pool in the middle; and in this pool, squatting on his belly, with his rump towards us, was a huge white rhinoceros. Stephenson turned, and made signs for the Kafir to hurry up with his big rifle, which carried a conical bullet, three to the pound. I was left in front, with the old gun in my hand, for the moment. Just then the brute, catching our wind, sprang to his feet and swung round. As I caught a broadside view of the neck, I took steady aim and fired (the distance was not more than 20 yards), and lodged the bullet in his windpipe, which effectually crippled him; though it took several discharges of the big elephant gun to stretch his ungainly carcase on the soil. The beast was adjudged to me; but beyond my share of a glorious breakfast which the hoof afforded, when dug out of a hole over which the camp fire had been kept burning for some ten or eleven hours; and a strip of hide which for years formed the achteros sjambok of the Start wagon, I got, to use the language of the market, but little profit out of the transaction.

The skull may be lying there to this day, for no grass fire could reach that green spot in the forest; and 45 years would make little impression on that

mass of bone, when once the white ants had stripped it clean of all impurities, and left it among the rustling leaves. I have found an elephant's jaw and teeth in the Start woods that had in all probability been exposed there for a much longer period, but showed no symptoms if decay.

My first seacow must also stand to the credit of the old gun. I had been popping at noses the whole of a bright afternoon on the sandy shore of the lagoon which stretches up from the mouth of the Matikulu, with no other effect than that of cutting the placid surface into a thousand ripples; when, just before sundown, a monstrous head rose quietly out of the water, and was instantly greeted with a bullet. The head sunk at once, noiselessly, and without motion—a sure sign that the bullet had gone home; and knowing that the creature would not rise again for many hours, I walked back to my wagon, and slept the sleep of the tired hunter. In the morning we found the body floating, and I had the unpleasant task of swimming out with a long riem, or chain of riems, and making it fast to a leg. Unpleasant, indeed, for the river swarmed with alligators; but by dint of thrashing the water with sticks, and throwing big stones as near the carcase as we could, either we frightened them away, or they were off on some other quest, for I swam back unmolested, and we hauled our quarry to land.

For weeks the long strips, cut from the back and sides, hung in festoons along the wagon tent, furnishing many a savoury and wholesome meal, and making even tough Buffalo meat palatable; for seacow fat is better than the best bacon, and you are never sated with it. I say is, but I fear it should be "was"; for the seacow is worse than a patent mowing machine in a crop of oats, and he leaves nothing for the rake; so he had to go.

Whether he is still to be found in the lake to which he gave a name in Victoria County I know not. The last I saw in Natal was shot early in the year 1855, in the Umgeni, a mile or two above the Albert Bridge; but long after that they used to feed on the forage crops at Malton, till Mr. Florey frightened them away by the nightly discharge of a blunderbuss. As for the gun, many a haunch of inkonka, tender and tasty as four-year-old Welsh mutton, did it provide for us at the Start, not to mention a couple of leopards, which were shot by my black keeper, Qinalitshona, *alias* Jack. Into his possession at length, with the consent of the Governor, the old gun passed. It was about the best of the muzzle-loaders, and is now out of fashion and out of date; but given a breechloader of the same quality, its owner, if he could hold it straight, would be a match for any beast of the field, pachyderm or otherwise, from an elephant to a Bengal tiger.

Report on Irrigation in Natal.

By Colonel F. V. CORBETT, R.E., Irrigation Expert.

(*Concluded.*)

APPENDIX I.—PERSONAL.

I ARRIVED at Pietermaritzburg on 25th May, 1899, and after a few trips to various parts of the Colony I submitted a short preliminary report on 21st July. At about this time it was advertised in the *Agricultural Journal* that my services were available to the public on application to the Commissioner of Agriculture, and it was subsequently made known that no fees would be charged. I visited several farmers by appointment, and gave them advice with regard to minor irrigation works. In August, at the request of the Minister of Agriculture, I visited the Coast, staying for a short time at Mr. Reynolds' Sugar Estate, near Umzinto, and with Mr. Saunders on the Tongaat Estate, and on as far as Stanger. From the date of my return to Maritzburg, about the end of August, rumours of war began to unsettle matters, and, on trying to make appointments with several applicants in Klip River and

Umvoti Counties, I was met with excuses and postponements. By the middle of October it was evident that little or nothing could be done for several months, and accordingly I suggested to the Government that I should be allowed to proceed home for six months, that period being considered as a break in my service of two years. This suggestion was accepted, and accordingly I proceeded on leave 26th October, 1899, and returned 14th May, 1900.

2. I at once resumed my visits to farmers, whom I found not at all generally aware that they could obtain my services gratuitiously by applying for them. I, therefore, had a letter circulated through Agricultural and Farmers' Associations, and this certainly produced a few more applications. But, up to the time of writing, I still frequently find a disinclination to apply, and a tendency to wait until I am known to be in the neighbourhood; when, as likely as not, the application is too late for that tour. Farmers often think their case such a small one that they hardly like to send for me; also, they are often not prepared to embark at once on any expenditure, and for that reason hesitate to apply for my services.

3. I soon began to find that I was making very little progress, taking separate trips by rail from Maritzburg, and from the railway to farms in the vicinity, conveyed from the station by the applicant. Much of my time was occupied by railway travelling, and, unfortunately, all the Government mules were "at the front," and I had no means of making continuous tours.

4. On 11th July, 1900, however, the Chief Engineer, P.W.D., kindly arranged to lend me a trap and pair, with which I journeyed by Richmond, Ixopo, and Harding to Port Shepstone, and thence up the coast to Durban; but I was again unable to get a trap until 4th September, when I took a tour in Weenen County and to Ladysmith. Just after this tour the Government mules returned, and I have since only had to ask for anything I wanted in the way of transport.

5. In Appendix II. are a few rough notes of some tours, and in Appendix III. a list of the cases that have come before me up to 31st December, 1900, with a brief abstract of each; also, a classified abstract in Appendix IV. I think there is no doubt that had there been no war and no difficulty about conveyance (which difficulty, too, was due to the war), there would have been a good many more cases on the Register.

6. I have made some visits to Ladysmith, Elandslaagte, Waschbank, Dundee, Dannhauser, &c., but have not yet been able to go freely about the whole of the Klip River County; this I hope to do in the course of the next few months. Polela will, I hope, be visited in February. [Polela and Underberg since visited. Conditions most favourable. Plenty of streams and good soil in valleys; easily watered. With a railway, this country should flourish exceedingly. Hail is a drawback.]

7. In August, 1900, I purchased 20 copies of an American work on irrigation, entitled "Irrigation for the Farm, Garden, and Orchard," by Stewart, and have sold 16 copies to farmers. The price is only 3s. 6d. per copy, and the book contains much valuable information. I have ordered 10 copies of a still better book, "Irrigation Farming," by Lute Wilcox, the price of which will be about 5s.

It is to America that Natal farmers should look for the results of experience in small irrigation works.

Appendix II.—Notes on Some Tours.

1. Tugela and Little Tugela Rivers, Colenso Flats, Gourton, Springfield, Upper Tugela—visited (with Commissioner of Agriculture) 21st to 25th June, 1899; also, alone 4th to 18th September, 1900.

There is a large stretch of good soil on the right bank of the Tugela, from Springfield to Colenso, extending some miles from the river. Only a comparatively narrow strip can be commanded by the Little Tugela; the best place to take out a canal was pointed out to me by Mr. G. C. Williams in 1899, a little above the bridge. It would, no doubt, be possible to take a canal out from the main Tugela, a little above the junction, and possibly this water might be combined with that from the little Tugela; but the works would be expensive, and it seems likely that the Little Tugela alone will give enough water for the strip of land that

could be commanded. The area of this would be something like 5,000 acres, or possibly a little more, and the ordinary winter supply of the Little Tugela is about 100 cubic feet per second, which is sufficient to water something like 10,000 acres.

The lands further south, about Gourton, cannot be commanded except within the limits of the valley of the Little Tugela. A small canal is being taken out near Gourton, with good hopes of success, but it would have been better to have a survey made.

About Springfield there is a good deal of interest in the water question. Another furrow is proposed from the Little Tugela, from the place I have indicated as suitable for the head of a public canal. Survey recommended. Beyond the Upper Tugela a furrow is proposed from the Losonjo River; this can be carried out without much difficulty. It should be surveyed to make a good job of it, but this, I fear, will not be done.

One or two farmers think of pumping by steam from the Tugela, at Upper Tugela, but they are postponing action until they are in better communication with a safe market.

2. Richmond, Ixopo, Harding, Port Shepstone; up coast to Durban, Umgeni, Verulam, Tongaat, Stanger, and Nonoti—5th to 31st July, 1900, and 4th to 11th August, 1900.

There is a good volume of water in the Illovo at Richmond, but I have not been shown any land on which it can be utilised. A few small schemes from spruits in this neighbourhood, but the sub-soil is very porus, and irrigation is very difficult to carry out. On one farm I found the water chiefly used for irrigating pasture land.

Near Moguntia irrigation asked for on a farm on the Umzimkulwana River; requires to be pumped up 100 to 200 feet. Could be done by turbine or hydraulic ram, but would hadly pay in present state of communications. Valuable crops and high farming are also necessary conditions.

At Port Shepstone, advised about water supply, and about a small project for piping springs from top of hill for fruit cultivation.

At Lower Illovo there are some nice flats covered with sugar cane; these could, and should, be irrigated by pumping from the river with a Gwynne's centrifugal pump. At Isipingo also the flats could be more or less watered from the Umlaas. Before purchasing plant, investigation should be made as to possibility of a gravitation scheme. Not much chance of it.

At Umgeni, a pumping plant for irrigating sugar cane has been installed, and is delivering a good volume at 270 feet lift.

At Verulam I was shown a few springs with reference to the water supply of the village. These springs are weak, and there appears to be no source of supply but the river, whence water could be pumped, as in a scheme drawn up some years ago.

At Tongaat, the watercourse from the Tongaat River for the sugar mills was nearly completed; it will also do some 200 or 300 acres of irrigation.

The Umvoti flats could, apparently, be irrigated without much difficulty; they seem to be cultivated in patches by Indians.

I twice visited the Clifton Tea Estates, near Kearsney. It would be possible to pump up water from the Nonoti by turbine power, but it would be some 250 feet lift, and I don't think tea would repay the expense, as the need for irrigation for that crop in dry seasons (except for young plantations) is open to question

3. Mid-Illovo, Umquahumbi Valley, Umkomaas, Bulwer, Boston—8th to 23rd October, 1900.

A small spruit near Fairview could irrigate 20 or 30 acres of land close by, but the owner of that land does not wish to cultivate it. It will be utilised by another farmer, but there will be a good deal of loss in transit.

The Natal Tobacco Co. are going to start cultivation in the Umquahumbi Valley. There are two cultivable plots that can be irrigated, one (or, rather two, one on each side of spruit) of about 40 acres, which can get water by gravitation from a small tributary, and one of some 200 acres, for which pumping by steam or water-power to a height of 100 feet or so will be necessary.

The irrigation of the tobacco plants will be carried out by spraying, as far as pos-

sible. This will, no doubt, economise water, and have the best effect on the growth of the water.

There are several flats in the Umkomaas Valley that could easily be watered; there is one on the right bank, near the bridge on the main road, and I am told that many hundreds of acres of flats further upstream are already under irrigation. There is one nearly opposite the Inkunya Hill that can, apparently, be easily commanded.

In the neighbourhood of Greenvale, near Polela, two spruits were shown to me which have sufficient permanent supply for 50 to 60 acres each, and I think channels will be taken out. The soil seems fairly suitable, but some of it lies low and its drainage must be attended to.

Missed going to Underberg by not getting letter in time. There appears to be some outlook for irrigation here, and I hope to visit in February.

I had no appointments between Bulwer and Maritzburg; most of the land is "Native Location."

5. Riet Vlei—1st to 4th November, 1900.

There is some irrigation in this neighbourhood. There are some nice spruits, and I should like to see it again after a year of normal rainfall.

5. Ladysmith, Dundee, Dannhauser—26th November to 1st December, 1900.

There are some flats near Modder Spruit that can be partially irrigated; the permanent supply is very small. It can be supplemented by some diversion reservoirs. There are some flats in this Klip River County which are deserving of further examination; among others the Waschbank flats, which I visited in 1899.

There is some land on the Ingagane River, north-west of Dannhauser, which the owner wishes to irrigate from the river by pumping. Plant for doing this up to the level desired (60 to 70 feet) would cost £500 to £600, but 30 or 40 acres of the lower land could be watered by a plant of about half that cost. Some few acres could probably be done from the spruit. The pumping project should wait till the value of irrigation here has been determined by the results of the partial irrigation that can be obtained at a small outlay. And it is possible that a gravitation supply may be obtained from the river by combination of several landowners.

6. Dronk Vlei.—With Surveyor-General.

Found the Valley very dry and cultivation backward. It will not pay to take water from the Um imkulu, either by gravitation or pumping. Surveyor-General unable to stay long. Will revisit and examine means of irrigation formerly proposed. The case is not promising.

I have been several times to Greytown; there are fair facilities for irrigation in parts of the district. Borings would be useful in the "Thorns," to show whether anything can be done with wells. Apparently, some of the Umvoti Valley could be irrigated by that river, but I have not heard of anyone wishing to do this. More water is required for the "Thorns" land on the "Tsegane," but the ground it is not favourable for storage. An Artesian spring was tapped by the coal-borer some years ago at "Pompoo Nek," and it is still, or was lately, running a fair volume. I understand it comes out near the bank of a river, and does not command any arable land.

[Appendices III. and IV. are omitted; they are abstracts of cases indicated by serial numbers only.—ED., *Agricultural Journal.*]

It is calculated by the United States Department of Agriculture that for every 100 of the population from twenty-three to twenty-seven cows are required to keep the country supplied with milk, butter, and cheese, and provide for the export of dairy produce. The export trade has varied much, but has never exceeded the produce of half a million cows, whereas at the end of the nineteenth century the census showed that there were about 17½ millions in the States.

Sable sheep are not infrequently seen in this country, but ebony lambs are plentiful in the Australian Commonwealth. A colonial flockmaster had quite a number of black lambs, and he folded them in a range by themselves. He found that black lambs might not recur in a flock in generations, and then recur suddenly. For example, where a black ram was used in a flock of white ewes the product was white lambs, with few exceptions; and where sire and dam were ebony-coloured the lambs were mostly white. And so the Australians gave up the attempt to found a sable flock. Where wool is dyed a deep colour, sable wool absorbs less dye and makes a more durable colour. Still, black fleece absorbs more sun-rays than white, and black sheep are more seriously affected by heat.

Photo by the Editor.

Grazing on Cocksfoot.

THE above represents cattle grazing in a field of cocksfoot at Mr. John Moor's farm, Mooi River.

Mr. Moor in speaking of this grass to "Ergates" some months ago said (No. 7, Vol. IV.):—"I think well of cocksfoot for the district. It cannot be considered first-class for topping-off stuff for fattening purposes, but as it keeps fairly green for a long time into our winters here, it is an extremely useful adjunct to the other food. Some years ago Mr McFie, at his Highlands farm, kept, and indeed fattened, 21 sheep to the acre off it; 630 sheep on 30 acres. The sheep find green stuff at the roots of the stools, however frosted the ends may be."

Annual Dairy Report.

By E. O. CHALLIS, Dairy Expert.

PART I.

GENERAL RESUME OF WORK—OFFICE WORK.

MY work in the office has during the past two years very greatly increased when compared with the first two years of my work in this Colony. This I look upon as a healthy sign, as it shows that an increased interest is being taken in Dairy matters. I have received a large number of letters from all parts of the Colony asking for information on different subjects. In most instances I have been able to give by letter the information required, followed by a personal visit in cases where I thought it necessary.

As it would be impossible to visit personally every farmer requiring information, I consider the time spent in my

office in disseminating knowledge to the farmers through the medium of letters is time well spent. I would also suggest that when a farmer has any questions of interest to ask in relation to Dairying, he do so through the medium of the *Agricultural Journal*, for by so doing the answer could be read by other farmers who might be interested in the same subject.

To be included in office work are also the personal visits to the office of the farmers themselves. These visits, I am glad to say, are greatly on the increase, and much good is done in this way, for when a farmer has some scheme he wishes to consult me about, and brings the necessary data with him to my office, we are then able to discuss the *pros* and *cons*, and we generally manage to arrive at a satisfactory solution of the difficulties involved.

I point out these few items connected with office work in order to show that through the office a large amount of useful work can be accomplished. As such work increases, more time must necessarily be spent in the office, and consequently fewer personal visits during the year will have to be made; but, as I have already pointed out, this extra time spent in the office is fully justified.

Specially Prepared Minutes to the Minister.

This is another phase of office work which indirectly affects the farmer. Subjects of importance are constantly cropping up which have to be specially dealt with in order that the development of the Dairy industry in this Colony may be successfully carried out.

The chief matters of importance which I have constantly brought to the notice of the Government during the past two years are (1 The providing of better means of transit for Dairy Produce through the medium of specially constructed cool cars; (2) The erection of "Shade Houses" at all stations of importance on the line for the protection of Dairy Produce; (3) The absolute necessity of bringing in a General Adulteration Act for the Colony to take the place of that now in existence.

These are all matters which vitally affect the Dairy Farmers, and, in fact, the whole Colony. Therefore, I consider, it is eminently my duty to bring them before the notice of the Government; for travelling as I do, practically through the whole of the Colony, and constantly coming in contact with the farmers, I venture to remark that I know better than anyone else what is mostly required to help on an industry such as the Dairy industry, and one that is reaching greater proportions every year.

On the other hand, when a subject of importance is brought to the notice of the Government, it is only right, before they take any action in the matter, that they should receive full information on it, and should know exactly why such and such a thing is required. This being the case, it often necessitates my having to submit lengthy and detailed minutes to enable the Government to be thoroughly cognisant with what the farmer really requires It will also be well for farmers to bear in mind, with regard to such important matters as the construction of cool cars and the erection of shade houses at different stations, that a large amount of information and data has to be procured, and many details have to be gone into before a practical and satisfactory conclusion can be arrived at. This being so, much time must necessarily be spent before the farmers can see their requirements complied with.

Field Work.—Farms and Districts Visited.

I have, during these two years, paid 183 official visits to different farms in the Colony, given 10 public demonstrations in butter and cheese making, besides attending several important meetings in connection with creamery matters. The following were the different districts visited:—Weenen County, Richmond, Lion's River Division, Klip River, Polela, Ixopo, New Hanover, Noodsberg, and the Coast Counties.

In mentioning these different districts that I visited, I do not wish to imply (with the exception of Klip River) that I toured each district thoroughly, as it would have been impossible to have done so in the time I had at my disposal. In the Klip River District I made a somewhat extensive tour, visiting as many of the farmers as I possibly could; and I

endeavoured not only by practical demonstrations and experiments to teach the farmers the advantage of combining science with practice in Dairy work, but also to prove to them, by practical results, the advantage of so doing.

I made different kinds of cheeses at nearly all the farms I visited, in order to get some idea as to what quality of cheese could be produced in the different localities. All these cheeses were put on the Klip River Show held in Ladysmith on June 28th, 1899. I was thus enabled to test the several cheeses from each locality; and having made notes as to how each cheese was made, and knowing the conditions under which they were ripened, I could form some idea as to which districts were the most suitable for the production of first-class cheese. Most of the cheeses had matured in fairly good condition, but the cheeses made in the Acton Holmes and Upper Tugela Districts were superior to those made in the immediate vicinity of Ladysmith, as the climate and veld of the above districts seemed eminently suitable for the production of cheese of first-class quality, while the nature of the veld round Ladysmith, combined with the high temperature prevailing during the summer months, leads me to the conclusion that cheese of good quality cannot be produced in that district; at any rate, not with the usual facilities that most farmers have at their disposal.

As the Acton Homes and Upper Tugela Districts are some distance from any market and without any railway facilities, it seems a great pity that cheese-making is not more largely taken up, especially as the climate and veld are so suitable for producing cheese of good quality. The chief reasons why cheesemaking in Natal does not progress to the extent it should are (1) the amount of time that has to be devoted each day to making the cheese, and (2) the time a farmer has to wait before he receives any return, as the cheeses generally have to be kept four or five months before they are fit to place on the market. But still, allowing for these disadvantages, it seems a great pity that the farmers do not seem inclined to avail themselves of the splendid market that they have at their doors for the sale of well-made cheese. We are annually sending large sums of money out of the Colony for imported cheese, when an equally good article, if not a better, can be produced in the Colony, and it has already been proved that well-made Colonial cheese finds a ready market in Natal. Another fact worth noting is, that nearly all the districts that are out of touch with either railways or markets are very suitable for cheese-making; and as cheese-making is practically the only way in which farmers away from the markets can profitably utilize their milk, it is to be hoped that the cheese-making industry in Natal will develop, and in the near future assume a more progressive aspect. Co-operation on a small scale would seem to be the best way for producing cheese in larger quantities, but here, again, this method is fraught with many difficulties. To start a co-operative cheese factory on a very small scale, assuming that the cheese-making season ranged from six to seven months, it would be necessary to collect at least 250 gallons of milk per day to make it worth while to engage a man to make the cheese. If the above quantity of milk could be doubled so much the better.

To procure this quantity of milk daily it would be necessary to draw it from a very large area; and when one considers the distance most farms in Natal are apart, the absence of railways, and the prevailing rough roads that are usually found in out-lying districts, this problem of collecting the necessary quantity of milk seems somewhat difficult to solve. At the Trappist Station, Reichenau, Polela, a fairly large quantity of excellent cheese is being turned out, and their cheese-making and curing rooms have been reconstructed, and their cheese plant enlarged, so that they are now able to purchase any milk from those farmers in the neighbourhood who care to send it to them. A few farmers who are not in a position to deal with their own milk have availed themselves of this offer, and it is to be hoped that by next summer these outside supplies will be largely increased.

There is still a good demand for the fancy varieties of cheese, such as "Gervais" (cream cheese) and "Coulommiers" (new milk cheese). Since I introduced into the Colony about three years ago these two varieties of Continental cheeses,

the demand for them has yearly increased, and considerable quantities are now being sold in Durban and to a lesser extent in Maritzburg and Estcourt. It would be useless to advise farmers situated a long way from any market to go in for making these "fancy" cheeses, as they are not suitable kinds for transporting a long distance by road. But farmers within a reasonable distance of a railway or market could easily undertake to make them, and they would find that the making of this kind of cheese would be a far more remunerative way of dealing with their milk during the summer months when the markets for butter are usually glutted. In pushing the sale of these Continental cheeses from a merchant's point of view, the greatest difficulty so far has been in keeping up a steady supply. For as soon as a demand is created and the public have acquired a taste for them, suddenly the supplies practically dwindle down to almost nothing, and the natural consequence is that the demand once created is lost, and considerable difficulty is experienced in working up a sale the second time. The above difficulty of regulating supply and demand applies to all Dairy Products in the Colony, but so far the demand has nearly always been in excess of the supplies.

Agricultural Shows.

During the year 1899 I judged Dairy Produce at the following shows in the order named :—Pietermaritzburg, Estcourt, Newcastle, Bulwer, Ixopo, Ladysmith, Howick, Richmond, Durban, New Hanover, and Noodsberg. In 1900 there was only one show held in the Colony, this being at Howick. No doubt owing to the war and through the fact that this was the only show held, it was not up to its usual standard. The entries for butter were not very numerous, but the quality was very good, and the 1st and 2nd prize butters were excellent samples of what really good butter ought to be. There is no special comment needed in regard to the rest of the shows I visited. The butter exhibits at Maritzburg, Estcourt, Bulwer, Howick, Richmond, and Durban were exceptionally uniform and of good quality, although the entries might have been more numerous. At the rest of the shows, although in some instances there were more entries, there was a grea want of uniformity, and a good many of the samples exhibited were considerably below show standard, the chief faults being streakiness, excess of moisture, and an untidy external appearance. These are all faults which can be avoided in making butter, and it is to be hoped that with a little more instruction, and more care exercised on the part of the makers, these faults will in the future be conspicuous by their absence.

I should also like to see better accommodation provided for Dairy Produce in the shape of a separate stand or table. At present one too often sees butter and cheese placed in close proximity to hams, bacon, lard, poultry, etc., and this is not a very good object lesson to the public, who naturally think that, if this is the way Dairy Products are staged at shows, it must also be the way in which butter, milk, etc., are kept at the farm dairies. Several secretaries of agricultural shows have kindly made the necessary alterations, and where it has not been possible to have a separate stand for the Dairy Exhibits, they have so arranged that nothing but the bottle fruits, eggs, and bread exhibits are placed next the Dairy Products.

(End Part I.)

Captain Buckworth Powell had a curious stroke of luck over the Cambridgeshire, which was won by Lozenge in the decider after a dead heat with Wolsey. He had had a legacy of £100 from an old relative, and, much disappointed at receiving so little, decided to "have a flutter" on the race. He selected Lozenge, and, placing his legacy in driblets all round the lists, he got £10,000 to £100 and won it.

The late Sir Tatton Sykes ascribed the deterioration of English harness and saddle horses to four causes :—(1) The improvement of the roads in the principal horse-breeding districts of Northern England, whereby the saddle horse for attending fairs, &c., was displaced by the farmer's gig ; (2) the repeal of the statute which forbade the export of mares, which he considered had a far more injurious result than the improved roads ; (3) the improved system of agriculture ; when the virtue of bone manure was discovered, farmers were able to raise crops on land which had theretofore not been worth cultivation, and to put Shorthorns and Leicester sheep on pastures which, in their natural poor state, had been given up to brood mares ; (4) the spread of railways, which operated in the same way as the better roads.

Paspalum Dilatatum.

A GLOWING REPORT.

MR. A. CRAWFORD, of the Western Australia Agricultural Department, writes in glowing terms of the above grass. His remarks upon the adaptability of the grass to the most different kinds of soil, to flood or to drought, to frost or severe heat, will prove of interest. In the departmental Journal he says :—

On all sides there seems to be a general desire on the part of the farmers of this State to try and improve their grass lands, and some of the seed merchants tell me they have sold more grass seed this year than they have in the past two or three years. Among the grasses that there has been the greatest demand for is the *Paspalum Dilatatum*, some farmers having ordered several hundredweight of it. It is to be regretted that there seems to be so much trouble in getting this seed to grow. One farmer not long since informed me that he planted 20 lbs. of it, and that he did not have more than a dozen plants of it come up. It is very delicate after it first germinates, and is easily killed off, either by frost or wet, for the first week or two ; after that it is one of the hardiest of our grass plants. It will stand heat or cold, wet or dry. Last spring I saw some of it that had been under water about 2 feet deep for over three months, and the water at the time I saw it was quite a foot deep on it. It was then most vigorous, and had sent up shoots above the water. It will stand severe frost. I have it growing in my garden, and morning after morning during the past winter the frost has been thick upon it, and it is fresh and green and growing slowly. It makes but little growth in the winter months, but once the days begin to lengthen and the sun's rays stronger, it grows rapidly, and the best point is that it keeps growing all the summer through. It seems to be more suited for loose loamy or sandy soils, where it can send its roots down to a great distance. Last year I was taking up some plants that had been grown from seed the previous year, and some of the roots measured 22 inches in length, and had broken off at that. If the the whole root had been got out it would have been at least 30 inches in depth. This was in a pure white sand. Last spring I planted out a number of roots in some of the stiffest clay I could find. The clay is so stiff that in the summer it bakes just like a brick, and can only be broken up by a pick, and even then it will only break up in pieces like a coarse gravel. The plants were all sets taken from one large root. Seventy-five sets were obtained from the one root, and all grew but one. There was no attention given to the plants during the summer, either by cultivation or watering. Some were in a fowl pen, and others were in the garden. Those in the fowl pen were kept eaten down by the fowls, but there was always a green growth the whole summer through. The ones that were in the garden grew to about 3 feet high, and were cut down twice after they had seeded each time. At the end of the summer they were green and vigorous, although the ground around was as hard as a metal road.

During this past winter I lifted up one or two of the plants, and found that the roots had gone down about 12 inches in the clay, and the roots were remarkably abundant, being about twice as large as the plant itself. From the result of the experiments that I have made during the past four years, I am quite convinced that, so far as that part of the country lying between the Darling range and the sea coast from Geraldton to Albany is concerned, the *Paspalum Dilatatum* will thrive and flourish in it.

The country that is now looked upon as utterly useless except to grow banksias on for firewood, I am satisfied, can now be turned into good pasture land that will carry great herds of cattle, sheep, or horses. Anyone who wishes to get a good start with it cannot do better than get roots and subdivide them into sets, planting them from 18 inches to 3 feet apart. If planted like this and allowed to seed it will soon fill up the gaps and cover the whole ground. The roots are not obtainable in this State in any numbers, but can easily be obtained in New South Wales at a very moderate price per thousand. They carry over here fairly well, several consignments having been imported this season, and already they are shooting out.

Scientific Farming.

MR. H. RIDER HAGGARD'S third article, entitled "Back to the Land," published in the *Daily Express*, deals with Blount's Farm, Sawbridgeworth, and shows what science has done to turn a loss into a profit.

Stiff clay soils such as that of which Mr. Haggard writes are uncommon in Natal, and owing to hail wheat growing has gone out of practice, but the article, irrespective of its agricultural information, points to several morals.

One of the most deeply interesting agricultural experiments ever carried out over a series of years in England is that which has been in progress since 1861—more than a generation—upon Blount's Farm, near Sawbridgeworth, in Hertfordshire. When Mr. Prout, the father of the present proprietor, became possessed of his farm of 450 acres it was in such low condition that it was said of it "that it would starve a donkey." Also, it was undrained, made up of small enclosures, and cumbered with many fences.

Now all this has been changed. Indeed, I never saw a better arranged or, I may add, in its own fashion, a better cultivated holding. The fields are large, averaging perhaps thirty or forty acres, and pierced with convenient roads; the fences are low and well trimmed, and the drainage, that at the present time is done with the steam mole, a system of which I hope to speak in a subsequent article, is perfect. The peculiarity of Mr. Prout's farm is this. He keeps no cattle and no sheep, he grows nothing but cereals, clover, beans, and some mangolds for the horses, and year by year he sells everything off the soil that it produces. Further, he has no scruple about growing wheat or other cereals for many years in succession upon the same field, a thing hitherto supposed to be impossible to do in England at a profit. Nor does he replace the grain and straw sold off the farm by stable manure imported from elsewhere. Yet he farms at a profit.

Calling in the Chemist.

The experienced reader will naturally ask how this can be done. Here is the explanation. Four years after Mr. Prout, senior, who had farmed in Canada for ten years, took the holding in hand in a desperate condition, the happy thought occurred to him to consult the late Dr. Augustus Voelcker, perhaps the greatest agricultural chemist of his day. In 1865 he submitted to him samples of the soil of Blount's Farm. Dr. Voelcker analysed these carefully, and in his report pointed out what elements should be added from time to time to ensure the permanent fertility of the land while producing successive crops of cereals. Accordingly the chemicals were added in the proportions which he advised, and, with the exception of deep and thorough tillage and draining, every other recognised rule of farming was set at defiance.

In 1877, after twelve years of constant corn growing, and the annual sale of every stalk of straw, the land was again analysed, and found to be richer in all necessary constituents than it was in 1865. Nor, although as many as eight corn crops have been taken consecutively, does the yield lessen by a single bushel. From 1865 to the present date the same extraordinary system has been carried on with precisely the same results, nor does there seem to be any valid reason why it should ever stop. In short, the fertility of the soil is quite unimpaired.

Science that Pays.

Up to the year 1879 it was the custom of Mr. Prout, sen., to sell his crops as they stood in the field, leaving the purchaser to harvest them, but since that time, as buyers no longer cared to speculate in corn at the prevailing low prices, he and his son have done the harvesting themselves, selling the grain in the ordinary fashion, and the straw by auction. Indeed, when we visited the farm such a sale had recently been held, for we saw the tickets still fixed upon the stacks. Here it will be convenient to state that I inspected Mr. Prout's accounts, which are, however, not for publication. I will only add on this point, therefore, that he is, and in practice always has been, in the proud position of farming at a profit.

Now for a few figures. The average production of wheat per acre, I think, for the year 1895, given in bushels, was—India 10, Argentina 11, United States 13, France 17, Great Britain 28, Russia 8, Australasia 6, whole world 12. The average production in the same year for the county of Herts was—Wheat 26 and a fraction bushels, barley 29 and a fraction bushels, oats 35 and a fraction bushels; and for the county of Lincolnshire, perhaps the most fertile in England, wheat 32 and a fraction bushels, barley 35 and a fraction bushels, oats 51 and a fraction bushels. On Blount's Farm in 1895 the return was as follows:—Wheat 36 bushels, barley 40 bushels, oats 40 bushels, and beans 32 bushels. These figures speak for themselves.

It may be thought, however, that they refer to an exceptional year. That this is not so is shown by the fact that the average production of wheat on Blount's Farm, taken over a period of seventeen years, has been four-and-a-half quarters or thirty-six bushels per acre, and of barley five quarters or forty bushels per acre.

How it is Done.

The analysis of the clay lands at Blount's Farm showed its cultivators that it contained all the elements necessary to the growth of cereals, a sufficiency of phosphates and ammonia alone excepted. Their object, therefore, has been to supply these elements in just sufficient quantities to satisfy the needs of the growing crop, but no more.

By this I mean that after the removal of the crop land dressed thus scientifically should—and, as a matter of fact, on Blount's Farm does—show absolutely no loss of those constituent parts which are necessary to fertility, the main minerals, such as lime, potash, and soda, being, of course, as in most clays, present in this soil in quantities so large that it would take centuries of cultivation to exhaust them. To supply what is lacking if the crop to be grown is wheat, Mr. Prout doses the land by means of a manure distributor with 4 cwt. of mineral superphosphate per acre, which in this case would be applied in the month of January, or about three months after sowing, and 1½ cwt. of nitrate of soda per acre applied about the middle of April. It must be remembered, however, that these chemicals are absolutely necessary to each other; thus it would be practically useless to apply the superphosphates without following them up with the nitrate, or the nitrate unless it had been preceded by the superphosphates. Of this fact we saw by good fortune a very striking example on the occasion of our visit.

In one of the wheat fields the man employed upon the task had by accident missed a strip when giving the nitrate dressing, although this strip, in common with the rest of the field, had received the full allowance of mineral superphosphates. There before our eyes was the result. On either side the corn grew stout and green, whereas along the line of this defrauded strip it was yellow, backward, and short in straw. Probably there will be a difference of five bushels to the acre between the yield of this portion and of the rest of the piece.

The other points about Mr. Prout's system are that he steeps all his seed-wheat for an hour or two upon the day before it is drilled in a solution of blue stone, a precaution which he finds quite effective against the disease known as "smut," and that he invariably makes use of the steam plough, thereby saving time and money and ensuring thorough cultivation of the land. Almost before the crops are off the field the steam plough is at work in them, with the result that it is no unusual thing for him to begin drilling his wheat about September 20th, and to finish it before the end of October; that is, at the season which nature appointed, when, too, in our climate it is almost always possible to get upon the land. With wire-worm, which the use of artificials is vulgarly supposed to produce, he has not been troubled for years, rolling and the application of nitrate having been quite sufficient to keep it down.

Facts and Figures.

We visited every field on Blount's Farm, and as a sample I will transcribe the notes taken concerning two or three of them. I should add that, speaking generally, although they varied somewhat in appearance, according to the condition and tilth of the land when they were got in, the appearance of the crops, including the beans and clover, was extraordinarily good even in this season of drought, some

of the wheats standing quite 5ft. high, and showing the rich colour which denotes a perfect health.

No. 1 Field. Twenty-two acres of land under barley sown on April 19th, and dressed at a total cost of £1 5s. per acre immediately before seeding with 3 cwt. of mineral superphosphate and 1 cwt. of guano applied at the same time per acre, followed on May 14th by 1 cwt. of nitrate per acre. The crop looked splendid in colour, and was thick and level in height.

No. 2. "Brookfield," thirty-one acres. Oats after barley. Steam ploughed. Sown on October 5th with three pecks to the acre of Black Winter oats. Received on January 25th a dressing of 4 cwt. of superphosphate, and on April 19th with 1¼ cwt. of nitrate per acre.

No. 3. "Beadles Top," twenty-seven acres. Wheat after oats. Steam ploughed. Sown on October 30th with eight pecks per acre of White Chaff Browick wheat, dressed on January 23rd with 4 cwt. mineral superphosphate per acre, and on April 9th with 1¼ cwt. of nitrate per acre. Upon May 8th 10lbs. of clover seed per acre was cross-drilled among the wheat to form a layer for the ensuing year.

No One to Follow.

Although the subject is somewhat technical I have devoted the whole of this article to Mr. Prout's farm because of the great agricultural importance of the system which he follows, farmyard manure produced by his twelve horses being used only in the growth of beans and mangold. Of course, that system is only applicable in its entirety to lands so situated that there is a ready market for the sale of straw. But given this condition and that of a heavy clay soil not deficient in lime, there is no doubt that it has proved itself a triumphant success. Yet even among his neighbours no one follows his example, although this could be done at a profit in all the district of the Roothings, the only requisites being careful analysis of the soil, good cultivation, and some intelligence in the application of artificial manures. Indeed, I was informed in other parts of the county that Mr. Prout "had abandoned the experiment as a failure."

Whether or no it is a failure the reader may judge; personally I was able to discover but one drawback against it—that after a long period of growth by the aid of chemicals the corn is apt to come rather light for its bulk. Why, then, is this practice not more widely followed, seeing that even where the straw must be used upon the premises the corn lands could be profitably treated with artificials, leaving the farmyard manure to be applied to the roots, beans, and pastures, to the great enrichment of the holding?

I suppose that the answer must be looked for in the conservatism, not to say the obstinacy, of farmers at large. Still, gentlemen working their own land might follow on the path pointed out by Mr. Prout, only then they would have to reckon with their bailiffs, who as a class do not love any new thing, and by accident or design often cause that to fail which they have not discovered or approved. I should add that Mr. Prout has also a small light land farm where the same system is followed to a limited extent. Light land, however, does not lend itself so readily to treatment with chemical manure.

A Visit to Rockfontein, Ixopo.

A CORRESPONDENT under the pen-name of "Observer" sends the following:—

Last Saturday I paid a visit to Rockfontein, the property of Mr. A. J. Arden, and after a good look round I came to the conclusion that Mr. Arden is amongst the few in the Colony who go in for agriculture upon a large and proper scale, and he is the only person in the Ixopo Division who does so, as I have visited most of the big farms in the district. Rockfontein is a farm of about 3,000 acres, of which nearly 1,500 could be cultivated. It is situated on a high level about one hour's ride from the Umkomaas (Hella Hella Drift), and commands a fine view over the hills and mountains in the Polela and Impendhle Districts. Mr. Arden has been there a little over four years, and when he took possession the place was next door to a wilderness, with a rough

little shanty constructed of wattle and daub, intermingled with rough stones, for a house. Now this has all been done away with and a fine large brick house built. Looking round the grounds (which are kept beautifully clean and neatly laid out) I noticed some three or four very large sheds built of whinstone and iron roofed, nicely floored and splendidly cool, stocked with mealies and all kinds of farm machinery and implements, to say nothing of wagon and carriage sheds, fowl houses, dog houses, and storerooms and outbuildings for the household purposes, large stone kraal, kafir and coolie houses, and piggeries, &c. Mr. Arden possesses some fine dogs, viz., collie, Ayrdale, pointers; fowls, Indian game; pigs (white Yorkshire), a fine troop of cattle. He employs about a dozen coolies and an equal number of natives. On going into the fields I particularly noticed a splendid crop of Algerian forage, almost 2 feet high, in a field of some 50 to 60 acres, all ready for mowing down. The forage was, I must admit, the finest crop I have ever seen, and I have seen a good many in my time, and judging from the present market rates should yield about £250 to £300 to the owner. Further on was a field recently planted with mabele, some 70 or 80 acres, and adjoining this were several large fields being ploughed with three-furrow ploughs, then harrowed and rolled, to be planted with mealies. I should say these fields would cover 300 acres. Mr. Arden informed me the fields are rich and without manure yield from 10 to 15 muids an acre. Coming back I noticed a fine field of early rose potatoes which will be ready by end of November, and a large field from which the winter crop of barley had been taken. This field is right up against the large orchard of special fruit trees of all kinds. From conversation with Mr. Arden I learnt that he gets on well with his coolies, and that he obtains native labour fairly plentiful, and that he employs all the latest and best machinery, which he finds helps considerably in the reduction of labour, and that he is to erect further large sheds and still break up further land for cultivation. It would astonish one to see some of the large boulders (some of which take two full spans of oxen to drag out) taken from the fields. The farm is all well fenced and laid off into paddocks, and is well watered, but Mr. Arden does no irrigation. The veld is perfect, judging from the fat condition of the stock, and the hospitality of mine host and hostess is beyond measure, and Mr. Arden, who has been in the Colony now for 20 years, and has had experiences in Mexico and Peru, is only too delighted to see visitors and show them round, and no doubt take and give many a wrinkle.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc: 37, 1900. For the month of September, 1901.

Date.	Description.	Quantity.	Imported from.	Ship.	Remarks.
1901.					
Sept. 1	Apples (Fresh)	50 cases	Madeira	PembrokeCastle	Free of Pest
„ „	Peach and Apple Trees ...	3 „	Melbourne	Ormidale	Insects present
„ 12	Potatoes (Eating)	1,672 „	Albany	Vine Branch	Free of Pest
„ „	Apples (Fresh)	485 „	Australia	„	„ „
„ „	Apricots & Peaches (sulp'red)	46 „	Sydney	„	„ „
„ „	Apples (Fresh)	950 „	Hobson's Bay	„	„ „
„ 13	Potatoes (Eating)	805 „	Melbourne & Sydney	Nineveh	„ „
„ „	Potatoes (Seed)	1,008 „	Melbourne	Orange Branch	„ „
„ „	Potatoes (Eating)	895 Bags	„	Nineveh	„ „
„ „	„ „	4,577 cases	„	Caithness	„ „
„ 21	Lilies (3)	3 pots	Cape Town	PembrokeCastle	„ „
„ „	Potatoes (Seed)	796 cases	London	Insizwa	„ „
„ „	Apples (Fresh)	50 baskts	Madeira	PembrokeCastle	„ „
„ „	White Jackmanni .. ... (Ornamental Plant)	1 pot	Southampton	Canada	„ „

C. B. JONES, Examining Officer, Agricultural Department.
Custom House, Durban, October 2nd, 1901.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	F. R. Moor ...	Greystone.
		,,	Cooke & Co. ...	Blue Krantz.
		,,	F. Bloy ...	Monte Christo
		,,	J. G. Maritz ...	Vi Plaats.
		,,	F. Knapp ...	Klipfontein.
		,,	G. M. Rudolph ...	Spitzburg.
		,,	J. W. Moor ...	Moorleigh.
		,,	Nqatabaan ...	Moord Spruit.
		,,	J. Oates ...	Oatsvale.
		,,	P. J. Bester ...	Rensburg Spruit.
		,,	R. C. O'Neil ...	Hillgrove.
		,,	C. J. Labuscagne...	Haatsfontein.
		,,	B. J. Wilkes ...	Portington.
		,,	J. G. Hatting ...	Rama.
		,	A. G. Harding ...	Marshlands.
		,,	Du Plessis & Cloete	Compensation.
		,,	J. Van der Merwe	Welgekoose
		,,	A. & C. M Pretorius	Shypoort
J. Button	Estcourt, South of Bushman's River	,	S. Nel ...	Wagon Drift.
		,	C. Cope	The Hoek.
		,,	C. B. Lloyd ...	Hidcote.
		,,	Mrs Lindsay ...	Rosebank.
		,,	Geo. Gibson ...	Craignevin.
		,,	S. C. Boshoff ...	Waterhoek.
		,,	L. Schomann ...	Twyfelfontein.
		,,	S. Schomann ...	Willow Grange.
		,,	C. Groom ...	Springvale.
		,,	W. McFie ...	Highlands.
		,,	J. K H Miller ...	Beacon Hill.
		,,	J. Piccione ...	Greenfields.
		,,	F. Stanley... ...	Nonpariel.
		,,	H. E. Kirby ...	Klipfontein.
		,,	A. G. Stead ...	Allendale
		,,	J. Marais ...	Malan Spruit
A. H. Ball ...	Weenen ...	,,	W. Lotter ...	Doornkloof.
		,,	P Van Rooyen ...	Middleburg.
		,,	C. P. F. Van Rooyen	Mona.
		,,	G. R. Van Rooyen	Victoria.
		,,	P. Lotter ...	Buffelshoek.
		,,	P. M. Lotter ...	Waterfall.
		,,	S. C. Van Rooyen	Middleberg.
		Lungsickness	Mgina... ...	Location
		,,	Maboko	Bushman's River Poort.
J. J. Hodson ...	Lion's River ...	Scab	W. Taylor ...	Fordoun.
		,,	W. T. Shaw ...	Shawswood.
		,,	W. Pepworth ...	Bolesworth.
		,,	Mrs F. McKenzie	Onverwacht.
		,,	W. L. Methley ...	Newstead.
		,,	S. Nurden ...	Wood Farm.
		,,	F. Curry ...	Weltevreden.
		,,	Geo. Woodhouse	Halliwell.
		,,	M. A. Sutton ..	Thorney.
		,,	Jas. Ross ...	Gowrie.
		,,	A. Meugens ...	The Mains.
E. J. B. Hosking ...	Upper Umkomanzi	,,	A. G. Mack ...	Misty Home.
		,,	Mr. Gibson ...	Howard's Hill.
R. J. Raw ..	Impendhle ...	,,	T. Fleming ...	Good Hope.
		,,	J. W. Brooke ...	Impendhle Store.
		,,	G. Renyard ...	Hamilton Hall.

Stock Inspector.	District.	Disease.	Owner.	Farm.
R. J. Raw ...	Impendhle ...	Scab	A. C. Crosse ...	Dingley Dell.
		,,	R. Gresham ...	Castle Howard.
		Lungsickness	C. C. Lewis, and Native ...	Clairmont.
W. Wilson	Polela	Scab	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
		,,	R. Nicholson ...	Lowlands.
		,,	R. C. Gold ...	Woodend.
		,,	R. M. Arbuckle ...	Costmore.
		,,	J. J. Van Dyke ...	Riverport.
		,,	J. Van der Merwe	Nooitgedacht
		,,	S. Maritz ...	Maritzdale.
C. E. Hancock ...	Ixopo ...	,,	R. Kennedy ...	Cornhill.
		,,	A. Watson ...	Rosehill.
		,,	W. Gray ...	Helmsley.
		,,	Natives ...	Langefontein.
		,,	J. Dalgarno ...	Abercairney.
		,,	A. Stone	Craigie Lee.
		,,	W. W. Walton ...	Dronk Vlei.
		,,	P. J. Webb ...	Crystal Manor.
		,,	L. Howes ...	Mornington.
		,,	G. Thompson ...	Cromwell.
		,,	J. Anderson ...	Littledale.
		,,	Est. R. Raw ...	Eastwolds.
		,,	Lulakana ...	Mackenzie's Farm.
J. F. Bernard ..	Newcastle	Lungsickness	P. W. Dept. ...	Newcastle T'Lands
		,,	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		,,	A. Paine ...	Mount Prospect
		,,	Simeon Ndhlovu	Freda.
		,,	C. R. Savory ...	Pomeroy and Evia
		,,	Blizzard & Pratt	Ingogo.
		,,	G. Wood ...	Heron's Court.
		,,	A. F. Henderson...	Brazil.
		,,	Lowrens and Van der Merwe ...	Buffalo River.
		,,	H. Fick ...	Northdown.
		,,	T. L. Möller ...	River Bend.
		,,	Natives ...	Elizabeth Dale.
		,,	J. Masangu ...	Pernambuco.
		,,	Funwayo ...	Tiger Kloof.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	G. W. Nourse ...	Glen Harte & De Weistroom.
		,,	W. Steele ...	Tweefontein.
		,,	— James ...	Newcastle.
		,,	Umketega ...	Vrede.
		,,	A. J. Hurd ...	Tweefontein.
		,,	G. J. Way (Derelict Stock) ...	Vrede.
		,,	Mahakan ...	Kilbarchan.
		,,	Umbetta ...	Freda.
		,,	Maling & Sibibi...	Blauwboshlaagte.
		,,	Umgubana & Mahlogozulu ...	Hope Farm.
		,,	S. W. Reynolds ...	Ramsgate.
		,,	Jack Unguni ...	Blauboshlaagti.
		,,	Umpegelele ...	Kilbarcean.
		,,	S. W. Reynolds ...	Minster.
		,,	Umgodini & Kumalo	Greenwich.
		,,	Umbobojan ...	Valsefontein.
		,,	Mrs. H C. Shorter and Sambana...	Spectacle Spruit.
		,,	J. T. Grant ...	Rooi Pont.
		,,	C. Jackson ...	Yarl.
		,,	H. C. Dicks ...	Minster.
		,,	McMurray & Hurd	Greenwich.

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	Tinta ...	Ballengeiches.
		,,	Verasamy ...	Newcastle.
		,,	Tunziane ...	Blauwboshlaagte.
		,,	J. R. Watt ...	Mains Camp and Bothadale.
		,,	Umkonazi & Pochies	Milton.
		,,	W. L. Oldacre ...	Broadfield.
		,,	Freeman ...	Shakespeare.
		,,	Jim Gama ...	Blauwboschlaagti.
		,,	A. James ...	Kabbaslaagti.
		,,	A. Osborn ...	The Mount.
		,,	Wade & Andrews	Macclesfield.
		,,	A. Vanderplank ...	Eagle's Cliff.
		,,	J. C. Richards ...	Rooi Poat.
		,,	J. Kumalo and Ndhlebe	Massondale.
		,,	Makebla ...	Tiger Kloof.
		,,	Nehorasing ...	Newcastle.
		,,	Indians ...	Bosch Hoek.
		,,	Inkombe ...	Vlak Laagte.
		,,	Sehlurga ...	Blauwboschlaagte.
		,,	Machambu ...	Tiger Kloof.
		,,	Umhlala and Ningazana	,,
		,,	Mgomana ...	Ardrossan.
		,,	Jusveer ...	Lennoxton.
		,,	Petrus ...	The Reserve.
		,,	J. W. Goodwill ...	Cornwall.
		,,	Samiella ...	Duck Ponds.
		,,	Gizana ...	Buffalo River.
		,,	Sowan Umkondo Skibells ...	Parksville.
		,,	Natives ...	Milne Dale.
		,,	Quehlele	Lauriston.
		,,	Newcastle Corporation ...	Newcastle.
		,,	J. R. King ...	Yarl.
		,,	Mrs. Eicke ...	Angora Hill.
		Scab	G. Star ...	Duck Ponde
		,,	C. G. Palmer ...	Dry Cut.
		,,	J. Davidson ...	Lennoxton.
		,,	G. Wood ...	Heron's Court.
		,,	A. D. Uys ...	Horn River and Mooi Krantz.
		,,	T. Ferrier ...	Henley.
		,,	G. Jackson ...	Try Again.
		,,	W. Richards ...	Tweefontein.
		,,	W. E. Few ...	Erin & Imbezana.
		,,	Blizzard ...	Ingogo.
		,,	W. Short ...	Potter's Hill.
		,,	J. Matthews ...	Shakespeare.
		,,	G. Brown ...	Wykom.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	R. S. Armitage ...	Boschhoek.
		,,	H. P. Beare ...	Harte River.
		,,	— Wood ...	,,
		,,	Jim Smith ...	Lennoxton.
		,,	S. W. Reynolds ...	Minster & Ramsgate
		,,	N. H. Fick ...	Wykom.
		,,	A. Vanderplank ...	Eagle's Cliff.
		,,	W. Nicholson ...	Rooi Poort.
		,,	M. C. Behr ...	Shuttleworth.
		,,	H. Meek ...	Diepe Hooten.
		,,	J. McDonald ...	Yarl.
		,,	John Vos, jun. ...	Belfast & Manning.
		,,	Mrs. John Vos, sen.	Landsend.
		,,	A. G. Robertson ...	Craigholm.
		,,	Con. Watson ...	Bismarck.

Stock Inspector.	District.	Disease.	Owner	Farm.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	Anea & Latcham	Plessis Laager.
		,,	W. Oldfield ...	Ambleton.
		,	Pieterm aritzburg Corporation ...	Sanitary Depôt.
		..	F. Knapp & Nonshlene ..	Polly Shorts.
		Scab	Dickinson Bros. ..	Braeburn.
		,,	Ulukozana ...	Bishopstowe.
		,,	Bobobo and Umbabana	Zwaartkop Location.
J. Chaplin ...	Klip River ...	Lungsickness	A. H. Spring ...	Reserve.
		,,	A. Armstrong ..	Ladysmith T'Lands
		,,	S. Woods ...	,,
		,,	J. Piccione ..	Grobblar's Kloof.
		,,	Natives ..	Putunca's Spruit.
		,,	R. P. Leonard ...	Alexandra
		,	G. Pinkney ...	Kethain Glen.
		,,	J, B. Wessels ...	Beanvale.
		,,	— Petty ...	Modder Spruit.
		,,	W. J. Webb ...	Kleinfontein
		,,	H. E. K. Anderson	Gedula.
		,,	E. F. Gibbens ..	Plaat Berg.
		,,	Natives	Georgina.
		,,	Nondo Gama ...	F. J. Dewaal's farm
		,,	A. Boers, & Native	Marais Vel.
		,,	W. Neizel, & Natives	Roosboom.
		,,	Natives ...	Doornkraal.
		,,	F. N. Nel ...	Catherine.
		,,	Natives ...	Macpherson'a farm.
		,,	Natives .	Roodepoort.
		,,	Natives ...	Reit Kuil.
		,,	A. S. McHattie ...	Wessel's Nek.
		,,	Scomber ...	Kleinfontein.
		,,	Natives ..	Dreifontein.
		,,	Malela ...	Reit Kuil.
		,,	P. W. Dept. ...	L. Smith Tn. Lds.
		,,	Myanga Tigalala...	Umhlumayo.
		,,	T. Wright	Davel's Hoek
		,,	P. Tondo	Weston
		,,	H. Neville	Quagga's Kirk
		,,	M. Shea ...	Ladysmith Town Lands.
		,,	P. Kumalo ...	Roodeport.
		,,	Pepworth & Reid	Reitfontein.
		,,	W. H. Roberts ...	Arcadia.
		,,	F. Mundey ...	Morden.
		,,	J. O. Potterill ...	Doo n Kloof.
		,,	Wetherill Bros. ...	Walker's Hoek.
		,,	— Coventry .	Groote Hoek.
		,,	Cochrane & Illing	Umbulwane.
		,,	— Hazel ...	Roosboom.
		,,	— Field ...	Roodepoort.
		,,	Peddie & Moore ...	Dew Drop.
		,,	A. W. J. Boers ...	Weston.
		,,	M. Shea ...	Bester's Station,
		,,	J. Piccione ...	Nooitgedacht.
		,,	Johannes ...	Roosboom.
		,,	Umlandla ...	Reit Kuil.
		Scab	J H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson .	Walker's Hoek.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	G. Wetherill ...	Walker's Hoek
		,,	A. Krogman ...	Brakfontein.
		,,	M. W. Krogman...	Dreifontein.
		,,	P. Marais ...	,,

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Scab	H. Boers ...	Dew Drop.
		,,	G. Spearman ...	Feir View.
		,,	J. Van Reenen ...	Wessel's Nek.
		,,	A. Boers ...	Marais Vel.
		,,	A. Carbutt & J. Good	Matiwaan's Hoek.
		,,	Sparks Bros. ...	Ladysmith.
		,,	J. de-Waal ...	Blaubank.
		,,	F. J. de-Waal ..	Lombard's Kop.
		,,	G. Innes ...	Eland's Laagte.
		,,	A. J. Taylor ...	Arnot Hill.
		,,	R. Horsley ...	Warrock.
		,,	Dr. Helps ...	Roosboom.
		,,	Corrigel ...	Koolfontein.
		,,	Cockrane & Illing	Dansekraal.
		,,	H. S. Bowers ...	Zaaifontein.
		,,	A. Henderson ...	,,
		,,	A. Henderson ...	Eenvogle Vlei & Elandslaagte.
		,,	G. Ashby	Acol
		,,	W. Wright ...	Colworth.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	H. F. Pearson ...	Everton.
		,,	Muti ...	Infuni M.S.
W. Freer ...	Upper Tugela ...	,,	Janshey & Indabazimbi ...	Acton Homes.
		,,	J. W. Coventry ...	Fair View.
		,,	C. Coventry ...	,,
		,,	H. Murdoch ...	,,
J. R. Cooper ...	Nqutu & Nkandhla Districts, Zululand	,,	A. Barklie ...	Nqutu Hill, Nqutu District.
		,,	Natives ...	Telezi Hill, ,,
		,,	,,	Nqutu Hill, ,,
		,	Umasesa ...	Hlati Spruit, Nqutu District
		,,	Natives	Mangeni, ,,
		,,	H. Fry ...	Mpandhleni, Nkandhla District.
		,,	Hutchinson and Hyslop	Near Magistracy, ,,
		,,	H. Swanfield ...	Qudeni, ,,
		,,	Schonyana ...	Babanangu ,,
		Scab	Messrs Havemann	N'Tingwe.
		,,	W. Calverley ...	Nkandhla District
		,,	Struben, Bottomly and Loxton	,,
		,,	W. Berry ...	,,
		,,	J. Hutchinson ..	,,
G. Gielink ...	Eshowe. ...	Lungsickness	Sibobile ...	Matikulu, Eshowe District.
	Entonjaneni, and Umfolosi Districts, Zululand.	,,	Umhlukwana ...	Umsunduzi, ,,
		,,	A. Garland, ...	Bond's Drift, ,,
		,,	G. Higgs & Co. ...	Umhlatuzi, ,,
		,,	P. W. Labuscagne	,, ,,
		,,	F. McGuire ...	,, ,,
		,,	L. Schultz ...	Near Eshowe. ,,
		,,	Luigie ...	Umfuli, Entonjaneni District.
		,,	L. Kritzinger ...	Osborn. ,,
		,,	R. J. Ortlepp ...	Merino, ,,
		,,	J. Fry ...	Empepala, Eshowe ,,
		,,	James Umtembu	Entumeni, ,, ,,
		,,	J. R. White ...	Schuithoek, Entonjaneni District.
		,,	P. Pretorious ...	St. Andrews, M.S., Eshowe District.
		,,	Volker, Schultz, F. Stockholm	Port Durnford ,,
		,,	W. Magee ...	Umlalazi ,,
		,	J. Henwood ..	Inyoni ,,

Stock Inspector.	District.	Disease.	Owner.	Farm.
G. Gielink ...	Entonjaneni and Umfolosi Districts, Zululand	Lungsickness	G. Müller ...	Duikerhoek, Entonjaneni District.
		,,	F. Buys ...	Barneveld ,,
		,,	Damusa ...	Kemp's Farm, Melmoth ,,
		,,		
		,,	F. A. Ortlepp ...	Saxony ,,
		,,	T. Smith ...	Oakdale ,,
		,,	J. A. Ortlepp ...	Vlakbult ,,
		,,	J. R. White ...	Elizabeth ,,
		,,	T. Cooper ...	,, ,,
		,,	Jas. Howe ...	Lower Tugela, Eshowe District.
		,,	E. W. Lamb ...	Amatikulu ,,
		,,	C. Adams ...	Umlalazi ,,
		,,	F. Dickens ...	,, ,,
		,,	Carlie ...	Imfuli M.S., Entonjaneni District.
		,,	C. J. Van Rooyen	Wansbeck, Entonjaneni District.
		,,	H. A. Liversage ...	Morgeson, Entonjaneni District.
		,,	Umlomo-Umdinwa	Ematikulu, Eshowe District.
		,,	L. Botha ...	,, ,,
		,,	H. Liversage ...	Umlalazi, ,,
		,,	P. Nel ...	Noitegedacht, Entonjaneni District.
		,,	Josiyasi	Umlalazi, Eshowe Division
		,,	J. Vermaak and Muller	Umhlatusi Valley
		,,	Springer	Empangeni, Lower Umfolosi District.
		,,	C. Adams ...	Umhlatusi, Eshowe District.
		Scab	R. J. Ortlepp ...	Merino, Entonjaneni Disttrict.
		,,	S. Maritz ...	Melmoth.
W. W. Dore ...	Portion of Zululand North of White Umfolozi and Umfolozi Rivers	Lungsickness	Dinizulu ...	Hlabisa District.
		,,	Surrendered Boers	,,
		,,	C. Wheelwright ...	Nkonjeni, Mahlabatini District.
		,,	— Van Rooyen ...	,, ,,
		,,	E. Loffler ...	Bulwana, ,,
		,,	Magojala ...	, ,,
		,,	Mapangisa-Zambula	Ingwavuma District.
		,,	Nsicongo-Umkoombuzi	Hlabisa District.
		,,	Nomacamcam-Dada	,,
		,,	Noham-Ukusa ...	,,
		,,	Mahakan-Mangaba	,,
		,,	Mangumsan-Matanta	,,
		,,	Umhoomo-Umcatusa	,,
		,,	Umlogotwa-Buzani	,,
		,,	Gufa-Nsihow ...	,,
		,,	Umhangan-Southwala	Ndwandwe District.
		,,	Nyati-Umlangeni	
		,,	Ngoma-Nquabalana	
		,,	Putama-Makatumi	
		,,	Somcuba-Vuvama	
		,,	Shlomusa-Umcandacanda	
		,,	Mau-Mandula ...	
		,,	Umkupuku-Faku	
		,,	Mabogo-Umgimu	
		,,	Mapaza-Undabuko	
		,,	Mazunyo-Mutcha Impeni	

Stock Inspector.	District.	Disease.	Owner.	Farm.
W. W. Dore ...	Portion of Zululand North of White Umfolozi and Umfolozi Rivers	Lungsickness	J. Crossly ...	Makowe Store.
		,,	T. Reid ...	Nhlwati.
		,,	Wessell & Finetti	Mapangisa, Ingwavuma District.
		,,	Mwzinyankomo, Zambula	Ingwavuma District.
		,,	Umgidtshiman, Putasa	
		,,	Charley ...	
A. Klingenberg ...	Umsinga ...	,,	Ungangaza ...	Pression.
		,,	E. V. L. DuBois ...	Vergelugen.
		,,	H. Müller ...	Vermaak.
A. J. Marshall ...	Dundee ...	,,	Natives ...	Renier.
		,,	Natives ...	Navigation Colliery.
		,,	N. Glutz ...	Swiss Valley.
		,,	C. F. Van Rooyen	Davelsberg.
		,,	H. J. Harris ...	Sterkstroom.
		,,	D. Neumann ..	Waterfall.
		,,	Natives ...	Weltervreda.
		,,	S. N. Robins ...	Dundee.
		,,	N. Glutz ...	Morgenstont.
		,,	Natives ...	Maybole
		,,	Umonto ...	Crown Lands, near Dundee.
		,,	J. F. Johnson ...	Dewaar's Nek.
		,,	Murray & Co. ...	Navigation Collieries
		,,	J. Kemp & Natives	Kelvin
		,,	J. H. Reis ...	Longfontein.
		,,	J. Landman ...	Boschfontein.
		,,	D. C. Pieters ...	Goedekeus.
		,,	A. J. Hurd ...	Waschbank.
		,,	J. A. Naude ...	Dewarsberg.
		,,	Umsombuloko ...	Hatting Dale.
		,,	Umnyesa ...	Klipwe.
		,,	Turton Bros. ...	Hayfield
		,,	H. Schroeder ...	Rosenen
		,,	G. H. Stokes ...	Ruigetfontein
		,,	P. Z. Gouws ...	Kelvin
		,,	E. G. Wohlitz ...	Stille Rust
		,,	— Newby & Native	Carolina
		,,	W. Stein	Flint
		Scab	A. Jansen ...	Sheepridge.
		,,	J. H. Erkland ...	Carolina.
		,,	F. J. deWaal ..	,,
		,,	J. H. Reis ...	Longfontein.
		,,	J. W. Dupreez ...	Jackalsfontein.
		,,	H. J. Hearn ...	Hatting Spruit.
		,,	N. Glutz ...	Swiss Valley.
		,,	C. F. van Rooyen	Davelsberg.
		,,	Maritz & Thornhill	Aletta.
		,,	W. V. Marshall ...	East Lynne.
		,,	P. J. Gouws ...	Uitflucht.
		,,	H. Harris ...	Sterkstroom.
		,,	Murray & Co. ...	Navigation Collieries
		,,	J. J. Uys ...	Verdenk.
		,,	P. H. Swart ...	Hartebeestefontein.
		,,	H. J. Nel ..	Blinkwater & Evansdale.
		,,	A. G. Vincent ...	Craigieburn.
		,,	D. Meumann ..	Waterfall.
		,,	Turnbull & Co. ...	Washbank.
		,,	Peerbhoy ...	Dundee.
		,,	H. J. Hearn ...	Double Kraal.
		,,	Thos. Dewaar ...	Navigation.
		,,	A. B. Daniel ...	Beith.
		,,	H. Kriel ...	,,
		,,	F. Kolbe ...	Langfontein & Staat.
		,,	G. Colbe ...	Zwaartwater & Rest
		,,	R. J. Marshall ...	Cleveland.

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ...	Dundee ...	Scab	G. F. Ferreira ...	Hyle.
		,,	J. Kemp ...	Kelvin.
		,,	J. Campbell ..	Manor Park.
		,,	Marshall Bros. ..	Cleveland.
		,,	J. Meyer ...	Mauchline.
		,,	A. J. Potgieter ...	Dewarsberg.
		,,	Kriel & Daniel ...	Beith
		,,	J. Landman ...	Boschfontein
		,,	H. Davel	Klipsruy
		,,	N. F. Hesom ...	Helena
		,,	E. G. Wohlitz ...	Stille Rust
		,,	J. J. Gregory .	Cotswold
		,,	E. J. Stepney ...	Uitray
		,,	L. Hedder ...	Roadside
W. A. Hutchinson	Alfred ...	,,	W. Stafford ...	Sutherland.
		,,	Nqubu ...	Location.
		,,	Makubana ...	Amaci Location.
		,,	J. S. Payn ...	Furney Hill.
		,,	J. Wessels ...	Sheepwalk.
		,,	G. Whitelaw ...	Deemount.
		,,	Geletu Flentyi ...	Location
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness!	Inkubi and Duli ...	Location
		,,	P. Van der Reit .	The Bend.
		Scab	F. E. Zunckel ...	,,
		,,	A. J. Harding ...	Zwart Kop.
		,,	J. Dryer ...	Culfergie.
		,,	J. M. Wales ...	Farleigh.
G. N. Perfect ...	Umvoti—Eastern Portion	,,	D. Evans	Zuur Laager
A. S. Parkinson ...	New Hanover ...	,,	L. J. Nel ...	Glenboig.
		,,	J. M. Botha	Baviaankrans.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	Ingongoni ...	King's Cliff.
		,,	R Smith ...	Effingham.
			— Thompson ...	Marburg.
		,,	W. Clothier ...	Ultima Thule.

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand have been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office, 23rd October, 1901. M. J. HIME, for P. V. Surgeon.

Meteorological Returns.

Meteorological Observations taken at Private Stations for Month of September, 1901.

STATIONS	TEMPERATURE (In Fahr. Degrees).				RAINFALL (in inches).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1901.	Total for same per'd from July 1st, 1900.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	73·4	57 0	91·2	52·0	7·07	16	1·68	20th	10·26	4·55
Stanger...	77,1	53·9	104·0	49·0	4·52	19	1·25	19th	6·95	4·53
Verulam	77·1	55·7	98·0	49·0	6·00	11	1 84	19th	8·02	4·91
Newcastle	77·2	48·2	88·0	40·0	1·56	9	·47	19th	4 76	1·05
Estcourt	72·5	44·4	92·0	37·0	2·37	9	·60	15th	3·72	2·91
Port Shepstone ...	70·6	59·2	98·0	49·0	10·94	14	3 01	14th	12·86	4·69
Umzinto	79·6	53·1	92·5	45·0	6·77	12	1·75	19th	7·57	5·22
Richmond	70·0	49·6	93·0	43·0	3 20	17	68	19th	4·85	3·55
Maritzburg	74·1	50·0	98·0	43·0	3 16	14	·84	19th	4·77	2·17
Howick...	72·2	46·8	92·0	38·0	3 25	14	94	15th	5 07	2·10
Dundee	74·5	42·0	88 0	34·0	3·31	8	1·44	14th	6 00	...
Weenen	77·0	46·6	95·0	38·0	1·67	6	·60	20th	3·40	1·68
New Hanover	72 9	47·3	95·0	40·0	4·95	14	1 01	18th	7·33	2·81
Hillcrest	68·5	53·2	94·0	45·0	5·95	16	1·53	20th	7·83	...
Mapumulo	76·6	51·8	98·0	46·0	5.31	12	1·77	20th	7·82	3·82
Nongoma	...	...	...	...	3·04	6	·93	20th	5·36	1·85
Qudeni	61·7	43·0	82·0	34 0	6 78	20	1·53	14th	10·76	...
Hlabisa	71·0	55·9	90·0	50·0	6 00	11	1·70	15th	8·20	2·37
Ubombo	70·2	55·9	89·0	48·0	4·71	14	1·82	15th	7·08	1·91
Nqutu	67·5	49·2	90·0	40 0	2·44	9	·72	15th	...	...
South Coast Junction Poin	...	...	. .	...	7·49	15	1·35	11th	11 40	...
	...	...	...	...	5·37	10	1·20	10th	6·99	4·03

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—During the past fortnight the market has been well stocked with every line of produce. Although trade is far from being brisk, nevertheless prices all round have been firm, and producers have been, on the whole, satisfied with prices realised.

Mealies.—On six mornings since our last report mealies have been sold on the market at prices varying between 11s. and 13s. per muid, including sack; 12s. 3d. has been about the average for mealies sold privately.

Forage.—Some very fair samples of Algerian are now offered, and prices have fluctuated between 4s. 1d. (inferior) and 11s., 12s, and 14s. 6d. per 100lbs.

Hay.—Some fair samples disposed of at prices varying between 2s. 6d. and 4s. 3d. per 100lbs.; bedding from 6s. 6d. to 18s. 6d. per load.

Potatoes.—Although new potatoes are now offering, prices still rule high, and as much as 30s. 3d. has been obtained for some samples, while some varieties have been as low as 7s. 6d. and 9s. 9d. per 100lbs.; others have realised from 13s., 15s. 3d., 25s. 9d, 26s. 9d., and the price already quoted per 100lbs.; sweet potatoes from 2s. 6d. to 5s. per sack.

Beans.—From 11s. to 17s. 3d. per 100lbs.

Peas.—14s. per 100lbs.

Tobacco.—Very little offering, the average being about 9d. a lb.

Pumpkins.—From 2s. to 7s 9d. per doz.

Onions.—25s. per 100lbs.

Eggs.—Market well stocked, and prices have ruled between 10d. and 2s. 9d. per doz.

Butter.—There has been a fair quantity of butter offered, but good samples have changed hands at 1s. 8d., 1s. 9d., 1s. 10d, and 2s. 3d. per lb., some brands only realising from 11d. to 1s. 3d., and 1s. 5d. per lb.

Poultry.—Common fowls from 2s. to 4s. 4d. and 6s. each.; ducks from 4s. 6d to 8s. 3d. per pair; turkeys frem 10s. 3d. to 15s. each.

Mabele.—From 4s. 11d. to 10s. per 100lbs.

Fruit.—Only the varieties common at the season of the year offered, viz.: bananas, lemons, oranges, naartjes, pineapples, loquats, and pawpaws.

Vegetables are now coming forward more plentifully, and the tables in the market house are filled with beans, beetroot, cabbages, carrots, celery, lettuce, onions (new), potatoes (new), rhubarb, tomatoes, and turnips.

Sundries.—Bacon from 4d. to 8d. per lb.; mutton from 6d. to 10d. per lb.; pork from 4½d. to 8½d per lb.; beef from 4d. to 10½d. per lb.: rabbits, 2s. 9d. each; sausages, 4d to 6d. per lb.

Wood.—Firewood has been offered freely at prices varying between 3½d. to 1s. 4d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade continues good, and a very satisfactory state of affairs prevails in this respect.

Mealies.—The market keeps the same, and want of export facilities prevents anything like a material rise; in fact, should these disabilities be permanent during the next few months, as seems more than likely, a slump would arise from the sheer weight of stocks held by farmers and speculators. Present prices for Coast mealies run about 11s. 6d. per bag delivered Durban. Good up-country grain is worth 1s. to 1s. 6d. more.

Mabele is offering more freely now, doubtless on account of the weevil, which soon gets into this article. Some good samples lately realised 17s. 6d bag, as against 21s. a fortnight back.

Seed Oats.—There is some inquiry for Algerian and Tartarian. It is sincerely to be hoped that farmers will take courage and plant a little ground during this grand spring.

J. RAW & CO.'S CATTLE SALES.

The montbly stock fairs of the Mooi River Farmers' and the Nottingham Road Farmers' Associations were held as usual at Mooi River and Nottingham Road on the 9th and 16th instants respectively.

There was only a fair quantity of cattle at both fairs, at Mooi River being chiefly slaughter oxen and at Nottingham Road young untrained cattle.

One lot of sheep (a mixed lot) at Mooi River realized 18s. each.

Slaughter oxen realized as follows:—£21 10s., £33, £32 10s.. £21, £23, £18 10s., £18, and £20 per head. Devon bulls, £25, £26 10s., £30 each. Alderney-Shorthorn bull, £30.

At Nottingham Road prices were:—Young untrained oxen, £15, £16, £18 per head, Bull, £15 10s.; cows, £10, £16, heifer, £15; cow and calf, £27 10s.; cows, £13 10s, £16 10s., £18 10s. each; bull calf, £8; heifer calves, £8, £9 10s. each.

On Saturday's markets on the 12th and 19th instant, cattle sold as follows:—Bull, £15; trek oxen, £19 per head; horses, 8 gns. to 13½ gns.; bull calf, £6 2s. 6d.; trek oxen, £16, £18, and £19 10s. per head.

The American trotter is first shod when about six months old, and then only on the hind feet, the shoes being required to give holding for the lightest of protecting "toe boots" or "scalpers." Practically all trotting colts strike their hind feet with their toes in moving at all fast, and the pain is apt to upset them and make them break into a gallop; whence the necessity for "toe boots." The action in front is stimulated by the application of "quarter boots"; these are made of soft leather and are fitted round the coronet of each fore hoof; these quarter boots carry strips of sheet lead on their lower edges; the weight the colt thus has to lift improves his shoulder action and makes him use his fore feet. All four legs are protected by boots or bandages, as the trotting colt is peculiarly liable to brush, overreach, and wound himself.

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AND MINING RECORD.

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CONTENTS.

A New Manure.

BASIC SUPERPHOSPHATE.

By ARCHIBALD PEARCE.

IT is some time since anything strikingly novel in the way of manures has been introduced into the agricultural world; but at a recent meeting of the Society of Chemical Industry a newly patented article was described, which, on account of its probable suitability for many Natal soils, may be worth a few words. The fertiliser in question is called Basic Superphosphate, and it is claimed that it will supersede the ordinary forms of superphosphate on all such soils as are deficient in lime, and have certain other advantages besides. It is made by mixing lime with superphosphate in the process of manufacture, with suitable precautions as to the quality and quantity of the lime, the result being to produce a phosphate of such a nature that the admitted disadvantages of superphosphates on soils poor in lime are counteracted. As we are afflicted with many such soils in Natal the possibility of obtaining a manure specially suited for us is a very desirable object; and the progress of this new invention should be watched by those

who have the interests of agriculture at heart. The new manure is already on the market at Home, and the Scotch agents of the patentees report that they have sold 400 tons, and that it is taking very well.

The drawbacks to the use of superphosphate, which this invention is designed to obviate, are chiefly due to its acidity. Superphosphate is made by acting on mineral phosphate or bones with sulphuric acid, which converts the insoluble phosphate into the monocalcic or soluble variety. It has the advantage of being quick in action, and it very rapidly diffuses through the soil; but these advantages depend largely on the presence of sufficient lime in the soil to combine with the acid phosphate and to neutralise its acidity. If the soil is itself acid, as is often the case with vlei soils and those rich in decomposing vegetable matter, the soluble phosphate remains in that condition, and is liable to be washed out of the soil, which explains the complaint so often heard, that nothing is left after the first year. But even if the soil be not acid, in the absence of lime the phosphate combines with any other base that may be present, usually iron, and takes a form in which its solubility is lost, or at least impaired. There is also a tendency for the use of superphosphate to continually reduce the amount of lime in the soil; and where lime is expensive, as it is in this country, wholesale liming is too costly to be practicable. In addition to this, there is always a danger in the use of acid manures on lime-free soils, that the nitrifying organisms, on which so much of the fertility of land depends, work only with difficulty, or not at all, in the presence of acid; and thus the crop is deprived of its proper amount of nitrogenous nourishment.

While, then, on suitable soils, the ordinary form of superphosphate (and most mixed or special manures have this for their chief ingredient) is capable of doing excellent service, it has been the rule, on soils deficient in lime, to use alkaline or neutral manures, as bone dust, basic slag, guano, etc. These have all shown good results, but are inferior to superphosphate in quickness of action. The new product is designed to remedy this inferiority and to produce a manure nearly or quite as rapid as superphosphate, and without its disadvantages, the idea being to imitate before application what takes place after application in a soil with a fair percentage of lime in its composition. A somewhat similar product was formerly made, known as precipitated phosphate, but its manufacture has, I believe, been discontinued on the score of expense; the new product is claimed to be much cheaper. The same end has also been aimed at in a rougher way by making a compost of bone dust and superphosphate, and allowing it to ferment for a few weeks; also by mixing superphosphate and basic slag. The latter mixture I have been roundly blamed for advocating; but I still believe in it, and a correspondent lately reports good results from its use.

I hope the manure manufacturers will take the invention up, and that the product may be before long available for trial. Its success here depends largely on the price at which it is placed on the market; it would probably need using as freely, or nearly so as basic slag; but its superior quickness should compensate for a slight difference in price.

Rinderpest at Van Reenen's.

ON the 28th ult., the Minister of Agriculture received a report that rinderpest had broken out amongst native cattle on the farm Doornhoek, Sandspruit, under Van Reenen's Pass. Mr. H. Watkins-Pitchford, Director Veterinary Department, was at Van Reenen's at the time, and he immediately proceeded to the scene of the outbreak; after investigation, he declared the disease to be undoubtedly rinderpest. Mr. Woollatt, P.V.S., proceeded to the spot, and inoculated the cattle. The cattle were promptly isolated, and every precaution was taken. The outbreak is on the slopes of the Berg. It is possible that the infection may have been caused by cattle which had strayed from the

O.R.C., or by cattle which had been stolen by natives and brought into the Colony. Under a recent proclamation the O.R.C. border is closed against the introduction of horned cattle into Natal, but, owing to the state of the country, it has been impossible to guard the border. There were 150 head of cattle in the infected troop, and on the 29th these were inoculated with bile obtained locally. The in-contact cattle, numbering 400 head, were segregated and inoculated with bile. All the cattle are carefully guarded within a defined area, surrounded by a zone of about three or four miles in depth, which is kept clear of all cattle.

Another outbreak has occurred at Tintwa, on the farm Schoon's Spruit. On the 20th October a suspicious case was reported, and on investigation the dead beast was found to have been entirely disposed of by the natives. The remaining 48 head at this kraal were all healthy. The cattle, however, as being suspicious, were isolated. On the 28th October a beast developed symptoms of rinderpest. There were no immediate in-contact cases in this instance.

Up to date (7th November) 24 head of cattle have died from the disease since inoculation. No disease has appeared in the in-contact herds. The disease apparently is not so virulent in character as during the last epidemic. In a few days the in-contact cattle should be immune for the time being.

Notice.

THE Editor has much satisfaction in stating that Mr. Archibald Pearce, Hilton, has consented to write for the *Journal* a series of articles on "Elementary Agricultural Chemistry." The first will appear in the next issue. Although the articles are written chiefly for the benefit of the younger readers of the *Journal*, the information given will prove acceptable to the majority of those of older years. Mr. Pearce aims at simplicity of style, and at making every step from the very foundation clear. If those who read these articles will read them *thoughtfully*, and make absolutely sure, step by step, of their own ground work the succeeding and more intrinsically interesting articles will present no difficulties. Mr. Pearce is a keen, practical student of agricultural chemistry, and perhaps, what is most to the point, he is skilled in imparting knowledge to others. With the rapid changes in the style of colonial farming and the increased value in land, an elementary knowledge of chemistry as applied to agriculture is becoming indispensable.

Veterinary Staff Notice.

MR. H. WATKINS - PITCHFORD, F.R.C.V.S., is appointed Government Bacteriologist and Director of the Veterinary Department.

Mr. S. B. Woollatt, M.R.C.V.S., is appointed Principal Veterinary Surgeon.

Richmond Road and Camperdown Farmers' Association.

THE Annual Meeting of this Association was held on the 1st instant. The President, Mr. T. Stead, in the course of his report said as follows :—

As you are aware, the past year has had its drawbacks, and has not been a profitable one to many of us owing chiefly to the severe drought. The planting season for the majority of the crops was greatly curtailed, the consequence being that a smaller area than usual was planted, the mealie crops with many of us not harvesting more than half our usual quantity.

The potato crop, notwithstanding the careful selection of seeds and manures, has suffered more from the blight than usual. In fact, I might say the crop has been a complete failure with most of us,

and when we take into account the high price of imported seed, and heavy cost of fertilisers, it means a serious loss. I should like those men who have tried the spraying process to give us their results.

The Forage Crop.—There were not many farmers who planted Cape forage in our District this season, being disheartened by the crops having gone off with the rust for the last three years. The Algerian oats to some extent were tried with success in some Districts. The difficulty seems to be to find the right time to sow it. One thing is certain, it requires far more rain than the Cape oat, and, in my opinion, should not be sown later than the middle of January. I am glad to be able to give a favourable report of the Mapstonian rust-resisting oat, supplied by Government last season in 50lb. lots to members of associations and others. The results are gratifying, inasmuch as it is proved that the forage is what it claims to be (rust-resisting). Mr. H. Baker sowed 50lbs. of this oat, and the crop produced was 700lbs. of oats, and 4,000lbs. of straw, without irrigation. I have good accounts from other farmers—describing the straw without a particle of rust, and standing from 4 to 5 feet high, and heavily corned. I hope every care will be taken of this valuable seed, and that it will spread through the Colony as rapidly as possible.

Agriculture is making rapid strides; on every side we see steady progress; the best of implements are used, manures and seeds are imported in quantities, poor ground is consequently yielding good crops. One Association this season imported 200 tons of bone-meal, 131 tons of basic slag, 31 tons of dissolved bones, 3 tons of guano, and 377 boxes of seed potatoes.

Creameries, I believe, are flourishing, and have proved financially successful. The demand for milk is rapidly increasing. Mr. Baynes has had to take out the old plant and put in larger. I am informed that when the new plant is in the capacity of this creamery will be the largest in the world.

Locusts.

MR. STOCK INSPECTOR BROWN reported on the 31st of last month:—Only one small swarm of locusts passed here, on the 30th of October, in the direction of Mapumulo District. I have been informed that a large swarm was seen on the 26th October, Lower Mfolozi, making in the direction of St. Lucia Bay. We have been having splendid rains for this month—in fact, too much. Everything is promising for a good season.

District Reports.

DUNDEE, 30th October.—The rainfall during this month has been very heavy, and has done a lot of good to the crops. We have had a few hot days, but the weather is, I am told, very cool for this time of the year. The natives stongly object to work, and a number have refused to go to Pretoria as policemen at a wage of £3 a month, food and uniform. There is a craze among them for attending beer drinks outside the township, and I am taking stringent measures to suppress this evil. Cattle stealing does not decrease, and crime generally among natives seems to be on the increase. This I attribute to the high wages paid by the military, which enables them to obtain liquor from Cape boys and Indians. Chief Sandaneswe has just asked for leave to go to Pietermaritzburg to see the Secretary for Native Affairs, and hand over £40 which he has collected for the sick soldiers. Cattle sickness is not so prevalent, but there are a few cases of horsesickness in the neighbourhood. Coal is very expensive in Dundee, which seems surprising, being so near the mines.

W. G. WHEELWRIGHT, Magistrate.

HARDING, 4th November.—Splendid rains have fallen during the last month, and ploughing is in full swing everywhere. All kinds of stock are picking up. I regret to say that an outbreak of lungsickness was reported last night on Mr. Simpson's farm near the Ingeli; the stock inspector has not yet seen the cattle, so I cannot say for certain if it really is lungsickness. There has been a doubt whether rinderpest existed in Pondoland; the general opinion was that it was gallsickness, but I heard from the Resident Magistrate, Bizana, Pondoland, that it had broken out. Natives have reported that locusts are attacking the young mealies in the lower part of the District.

P. W. SHEPSTONE, Magistrate.

INANDA, 29th October.—I have very little of interest to report this time. The season has continued most favourable; crops are coming on splendidly all over the Division, and all the sugar mills are hard at work crushing a splendid crop of cane. Given a continuance of the favourable weather which has been experienced

during the past twelve months, next season's output of sugar should—in fact, will be the heaviest ever gathered in Natal. Fruit of every description, grown on the Coast, is coming on well, though, with the exception of mangoes, the crops will not be so heavy as last season's. Last year's mango crop was a light one, which accounts for the heavy one now coming on. Mealies in many places are a foot high and looking well, and the coolie farmers are very busy getting in all the land they can The weather has, however, been so favourable to the growth of weeds, that they are experiencing some difficulty in dealing with them; and there have been a good many desertions from service owing to coolies offering higher wages to procure labour to deal with the weeds. I have not seen any locusts since writing my last notes, nor have I heard of any. I hope this is a sign that we are reaching the end of that plague. Stock of all kinds is looking well, and I am glad to be able to report that the Division is at present clear of disease; nor have there been any cases of horse-sickness yet. The following are a few of the meteorological observations made in Verulam during September, 1901:—Maximum temperature in the shade 98 degs. on the 7th, which is the highest this summer; minimum, 49 degs., on the 22nd; mean for the month, 65·4 degs Rainfall, 6·00 inches, which fell on 10 days, the heaviest fall being 1·84 inches on the 19th. With the exception of the 7th September we have had no hot weather this summer, the season having been characterised by successive cloudy days and cool temperature, sometimes so cold as to necessitate overcoats. The new epidemic amongst dogs, which I referred to some time ago, still continues, and I believe has carried off nearly half the dogs in the Division, and will no doubt be reflected in a considerable reduction in dog tax next year. The average yield of this tax for the Division has hitherto been £600 per annum, representing 2,400 dogs. Coolies are the largest owners, and as they appear to be very fond of their dogs will no doubt not be long in replacing their losses.

JOHN L. KNIGHT, Magistrate.

NEW HANOVER, 4th November.—The rainfall during the month of October was 3·28 inches. Quite a record for the corresponding month of the last few years. Locusts have not been seen here for months past. The majority of horses bought by farmers from the military authorities have died, very few of them being strong enough to stand the sudden change of climate after the privations they were first put to. The few surviving ones are only just beginning to pick up in condition although they have been in the District for several months.

A. RITTER, Magistrate.

NQUTU, 31st October.—The weather having proved so favourable during the month, full advantage has been taken of it to cultivate the land, and ploughing and planting has been freely indulged in. I fear that the area of land being cultivated will, however, fall a deal short of last year's, as so many oxen have been looted by the Boers since last season, and the natives of this District rely chiefly on the plough. Rain fell on ten days during the month, giving a record of 2·52 inches. The weather was otherwise most pleasant throughout, and there was an absence of heavy winds and excessive heat. The country is looking green and cheerful, and grazing is excellent and abundant. Stock are in fine condition, but I regret to say that there have been several fresh outbreaks of lungsickness amongst native cattle.

C. HIGNETT, Magistrate.

UMLALAZI, 3rd November.—Spring has given place to summer, which has now fairly set in here, bringing with it the hot north winds, with their too frequent accompaniments, to wit, swarms of locusts. A large swarm of these pests passed over the Magistracy on the 28th ultimo, travelling from the north-east to the west. On the 1st instant a second swarm, coming from the same direction, settled here, and has not yet left us; the young mealie crops in this neighbourhood are, in consequence, suffering considerable damage. Another dense swarm has just alighted on the forest skirting the beach two miles north of the Umlalazi River. The natives have been very energetic in their agricultural operations for some time past, and the present prospect of losing the reward of their labour is a very disappointing one. I noticed a garden of mealies a few days ago in full flower, with cobs forming; but the average height of the plants now is about 12 inches. Rain fell on 14 days during last month, totalling 5·52 inches, the heaviest fall being 1·66 inches on the 24th. Only one fresh outbreak of lungsickness has been reported since my last report to this *Journal*, which may be regarded as a favourable sign. Unfortunately, however, there there is still a good deal of this disease in the Division. A depot for clean cattle is being established by the Government on the Tugela River bank, on the Zululand border, in this District, for the purpose of placing cattle prior to their being allowed to leave the infected area, which, I believe, now comprises the whole Province of Zululand. A quarantine station has also been established near the Inyoni River, also in this District, in which the transport oxen used by the military authorities here will be placed for a certain period after being released by the military before being handed back to their owners. The lepers location has now been surveyed, and comprises some 7,000 acres of land, situated between the Matikulu and Inyoni Rivers in this District, and extending down to the sea beach. All the natives living on that land have now been removed from it, and have been placed well outside of the boundary. Whilst at the location in connection with this duty, my attention was drawn to the remarkably fine sweet potatoes grown there, which were certainly the largest I have seen anywhere. The natives have also cultivated small patches of cane, which appeared to be very flourishing, and well adapted to the soil there.

J. J. JACKSON, Magistrate.

WEENEN, 1st November.—After another spell of dry weather, including several extremely hot days, enlivened by strong winds and dust storms, we have been refreshed by another downfall of rain on the 29th and 30th of October, registering over half an inch, and bringing the rainfall for the month up to 1·87. Lungsickness, in no serious form, still exists in the Division, the infected area being a portion of the farm Bushman's River Poort. The native who owns the affected herd failed to report the outbreak of the disease, and has been duly punished for his neglect. The forage crop on the Settlement is now being reaped. With the exception of Mr. Barron's fields, which have been heavily attacked, most of it has escaped the rust. Local farmers have been experimenting with Algerian oats this year with varying success. Though not exempt from the disease, this species appears to have withstood the rust better than either Cape or Sidonian. Mealie planting by Europeans and Natives is proceeding apace. The heavy crops reaped last year by natives have brought about a condition of greater prosperity among the black population of this District than has been enjoyed by them for some years—unfortunately resulting in a corresponding scarcity of labour.

C. G. JACKSON, Acting Magistrate.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 4th December next :—

Ladysmith.—On Mr. J. Thorrald's farm The Moorings, Sunday's River—Grey mare, 14 to 15 hands high, looks aged, in poor condition, broad leather strap round neck. Small grey mare, fair condition, may be foal of above. Small brown mare, between two and three years old, in fair condition. All the above have long uncut tails. Red cow, branded on right hip PV, half tail, both ears marked swallow tail, probably six years old. Black ox, white belly and fore legs, half of face and throat white, about two years old, end cut off left ear, branded on right hip broad arrow. Black heifer, both ears marked, no brands visible, about two years old.

Ndwedwe.—Grey gelding, about 14·2, aged, flea-bitten, recently clipped, branded with crows foot on near hind quarter, narrow head. Said to belong to Arab at Verulam, who, however, disclaims it.

Estcourt.—On the farm Slievyre, of A. E. Haviland, black 2-year-old heifer, with white on flanks, slit in right ear, bit off tip of left ear, and also a bit out of the left at base, brand indescribable.

Colenso.—On the 17th October, 1901, black bull, white dewlap, both ears slit, about six years old, branded AO on right hip, probable value about £5. Will be sold one month from date unless previously released.

Dronk Vlei.—24th October, 1901, grey pony stallion, about six years old, height about 13·2, lame left hip, switch tail, probable value £4. Will be sold one month from date unless previously released.

The stock impounded as hereunder will be sold, unless previously released, on the 18th December next :—

Howick.—Red cow, white brush, indistinct brand on left hip, three blind teats. Red heifer calf, white brush.

Thorny Bush.—Black ox, branded EA on left buttock. Impounded 14th October, 1901.

Acton Homes.—Grey mare, long mane and tail, branded on right leg BV. Bay filly, about two years old, foal of the above. Dark-brown mare mule, branded on right leg BC.

Greytown.—On the farm Bobjaan Krantz, Mr. P. M. Botha, black ox, branded Œ indistinctly, age about five years. On the farm Elendale, Mr. E. Stadler, grey mare, no brands or marks, with riem round neck.

Impendhle.—On the farm Silverstream, Mr. J. W. Taylor, red ox, with white patch on face and belly, both ears notched, four years old, branded WN on near hind leg.

Howick.—Bay mare, black points, over 15 hands, branded on left hip like HK.

Ndwedwe.—Mouse-coloured mare mule, branded, looks like CK, on near hind quarter, and looks like W on off hind quarter, wearing headstall. Mouse-coloured mule gelding, branded, looks like CL on off hind quarter.

Impendhle.—On the farm Rocky Lodge, Mr. W. Wood, black bull, with white spot on belly, two years old, no brands or marks, horns straight from head. Probable value about £5. The above bull wil be sold one month from date unless previously released.

Tunis Sheep.

A BREED FOR CROSSING.

OF late years accounts have appeared from time to time in the American stock journals on the suitability of the Tunis sheep for crossing purposes, and their adaptability to conditions where breeds other than the merino would fail. In Australia the merino has for such a length of time held sway far above other sheep breeds that the introduction of a foreign type is looked upon with mistrust, and the Australian sheep-breeder is, as a rule, very conservative. He certainly has the right to be so, for the merino has contributed the bulk of the foundation on which the present high status of the Commonwealth has been built. There are, however, places in Australia where the merino does not thrive, but which are suitable for some of the English breeds. After years of trial, the Lincoln, Leicester (both English and Border), Romney Marsh, and Cotswold, belonging to the long-woolled tribe; and the Shropshire, Southdown, Hampshire, and Oxford Down, of the short-woolled tribe, have found most favour. All these breeds have been crossed and re-crossed to a large extent, and now the mutton-raiser knows fairly well what will suit his customers at home and abroad. He is thus loath to try a new breed unless he has sufficient evidence that it is a profitable animal, which at present he has not. The Tunis sheep is a mountain or semi-mountain breed, about the size of the Dorset. They have the recommendations that they can withstand the heat of a warm climate, will breed at almost any season, have very early maturing qualities, are active foragers, and will consume a great variety of plants. An authority on these sheep says :—"It is claimed for them that the carcase dresses profitable on the block. The quality of the meat is said to be of the very best. The fat is blended with the lean, rather than laid on externally and internally, whilst the flavour of the meat has been highly praised. When crossed upon the various Down breeds they put their stamp upon the progeny; thus showing their great prepotency. The cross upon the merino, pure or graded, is said to improve mutton qualities." Like the Dosets, Tunis sheep are prolific. They not only produce many couplets, but in some instances they breed twice a year. The wool is not very dissimilar to that of the Dorset in quantity and quality. They shear an average of about 7½lb. greasy wool. Since they can stand the heat well, they should suit the merino for crossing with, but only for the purpose of producing a marketable mutton.—"Jamaica Journal of Agriculture."

Laura, the dam of Petrarch, Fraulein, and other good horses, having broken a blood-vessel at exercise, was sold for £25 to a Midhurst miller. She bred him thirteen or fourteen foals, five of which, including the two above named, were good ones. Petrarch was sold to Lord Dupplin for £10,000, and Mr. Stirling Crawfurd paid £3,500 or £4,000 for Fraulein.

The first horses imported into America wer taken over by Columbus on his second voyage in 1493. Thirty years later forty-two horses were landed in Florida, but they all died soon after their arrival. De Soto, who made an expedition to the New World in 1540-41, left a number of fine Spanish horses behind him when obliged to quit the country after his conquest of Louisiana, and this stock is thought to have formed the foundation of the wild horse of the south-western States. In 1604 a French immigrant brought to Acadia a number of animals from which the modern Canadian pony is thought to be descended. Horses from Flanders were imported into New York in 1625.

In a notice of the Bodalla dairy farm, in the New South Wales South Coast district, the Sydney *Stock and Station Journal* reports that the Bodalla herd numbers 630 milking cows, consisting of 110 Holsteins (a comparatively recent importation from North Germany), 160 Ayrshires, 150 Shorthorns, 130 "grades," and 80 Jerseys. The 110 Holsteins yielded last year 61,269 galls. of milk, being 554·8 galls. per cow; the 130 "grades" gave 67,499 galls., being 519·22 for each cow; the 150 Shorthorns, 77,168 galls, or 514·46 galls. per head; the 160 Ayrshires, 72,446 galls., or 432·8 galls. each; and the 80 Jerseys, 28,845 galls, equalling 350·66 galls. each

Cold Storage Profits.

THE S.A. Cold Storage Co. during the year ended June 30th made net profits amounting to over a million pounds sterling. The company's reserve fund stands at £1,000,000. Dividends at the rate of 55 per cent. per annum have been paid during the year, besides a bonus of 10s. per share, and £44,463 5s. 1d. has been carried forward.

Pasturised Milk for Calves.

THE manager of a well-known Central dairy thus writes to the "Queensland Country Life," respecting the above :— During the 17 months since the opening of our creamery we have had some 200 milk suppliers on our books. This summer we were receiving about 1,500 gallons of milk daily, a large portion of which supply still continues. During that time, although there were complaints in neighbouring creameries of sickness and death among calves, attributed to separated milk, with us there was not one complaint of a calf even being sick from our pasteurised milk, our calves being as good as or better than under the old system. During one fortnight, however, when we could not pasteurise owing to improvements being in progress in our machinery, many complaints were made of scour among our calves ; so much so that our suppliers threatened a revolt unless we at once resumed pasteurising. Our separated milk has also proved an excellent food for pigs. Separated milk, if pasteurised, is superior as food to the old buttermilk, formerly the main food of calves in Ulster ; for, although 10 gallons of separated pasteurised milk will contain about half a pound less butter-fat than the same quantity of buttermilk, it will contain 4½lb. of sugar, which in the buttermilk will have been destroyed as food, having been converted by the bacteria into lactic acid containing nourishment, whereas sugar is a valuable food for young animals or even adults, as is shown by its being the main article of diet among the West Indian native. Our separated milk is used by our people of all classes as an article of food, and is preferred by many to the old buttermilk. Pasteurisation is the best preventive known for the spread of infection by any dairy product, so that the public will be greatly benefited by its becoming general. In Denmark the "pasteurising law" obliges every spoonful of creamery milk to be pasteurised, even if fed to pigs.

The popularity of citrus fruits is increasing year by year in the most regular manner in England. Ten years ago the value of the imported oranges and lemons came to £1,756,852. In 1895 it was £2,476,510, whilst last year it reached a very high point, representing £2,635,471. This total has never been exceeded in the whole history of the trade, with the exception of the year 1897, when the value was £2,677,070, the result of an extra plentiful crop.

Cardinal Wolsey, who occupied Hampton Court, did not breed horses, but he kept a considerable stable retinue and stud. He had a master of the horse, a clerk of the stable, a yeoman of the stable, a saddler, farrier, yeoman of the chariot, sumpter man to look after pack animals, a yeoman of the stirrup, a muleteer, and sixteen grooms ; the number of helpers does not appear. He kept a hundred horses and mules for his own household, escort and carts, and there were "six horses to wait on my Lord at Hampton Court and other places, and six grey and white ambling mules for my Lord's own saddle."

Annual Dairy Report.

By E. O. CHALLIS, Dairy Expert.

PART II.

CREAMERIES.

SUFFICIENT time has now elapsed, since the two Creameries in the Colony first started operations, to form some idea as to whether they are successful and are likely to be successful in the future.

I think it can be confidently stated that both Creameries are decidedly a success, and I see no reason why they should not be even more so in future years. The Natal Co-operative Creamery is to be congratulated on being able, in its first year's working, to declare a 7 per cent. dividend, and also, in addition to this, to offer a bonus to all suppliers of milk and cream. Few companies are able to do this on their first year's output; but it must be remembered that the Natal Creamery had an abnormal year on account of the large supplies the military hospitals required, the very keen demand for Dairy Products, and the exceptionally high prices paid. Of course this abnormal demand for Dairy Produce, and the somewhat fictitious prices paid cannot go on for ever, and the future management of the Creamery will therefore require the careful attention of the Directors, and every effort will have to be made to largely increase the Creamery's output, and thus appreciably reduce the working expenses.

It has been found necessary at both Creameries to considerably increase the existing machinery and Dairy plant, and the Directors of the Natal Creamery have also decided to add largely to their present building.

This necessity for increased machinery, etc., I look upon as a very healthy sign, as it shows that the outputs of both Creameries are on the increase, larger and more powerful machinery having to be obtained to deal with the increased work.

I have heard a good deal of criticism expressed, both directly and indirectly, to the effect that the machinery and Dairy plant at the Natal Creamery was not satifactory, also as to why I had not advised the Directors in the initial stage to put in a more powerful plant, and erect a building sufficiently large to meet all contingencies. As far as the building is concerned I did advise the erection of one with larger dimensions, as can be proved by the original plans of the architects. But at the time when this Creamery movement first started, there was so much scepticism amongst the farmers as to its ultimate success that it was found very difficult to secure sufficient capital to start operations. This being so, the original plan of the Creamery had to be altered, and the dimensions of the rooms considerably reduced in order that the somewhat limited capital at the disposal of the Directors might not be exceeded.

With regard to the Dairy plant and machinery, it must not be forgotten that when the Natal Creamery first started operations, it was intended only to purchase cream from the farmers and convert the same into butter, and I can confidently state, without fear of contradiction, that the existing machinery and plant are perfectly capable of dealing with all the cream that can possibly be collected and brought there to be dealt with. But very soon after the Creamery started working, it was found, through the presence of the military, that a large demand for fresh milk was created, and naturally the Creamery took advantage of this demand and undertook to supply the military hospitals with milk. As the demands for milk increased, so the suppliers of milk to the Creamery increased, and the directors had to deal with the problem of how they were to utilize the present building and machinery in treating three or four hundred gallons of milk per day. To tackle this problem, the first step to be taken was to procure an up-to-date Pasteurizing plant. This having been done, it was soon apparent that the available steam and refrigerating power at the disposal of the Creamery was inadequate to cope with the extra strain put upon it. It is a well-known fact that, when three

or four hundred gallons of milk per day have to be treated, with the possibility of this amount being doubled, a large allowance has to be made when calculating out what amount of steam and refrigerating power would be required for the purpose. As no such allowance was made in the machinery ordered for the Natal Creamery, it was, of course, to be expected that the Directors would find that, in order to cope with an increasing business, they must enlarge their premises and largely increase their steam and refrigerating power. It is satifactory to know that these necessary alterations are about to be made ; and it is to be hoped, with the experience of the past and also with the knowledge now acquired as to what the possibilities in the future in the shape of supplies are likely to be, that the new machinery will be sufficiently powerful to deal with any contingency that is likely to arise. In regard to the Dairy plant, it is a difficult matter to decide which articles are the most suitable kinds to procure, as nearly every other man competent to give an opinion will tell you something different, one liking this kind of churn and another that kind of worker, until you are led to order what you think best from your own practical experience. But the fact remains that the Dairy plant at the Nel's Rust Creamery, which is almost identical with that in use at the Natal Creamery, has given every satisfaction, so much so that in all probability it will be duplicated to cope with an increasing business.

I hope, that in the future, both Creameries will receive more support from the farmers than they have done in the past, as I think sufficient proof is forthcoming to show that it is better for farmers to co-operate rather than to work on an individual basis. It is also as well for farmers to remember that the working expenses at any Creamery are governed by the amount of supplies received, and in order to reduce the working expenses at both Creameries to a satisfactory basis, it would be necessary to double the supplies at present received. There is also another point in which farmers could very materially help in placing this Creamery question beyond the possibility of failure, and that is in being very careful to deliver their raw material, viz., cream and milk, in as sound a condition as possible. There seems to be a prevailing idea amongst suppliers that so long as the cream or milk reaches the Creamery, no matter in what condition it arrives, the Creamery will do the rest, having refrigeration and modern appliances to work with. This, of course, is quite an erroneous idea, as no amount of skill, even when backed up by scientific knowledge and modern appliances, can possibly produce a first-class article out of raw material that arrives in a tainted and decomposed state. This being the case, it is to be hoped that suppliers will do all that lies in their power to deliver to both Creameries either cream or milk in as perfect a condition as possible. Such a condition, in the case of milk, can only be brought about by paying strict attention to the cleanliness of the milking, keeping all milk cans and pails sweet and clean, and removing all sediment and dirt through proper straining, and by the thorough cooling and aeration of the milk. The majority of farmers in Natal are familiar with the use of milk aerators, or refrigerators, as they are sometimes called, and understand the principles of cooling and aerating milk ; but a great many of the suppliers little realize the bearing such treatment has on the keeping qualities of the milk. I have often noticed, on opening up cans of milk at one of the Creameries, that the milk has a warm tainted smell ; and it is at once apparent that such milk has not been aerated or cooled, and has been, in many instances, badly strained and carelessly handled. When warm milk is brought in from the kraal, and is immediately placed in milk cans with close-fitting lids, such milk usually arrives at its destination in a more or less tainted condition, or, if not actually tainted, its keeping qualities are greatly impaired. There is also rather a tendency amongst suppliers of milk to think that, as long as milk is placed in a cold room and kept at a low temperature, all taints are by this treatment removed and the keeping qualities considerably improved. But this is not the case, for unless the gaseous or " cowy " odours in the milk are first removed by aeration, they simply become consolidated by reducing them to a low temperature, and this refrigerated milk, when it is delivered to the consumer, comes in contact with a warm atmosphere

and the consolidated gases expand and give off an offensive odour, and such milk usually sours very rapidly. But, as I have already pointed out, all this can be avoided by proper aeration and strict adherence to absolute cleanliness. It will also be as well to remember that all aeration of milk must be done in as pure an atmosphere as possible. This is obvious, for when milk is exposed in a thin film (as it would be in passing over an aerator), the whole of the milk comes in contact with the air, and if that air is vitiated, that benefit derived from aeration is, to a great extent, depreciated.

In the treatment of cream, directly it comes from the separator, aeration would prove most beneficial, but up to the present I have not been able to secure a suitable cream aerator for farm use.

As I hope before long to be visiting America and other leading Dairy centres, I hope to meet with something suitable for the use of Natal farmers.

At the same time I have no hesitation in stating that a good percentage of the cream delivered to the Creameries could arrive there in better condition, even during the hot weather, if proper attention were paid to details, more supervision given to the black labour employed, and, above all things, strict cleanliness, which, in my opinion, is the secret of success in all Dairy work.

Another point in connection with the Creameries is the opening up of a Model Dairy Agency in Durban, through which both Creameries should be able to find a ready market for their products. That this is a step in the right direction there can be no doubt, and given efficient management with abundant suppliers, this new venture should be a decided success. As this Dairy Agency has only recently started, it would be premature at this stage to pass any definite opinion as to what its success in the future will be, but I hope that such an enterprising scheme will meet with the success it so fully deserves.

The Importation of Dairy Produce.

The following figures give the different amounts of Dairy Products imported into the Colony during the years 1899 and 1900 :—

	1899.		1900.	
	Quantity. lbs.	Value. £	Quantity. lbs.	Value. £
Butter	1,609,177	67,684	2,253,829	105,136
Margarine	136,870	2,941	265,868	5,562
Cheese	899,923	22,245	1,120,931	30,525

On examining the above returns, the importations of 1900 show a somewhat alarming increase over those for 1899. This, I think, is due almost entirely to the war, and also to the fact that in the up-country districts, through the presence of the Boers, farms were left deserted, a large number of stock looted, and practically for about a year and a half hardly any butter or cheese was made. There is also another point which has to be taken into consideration, and that is the demand that has been created during the past two years for the sale of Pasteurized milk.

Approximately during the years 1899 and 1900, 310,563 galls. of milk have been sent to the towns and military hospitals, and if the above quantity of milk had been converted into butter, it would have produced 124,225·2 lbs., assuming, as a fair average for Natal, that it takes 2½ gallons of milk to produce 1 lb. of butter. Had, therefore, this amount of milk been converted into butter, as it would have been before the war broke out, considerable reductions would have to be made from the amounts of imported butter consumed in this Colony.

There is also another fact which must not be lost of, and that is, that in the returns of imported butter, cheese, etc., previously referred to, these figures do not represent the amount of Dairy Products actually consumed in this Colony, as the following table will show :—

Imported Dairy Products Actually Consumed in Natal.

	1899.		1900.	
	Quantity. lbs.	Value. £	Quantity. lbs.	Value. £
Butter	1,232,958	45,949	334,502	18,271
Margarine	34,500	617	18,714	450
Cheese	311,943	7,918	108,769	3,926

In perusing the above figures it will be noticed that, although the quantities of Dairy Products imported to South Africa *via* Natal in 1900 (as shown by the first table of figures) are considerably in excess of those imported in 1899, yet the amounts actually consumed in Natal in 1900 are much less than those consumed in 1899. Again reverting to the first table of

figures, it is rather a significant fact to notice the increased quantity of margarine imported to South Africa in 1900 as compared with that imported in 1899. This all points to the need of legislation in this direction, and I have advised the Government that, in order to prevent a mixture of margarine and butter being sold as pure butter, no margarine imported to the Colony should be allowed to be coloured so as to resemble the natural colour of pure butter.

Margarine as a food is perfectly wholesome, and in its natural state is white, and does not in any way resemble butter; but if it is allowed to enter the Colony coloured in such a way as to resemble pure butter, it is very difficult to prevent its being sold to the public as butter. Considering that good margarine can be produced for about half the price of pure butter, apart from the fraud practised on consumers, there would be a very unfair competition with those who produced butter of pure quality.

It seems a pity that we have annually to import such large quantities of butter and cheese; and it is to be hoped that in the future, by more careful selection of our Dairy stock, by adopting more thorough and systematic methods of milking, by providing winter food for the milking stock, and by a more unanimous support of our Creameries, we shall gradually be able to reduce the importations of Dairy Products, as far as Natal is concerned, to a very small amount. I have often heard the somewhat lame remark made, "What is the use of having a Dairy Expert if we have to import our butter and cheese," but, unfortunately, up to the present, I have not been able to manufacture Dairy Products out of any other raw material than milk, and until we are in a position to treble our present outputs I am afraid importation must of necessity continue.

Treatment of Dairy Produce on the N.G.R.

This question of the treatment of Dairy Produce on our railways is one that is fraught with many difficulties, but still our railways are a medium through which the Government can assist the Dairy Industry to a greater extent perhaps than in any other way. Before the establishment of the present Creameries it would scarcely have been justifiable to have asked for better facilities for the conveyance of Dairy Produce, inasmuch as the Dairy Industry was then only in its infancy and the milk trade had not developed. But now matters have very much altered, and a considerable traffic in Dairy Products has been created. We must hope, therefore, that the railway authorities will do all they possibly can in helping to develop a growing industry, as so much depends on the condition in which such perishable articles as milk, cream, butter, etc., arrive at their destination. I have frequently brought before the notice of the Government the absolute necessity of providing cool cars for carrying Dairy Products in order that during the summer months these products may arrive at their destination in a firm and sound condition. In addition to the cool cars I have also strongly advocated the erection of shade houses for the protection of Dairy Produce at all stations on the line where the traffic warranted the erection of such houses. I am glad to say that these shade houses are now in course of construction. A cool car is also about to be built on most modern lines, and should this prove as successful as I anticipate, no doubt the use of cool cars will in the near future become quite general.

Mortality Amongst Calves.

Before closing my report I feel I must briefly touch on the mortality amongst young calves, which seems on the increase rather than decrease in Natal. During my numerous travels through the Colony I have exceptional opportunities of noting how the calves do in the several districts visited, and I feel bound to admit that in a few of the districts calf-rearing during the hot summer months is almost an impossibility. This being the case, I feel quite sure that farmers will in the future go in much more largely for winter calves than they have done in the past. In districts where calf-rearing in the hot weather is a difficult matter, I am convinced that winter calving is the proper course to take, and if the milk cows are properly fed, there is no reason why such calves should not thrive and do well; and there is no doubt that these winter

calves, if properly looked after, will come through the following summer without much risk.

There is also another factor which must be considered when trying to solve the problem why calf-rearing in Natal is not more generally successful, and that is the system so much in vogue throughout the Colony of rearing calves on their mothers and milking the mothers at the same time. I am quite aware that this cannot very well be avoided, but at the same time it is often the cause of much sickness amongst the calves, as it is seldom that a calf gets the same quantity of milk daily, sometimes getting too much, but more often not sufficient. This irregularity in the quantity of milk a calf receives is bound at times to produce sickness, and the only way out of the difficulty seems to be to bring the calves up by hand. At the Nel's Rust Dairy, under the able supervision of Mr. George Alexander, calf rearing by hand has been carried on throughout the summer with a considerable amount of success; but as Mr. Alexander's experiments have not been fully completed, I shall hope, in a future report, to deal more fully with this important matter of rearing calves by hand.

Veterinary Departmental Report for August, 1901.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

I BEG herewith to forward the monthly reports of the Veterinary Department for the month of August. Nothing of particularly noteworthy character has occurred. The District north of the Tugela is still extensively affected with contagious disease, and under the present conditions cannot but remain so. The continual movement of diseased stock will cease only with the cessation of hostilities. The Tuberculosis Law continues to justify its existence, and as long as intending importers fail to insist upon animals bringing with them a certificate of freedom from this disease, the loss and inconvenience attendant upon the application of the provisions of the law will be incurred by those neglecting this simple precaution.

Quarter-evil appears to be especially rife this season. Of the vaccine for this disease over 1,160 doses have been issued within the past month.

A further visitation of the disease rinderpest seems a certainty, and preparations are being made to meet it as far as possible.

H. WATKINS-PITCHFORD,
P.V. Surgeon.

19th October, 1901.

MARITZBURG. — D.V.S. WOOLLATT.

From the 1st to the 8th of the month I was on duty in Durban during the absence of D.V.S. Amos on leave. During this time one cow (Australian) was tested for tuberculosis. She reacted to the tuberculin test, and upon *post-mortem* examination was found to be suffering from generalised tuberculosis. The flesh was condemned as unfit for human food. Fourteen bulls arrived from England, 150 horses from Australia, and 50 mules from the United States. The remaining portion of the month has been taken up chiefly with office duties. A clean quarantine depôt for breeding stock was established during the month near Spionkop, and Mr. Stratford placed in charge.

On the grazing area for discharged transport oxen at Umhlamyo 682 head of oxen have been running during the month, and a total of 46 deaths have occurred as follows :—4, lungsickness ; 1, accident ; 41, poverty.

At Pieters, the clean quarantine depôt for oxen, 1,011 oxen were admitted, 595 oxen released, and 1,376 oxen were in the depôt at the end of the month.

HOWICK.—D.V.S. BYRNE.

Lion's River Division.

Scab.—I regret to have to report four fresh outbreaks of scab in the Lion's River Division.

There is no other contagious disease that I am aware of in this Division at present.

Upper Umkomanzi Division.

There are no fresh cases of scab in this Division. There are no cases of glanders,

lungsickness, or rinderpest in this Division; in fact, during the month cattle here have been particularly healthy, and all, with the exception of "loot" horses, are doing well.

Umgeni Division.

In this Division there are two flocks still under license for scab. Horses and cattle have been very healthy during the month of August.

Influenza.—The influenza and laryngitis outbreak seems to have passed off. I had only one case of laryngitis early in the month, and have not had another since, so I think the trouble has subsided.

Distemper.—I have had three or four cases of partial paralysis in the hind quarters of dogs as a sequel to distemper. If taken in time the animals do well. A laxative, followed by nerve tonics, slight stimulant to the loins, suitable diet, dry bedding, and good nursing are the chief lines of treatment to be observed. If left too long the treatment has to be more severe, and the result is not so satisfactory.

Fistulous wither.—I operated on a mare for "fistulous withers," the result of pressure from the "tree" of the saddle. A seton through the enlargement brought it down, but it swelled up again and had to be re-opened.

Colic cases, removal of the placenta from cows, lameness in horses, etc., have constituted the usual duties of this month.

DURBAN.—D.V.S. AMOS.

Glanders.—I found a clinical case of this disease in the stable belonging to Messrs. Williamson and Gawler, and reported to you specially. The remaining animals were tested. The stable has been thoroughly disinfected, and dangerous material has been destroyed by fire. Every precaution was taken and the stable is now re-occupied.

Horsesickness.—One case was reported to me, but it did not come under my personal notice.

Lungsickness.—One outbreak occurred at Stamford Hill. Since the first death there has been no death up to the present date. All the adjoining cattle that we can definitely trace as having come in contact are now in quarantine.

Two cases of purpura hæmorrhagica have come under my notice this month, one proving fatal.

One case of quittor; after the removal of a piece of nicrosed cartilage has done exceedingly well under ordinary antiseptic astringent injections.

IXOPO.—D.V.S. VERNEY.

Scab.—As is usually the case at this time of the year scab is fairly prevalent amongst the sheep, poverty of the sheep and scarcity of food being largely responsible for the abnormal amount of the disease.

Lungsickness.—Two outbreaks only of this disease exist.

During the month there has been a number of horses suffering from pneumonia, chiefly among horses that have been poor in condition and asked to do a lot of work on the roads. Most of the cases I treated were successful.

I had a rather interesting case in a pony showing an enlargement about the size of one's head, situated on the off-side ribs, extending from the 9th to the 15th ribs inclusive. The history of this enlargement was that the owner bought the pony two years ago, and then the enlargement was about the size of an orange, and from that time it has been steadily increasing, until at last it was impossible to put a saddle on the pony without interference with the enlargement. On manipulation there was no pain indicated, nor could the enlargement be reduced by pressure. The presence of a cystic tumour was rather indicated, but as the insertion of a trochar needle gave a negative result to this diagnosis, I decided to put the pony under chloroform and operate on it. The enlargement proved to be a lipoma with a cartiloginous base, which was firmly attached to the 11th rib. The tumour was 5½ lbs. in weight. I have been very busy this month, most of the cases coming under treatment being of an ordinary character.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—This disease still remains very prevalent in the Divisions of Newcastle, Dundee, and Ladysmith. The Upper Tugela and Umsinga are almost free from the disease, being due to the

fact that these Divisions have been practically outside the traffic in imported stock for some time past. The following number of fresh licenses have been issued during the month, viz., Dundee, 20; Newcastle, 22; Ladysmith, 6; Upper Tugela, 1; and Umsinga, 1. In all, 41 quarantines have been raised during the same period.

Scab.—Eleven fresh flocks have been placed under license during the month. I hope to see a considerable falling off in the number of cases during the next two months. Heavy rains have fallen throughout the whole of this district, and owners will in consequence be able to properly dip their sheep, and thus carry out the terms of the law without ill result to their flocks.

Several suspicious cases of rinderpest have been reported to me during the month. One case, in which three animals succumbed, proved to be lead poisoning. Another was found to be due to arsenical poisoning.

GREYTOWN.—D.V.S. CORDY.

Scab.—One fresh outbreak has occurred during the month. The number of flocks under license has diminished very much of late, the District now containing less scab than for some time past.

Lungsickness.—None.

Glanders.—None.

Rinderpest.—Nothing fresh has occurred in the quarantine area.

General.—Vegetable poisoning, which was responsible for the loss of many cattle during last month in this District, seems to be a thing of the past, as I have heard of no cases recently.

Enemies of Bees in South Africa.

MR. A. C. SEWELL, Berea Road, Durban, writes :—"I see from the last *Journal* that you have made use of the article from the "British Bee Journal" about South African bees, and therefore send another number that contains further information from the same source.

"The 'bee-pirate' alluded to is only too well known to bee-keepers here, and there is a third variety that I sent for identification two years ago, all belonging to the same family, and if anyone could procure a nest or two and send to me I would forward it. They live in sandy banks, but although I have traced them to their holes, have failed to discover the nest, as the banks are so honeycombed with tunnels of various insects."

The following is the article referred to. The writer is J. Martin Walmer, Port Elizabeth :—

Unlike England, we have no tits or toads to catch the bees, but we have other enemies of a most destructive kind. One is a small fly called the "bee-pirate" or bee-robber. This is the most formidable enemy of bees that I have ever seen. In watching the hives some time after my arrival here I noticed this fly hovering about the entrances, and so quick were its movements, I could not tell at first whether it was the bee catching the fly or *vice versa*. This fly will not touch the bee on the floor-board, although I have seen them alight close to catch the bee on the wing, but so quick is its action that the victim is seized and carried off in a moment! I have many times ran after the "pirates," but never could I locate them or find where they deposit their victim, nor have I ever seen them except in the vicinity of the hive; sometimes I have knocked down some of them just as the captured bee was being carried off, and I found the latter were nearly dead. I thought that the grip of the fly had either killed or paralysed them, as I have never been able to get the bees to sting me when caught, but you will see by the enclosed letter from the Government Entomologist, that in his opinion the fly stings the bee to death. They make their appearance in the beginning of summer and stay about three months; you will notice some of the smaller flies (enclosed) are darker that the larger ones; those I think are the younger insects. You will also notice that they are much smaller than the bee, and one would scarcely credit that such a small fly could carry away a

bee so swiftly. They are very tenacious of life, and will run readily off with a pin stuck through the body. I have only been able to catch them by striking them when on the ground with a flat piece of board. If knocked down with your hat they will at once rise again. It is not too much to say, I should judge, they will carry away thousands of bees in a day where there is an apiary of a dozen hives; in fact when the "pirates" appear about 11 a.m. the work of the hives is simply stopped, and on a beautiful summer day, when the bees should be out in their thousands, you would see all work suddenly stopped, and not a bee on the wing for several hours in the middle of the day. The "pirate fly" leaves off its destructive operations about 3 p.m., and then the bees start work again. Although not of a vindictive nature myself, I had no compunctions in killing these murdering little pests whenever I could, but I found them more than a match for me.

First Report of the Government Entomologist.

THE first report of the Government Entomologist for the period of sixteen months prior to the beginning of this year is now published.

The report contains information upon the more important insect and fungus pests of the Colony, and is published with a view of supplying a handbook for the use of the farmers of the country. Additional chapters are also written upon spraying and fumigating fruit trees for insect pests. Altogether there are 25 plates and a number of pen and ink sketches illustrating the various pests.

Among the items dealt with in detail mention may be made of the following :— Forage Blight, Mealie Variegation, The Witchweed, The Mealie Grub, Fruit Moths and Beetles, Fruit Fly, Jigger Flea, Plague Locust, Cockroaches, Aphides and Scale Insects, Ticks, and Fungus Blights.

Copies of the report will be supplied free on application to the Department of Agriculture, Maritzburg.

Locusts and Birds.

SAYS "Arator" in the *Advertiser* :— "I notice the *Agricultural Journal* records heavy swarms of locusts in the City on the 12th inst., and these were travelling south. Should we have rains during the next fortnight it is probable that wherever the locusts are now, there they will stay and breed, but if high and hot winds prevail they may collect again on the Coast lands. I do not hear of many Coast farms where there are many locusts, and so perhaps we may escape. It is satisfactory to learn from the *Journal* that the locusts seen in the City were suffering from the fungus disease.

"I have heard many complaints (says 'Arator' in reference to Mr. Allkin's letter in the last issue of the *Journal*) of the destructiveness of birds to the young mealies this year. The fact is that the young locusts have given birds so much food during the last few years that they have increased enormously, and, pending the hatching out of locusts, they must eat something, and are now going for the mealies. If locusts do not come down this year there is no doubt that a crusade will have to be waged against the increased number of birds. If any reader knows of a good preventive I would thank him to let me know of it.

"The higher the temperature of the cream at churning, the poorer the quality of butter," is coming to be an accepted principle of butter-making. It is, therefore of no use for a man to use a churn that can churn only at high temperatures, like some of the whirlmind and cyclone churns. Low temperatures for churning are the only ones that should be recognised.

Photo by Editor.

Mealie Hay.

IN the last issue was given an illustration of cattle grazing on cocksfoot grass at Mr. John W. Moor's farm, Mooi River. The present illustration shows another of Mr. Moor's winter fodders—mealie hay. The crop is cut when the mealies are becoming glazed. The land is the poor light red soil common to the Mooi River District, which, without assistance, will not grow a mealie two feet high. The fertiliser used was superphosphate : 2½ cwt. to the acre. What the soil with that assistance can produce is seen in the illustration. For further particulars see No. 7, Vol. IV.

Farm Education for Ireland.

STATE education for farmers and for children who will probably become farmers has become one of the most remarkable features of modern civilisation. In Great Britain the principle of voluntary or individual effort so cherished by the great economists of the earlier part of the last century has done much to retard State aid and direction in agriculture. Gradually, however, this principle is weakening, and before long it is possible that the British Parliament may take the lead in agricultural matters instead of being, as at present, in the wake of the Legislatures of her colonies and foreign countries. The following, which is summarised from the article of Mr. James Long in the "Manchester Examiner" shows what is about to be begun in Ireland :—

The Memorandum which Mr. Horace Plunkett as Minister of Agriculture and Technical Instruction has prepared for the guidance of the Irish people is a document which is crammed with matter which must prove helpful to all who read it carefully through. There is always a danger where men and money are available of going too fast ; but Mr. Plunkett is apparently determined that no unsound

or premature scheme shall have a chance of survival, especially as he desires to give practical advice to the adult as well as practical education to the young. Hired help in Ireland is probably more difficult to get than in the Colonies ; hence the importance of learning to be self-dependent. It appears that the Commissioners of Education are endeavouring to reform their entire system, with the object of making the instruction imparted in the schools under their charge more practical. This is important to the coming agricultural scheme, inasmuch as agricultural schools will depend for their utility quite as much upon other schools as upon themselves. When we are told that the importation of a foreign system of education is easy, we are met with the fact that, as Mr. Plunkett puts it, you cannot reap where you have not sown. The environment of the Irish farmer is not precisely that of the Swiss in the Grisons, the Dane in Seeland, or the Dutchman in the Polders. In Ireland the intention is to build the new structure upon a foundation, and that foundation is being laid. No collegiate institution is to be established until a constituency has been created to fill it. The time is not ripe, and the lads of to-day need the help of Professor Carroll's splendid little textbook, elementary though it be, rather than that of the science teacher and the laboratory. Our experience has been dearly purchased in England ; but the Irish Minister, while recognising its value, has determined to steer clear of it altogether. He tells us that colleges turn out professors but not farmers, and that farmers do not resort to them. Quite so ; the majority of our colleges are supposed to exist for the farmers' benefit, instead of which farmers consider them to be beyond their reach. In Ireland the work will commence with itinerant instruction, the utilisation of existing shools, and the training of teachers, while, later, technical schools will be instituted. In the near future every Irish county is to have its agricultural instructor- reminding us of the department professors in France. Such an official will lecture in well-defined districts during the winter, visiting farms and giving practical advice on the spot, supervising the work on the agricultural side in the ordinary schools, passing on to every man needing information precisely what he wants to know, and making him and his fellow-men contributors to the general fund of information through his own experiences, experiments, and observations. What sort of man is this instructor to be ? For clearly he must be an exceptional person, and clearly, too, he must be manufactured for employment on a large scale. Mr. Plunkett very properly lays it down that he must have had a first-class training in science. But scientific knowledge is to be no passport to profitable employment unless he has also had a practical training, and, if possible, he is to have been steeped in farming from his boyhood. Here the clear perception of the practical statesman is well exemplified, and it will be recognised once for all, in Ireland at least, that a purely scientific training does not qualify a man to instruct and advise farmers. No course of lectures, no classroom study or laboratory work can take the place of the daily life on the farm — the exercise of judgment in deciding when land is fit for the various operations, how to buy and sell with advantage, how to manage the numerous varieties of crops from sowing or planting to harvesting, how to drain, to repair and lay a hedge, build and thatch a rick, set a plough, start a binder, select seed, judge stock, break a colt, and a hundred other matters in relation to the practical conduct and business management of a farm Those who are outside agriculture, not excepting teachers who have had a scientific training, are prone to treat farming with too light a hand. The itinerant instructor in Ireland will practically be the central figure of what in America would be very much like a farmers' institute, and I should be glad to see his lecture-room closely resemble such an institution. Unhappily in England farmers who attend lectures are not imbued with the spirit of thorough inquiry, not only from the lecturer but from their neighbours. Nothing keeps an instructor up to the mark better than a good discussion after the lecture. The Irish instructor will have to answer all inquiries in his county and advise upon seeds, manures, and foods, name grasses and weeds, and adapt himself generally as guide, philosopher, and friend to the whole farming community. His work, however, will be supplemented by instructors in poultry-keeping, fruit-grow-

ing, gardening, beekeeping, and other industries, so that the number of expert hands required will be very great, and it is to be hoped that they will be forthcoming. There is the danger that, if the demand is greater than the supply, smart fellows of limited practical experience may be appointed, as half-trained dairymaids were appointed in the early days of the English county councils.

In dealing with school training, Mr. Plunkett says :—" We do not want children in the primary school to be taught practical farming." That would be impossible. But he does desire that they shall obtain some elementary notions of science, and that their faculties of observation shall be trained, especially as regards rural surroundings. Mr. Plunkett regards the years between 13 and 17 as the formative yerrs, and yet they are under existing systems lost to education altogether. The knowledge gained by the child up to 13 is in large part lost before he is able to supplement it by attendance at lectures or winter evening schools intended for lads of his age. Thus it is that the farm boy who has never been to school at all is often more handy than the lad who has passed through an elementary course. For one lad who becomes a student a score or more detest study in its every form, and in this way what men call "nature" preserves an eqnilibrium in the various and necessary vocations of life. It is proposed to open the door of the secondary school to the child from the elementary school, to arrange the teaching so that he may feel the benefit of it in his future career. He will receive, if he chooses, a two years' training in practical science and bookkeeping, while continuing his general work. Then he will be equipped for a course of instruction in technical agriculture, which it is proposed to provide during two winter sessions. Here, again, is a course which I found many years ago to be working well in Switzerland, and referred to in dealing with the agricultural practice of that essentially practical people. From these courses forward the road for the persevering boy is to be clear. Just as he will be eligible for a scholarship to pass him from the primary to the secondary school, so will he be able to pass from the secondary school to the college if he succeeds in a simllar competition. Some years ago I was enabled to recognise the value of this system. A student who had passed precisely by this process from the farm school to the college, and from the college to the headquarters of agricultural education in Paris, was placed in my charge. He had won a bursary entitling him to study in England, and it is here again that our English system fails. The foreigner sends his young men to this country with a year's allowance; we, on the contrary, are so satisfied with our defective knowledge that we ignore the practice altogether, and I do not hesitate to say that though the modern agricultural work conducted in foreign countries ought to have been published in England in large part through the medium of travelling students, it has found its way to the English people more extensively through these columns than through any other source whatever. What we need in agriculture is the best talent, and it matters not whether we find it in the son of the Irish peasant or the English peer.

Europe has been producing the men who have conferred renown on many countries for many years. There are among the living and the recently dead men like Fjord, Segelcke, Baug, Fleischman, Maercker, Konig, Wagner, Hellriegel, Miraglia, Deherain, Muntz, Nocard, Schlosing, and many others who have no counterparts among our British agricultural teachers. How should they ? With us the student goes direct from College to work, and this work makes him a mere machine for the rest of his life. Under the present *régime* the evolution of a great teacher is impossible, and I trust that the fact will not be overlooked, or the Irish College will never rank with those of other countries. There are already half-a-dozen students in training, and another gronp will soon commence work ; but the demand for instructors already exists, and it is urgent, so that English lads who have qualified may find room in some of the Irish counties.

The Farmers' Co-operative Company of New South Wales had an increase of trade for the year ended 30th June to the extent of £17,380. The net profit of the past six months' operations was £1,983, out of which a 5 per cent. dividend was paid to the shareholders, £518, and a bonus to the consignors and shareholders £750.

The Black Peach Aphis.

MYZUS CERASI, FABR.

By CLAUDE FULLER, Government Entomologist.

AMONG many other items of interest in the pages of the most recent annual report of the Cape Government Entomologist, mention is made of the fact that a considerable number of peach trees from Australia were seized and destroyed in Cape Town because they were infested with black aphis. Such drastic measures lead one to the natural conclusion that the pest has not gained a foothold in the Old Colony. Such a happy state of affairs does not, however, exist in Natal, as, upon several occasions during the past two years, my attention has been drawn to the insect in different parts of the Colony, and I cannot but think that it is much more abundant this spring than formerly. Still the aphis is not by any means as widely spread as it might be, so, perhaps, by drawing attention to it now, those who may find it on their peaches or nectarines will make an effort to keep it under control.

In common with numbers of others, this pest is an introduction from abroad, and whose original home is supposed to have been in Europe, where it occasions much mischief among cherry trees, a circumstance from which is derived its specific name *cerasi* (*cerasus*, a cherry tree).

Peach aphides in general form and habits much resemble the many other aphides common to the farm and garden, such, for instance, as the corn aphis, the rose aphis, and the turnip aphis. In this respect they are small, soft-bodied creatures of social habits, and feeding upon the juices of the host plant which they imbibe through a rostrum or beak suited for piercing the tissues and pumping up the juices. In common with other aphides also, the damage which results from their attack is due to the huge swarms in which they occur, and the multitudes which infest a single plant have their origin in the marvellous reproductive functions belonging to this group of insects. These procreative powers, coupled with an extraordinary prolific nature, readily explain the rapid increase of aphides, and whilst it would occupy far too much space to give a full explanation of them, it may be briefly stated that the insects have a sexless reproduction for the greater part of the year. The creatures possessing this remarkable faculty are known as "stem-mothers," and they produce young possessing similar functions with their own, and this goes on for many generations. These "stem-mothers" arrive at maturity—in the case of the black peach aphis—when ten days old (September and October), and give birth to an average of between five and six young per day uninterruptedly for about 20 days, at the end of which time, from observations which I have made, each "stem-mother" is the progenitor of about 2,813, and in seven weeks is the grand parent of 12,210 aphides and the great grand parent of some thousands more.

In this connection Reaumur, an eminent naturalist, calculated that one aphis may be the mother of 5,904,900,000 individuals during the six weeks of her existence.

Having once conceived the prolific and rapid powers of multiplication possessed by these insects, the farmer can readily realize the probable outcome of a small patch of aphis on any of the plants under his care, and he can also appreciate the value of a treatment which, if it doesn't destroy every aphis, will destroy fifty to eighty per cent. of them.

WINGED AND WINGLESS APHIDES.

The effect of the attack of the black peach aphis is particularly noticable in the spring, when the new growth of foliage is usually much stunted and deformed and encrusted with multitudes of the lice. If such an infected twig is examined, the insects will be seen in several

different forms. The young aphides are a light brown and somewhat transluent, whilst the adults are an intense and shining black. Among these latter numbers of winged insects will also be noticed, and also others with the wings just forming and still in the form of pads, pressed closely to either side of the thorax. This form is spoken of as the pupa or nymph, and from it develop the winged individuals. Its appearance among a colony appears to be due to the growing shortage of supplies, and the consequent necessity for a search for more food. The flying aphides have four wings, by the aid of which they can travel with the wind for good distances. The winged insects possess the same procreative functions as the wingless, and whilst they are never so numerous, still they help to spread infestation to a very great extent.

In Maritzburg the pest may usually be found upon peach trees, which have become infected, all the year round. During the winter months it confines itself more to the under-surfaces of low-lying branches, and also shelters around the trunk just beneath the surface of the soil. In the shelter of my own garden I also noticed it upon suckers which remained in leaf throughout the winter, and very early seedlings which sprouted there all had a colony upon the crown of the root early in September. Reproduction is very slight in the depth of winter, but directly the buds begin to swell the aphides reproduce rapidly, and, in the instance under my observation, this spring the tree was well infested before the flowers were out in August, and during September multiplied very rapidly and did considerable injury, despite the early advent of the rainy season. The effect of the attack is to dwarf the growth, so that shoots which should be five or six inches long remain stunted in the form of rosettes of distorted leaves. After a good spell of rain the tree recovers and makes some headway, but never makes the growth that it should.

Treatment.

The black peach aphis succumbs readily to contact insecticides, and for this purpose either paraffin emulsion or a decoction of tobacco and soap may be used with advantage. To be at all thorough the treatment must, of course, be an early one, and it is best to start by destroying those sheltering on the crown and lower parts of the tree during the cold weather. For this purpose my friend, Chas. French, the Government Entomologist of Victoria, who has given this pest more attention than I have been able to, recommends, after the removal of some of the surface soil (without uncovering the roots), the application of a couple of gallons to each tree of a solution of blue-stone, using one ounce to two gallons of soft water.

In spraying trees for this pest either the diluted paraffin emulsion or the tobacco and soap solution, the formulæ for making which are appended, may be used, but the degree of success will depend to a very great extent upon the thoroughness of the application and the quality of the pump used. As regards pumps, one is limited to the local supply, and so I can only recommend the Deming "Success" or "Galloway Knapsack," or the Nixon pump fitted to a barrel. To all these pumps Deming's fine Vermorel cyclone nozzle should be attached for this work in preference to the "Bordeaux" nozzles, or any of those supplied with Nixon's pump.

Deming's pumps are stocked by Messrs. Wilkinson & Co. and Steel, Murray & Co., Pietermaritzburg, and by Messrs. P. Henwood, Soutter & Co., Durban; the latter firm also stock Nixon's pumps.

Paraffin Emulsion.

Soap	... ...	1½ pounds.
Paraffin	... ...	5 gallons.
Water	... ...	2½ gallons.

Take whale-oil or common bar soap; cut up and boil until dissolved in water. While boiling add solution to the paraffin. Churn violently; five minutes if with pump or syringe, or fifteen if with paddle. Dilute, using nine parts of water to one of emulsion.

Tobacco and Soap Solution.

Tobacco (strong)	...	2 ounces.
Soap (common)	...	5 ounces.
Water	... ..	1 gallon.

Boil the tobacco thoroughly and strain; dissolve soap in hot tobacco solution and make up to one gallon.

Sex in Calves.

"JAVELIN," in the "Live Stock Journal," writes :—

The very interesting letter contributed to your last issue by Mr. Harvey Mason raises a discussion upon the important subject upon which he has written. This big question has long been a matter of debate, and it is likely to continue so until a somewhat remote future.

Mr. Charles Darwin wrote to me in 1876 and asked me to get information upon, as he expressed it, the control of sex, from the ablest persons of my acquaintance. I sought it and had letters, some of them very long, from the greatest experts then living in this kingdom. Their opinions varied considerably—even greatly ; but they all thought that the sex was determined, so to speak, *ab initio*, that is to say, that when conception occurred the sex of the animal was made positive. The various theories, 500 in number, had their several advocates. Some were certain that the results of their examination and experience were conclusive ; but as against that the experiences of other experimenters were distinctly hostile to those arrived at by these first-named gentlemen, and accordingly nothing at all was proved.

I sent these letters to Mr. Darwin, and he wrote expressing his thanks, and saying he was glad to have got a sight of these letters and the opinions contained in them. He could not agree with the views expressed by my correspondents, and why? The reason is as follows :—Mr. Darwin saw that the views held by my friends, that sex was at once established in the embryo, was a false one. He wrote me as follows :—"I think there is fairly good evidence to prove that in the embryo the animal is of both sexes (that is, hermaphrodite), and that after a time one or the other sex is aborted, leaving the animal of the other sex to that which is aborted, but what determines the abortion of one sex or the other seems at present unknown ; probably it depends on many causes."

Upon another point of view, and as upsetting the usual theories as to sex being controlled by service at one or other period of heat, there is the undoubted fact that some families continuously breed calves of one or other sex in excess.

In 1878, Mr. Darwin asked me if I could say if any families of Shorthorns were addicted to the habit. I replied that the Lupine family of Shorthorns which I had bred for years always gave an excess of females ; and Mr. Jones, of Mullinabro', Waterford, wrote me that he had bred the tribe for forty years, and they invariably produced an excess of females. Again, the great pure Booth Mantalini tribe, which the late Mr. Thomas Barnes, of Westland, cultivated for thirty-five years, produced, much to his discomfort and loss, an excess of males.

The females of this splendid tribe were worth 500gs. and 750gs. each ; the bulls were comparatively of small value.

Then when Mr. Barnes crossed Sylph—the great prize cow of the tribe—with the Bates sire Third Grand Duke, the family took a distinct departure from their former habit, and they bred an excess of females, much to his gratification and delight. I mentioned to Mr. Darwin these distinct proclivities in regard to these two tribes of Shorthorns, and the result of his consideration was given to me in his letter as follows :—From what you tell me I think I may venture to assert that occasionally a tendency to produce one or other sex in excess appertains to certain families of Shorthorn."

The conflict accordingly between all the 500 theories and the actual experiences of breeders is very strong and confusing, and the varied views all tossed together appear to me to have some resemblance—indeed, a very distinct resemblance—to a knotted skein of silken thread.

The fact is that the discussion of the various influences which are or may be held to influence and control the determination of sex is exhaustless.

Buck Jumping.

A CORRESPONDENT recently wrote to us (' The Pastoralists' Rewiew") to enquire the authorship of the following verses, which appeared in our issue

of September, 1892. They have now been kindly forwarded to us by a correspondent from Tambo, Queensland, who writes :—"It is thought here that the author is Mr. R. W. Stewart, the manager of Mitchell Downs, Roma, who is a great horseman" :—

"Snake!' how the word ever serves to recall
That pony, all sinew and muscle,
Who gave me one tremendous fall,
And many a terrible tussle!

Strong limbs, and supple, his head set on
In a way that was just perfection,
With a curve in his neck (like the neck of a swan)
In exactly the right direction.

Such a back and loins, and beautiful crest,
And a barrel round as an apple;
And I know I can scarcel say, of the rest,
With which it was hardest to grapple.

For I've sat on his neck, behind his ears,
And I've sat behind my saddle,
And I found him, with kicks, and bucks and rears,
A most awkward canoe to paddle.

Dark lustrous eyes, with a menacing frown
No woman's were ever more splendid,
More bright, or more beautiful liquid brown,
Or more with wickedness blended.

I used to think of the beggar by day,
And I used to dream of him nightly,
And how I longed to be able to say,
"At last I can ride you rightly."

And with every day I used to find
The fascination grow stronger;
Till at last I finally made up my mind
That I would delay no longer.

I remember the morning, cold and grey,
And how I tried to dissemble
That the nasty cold raw feel of the day
Was the reason that made me tremble.

"Charlie" and "Bungaree," darkies two,
Sat up on the stockyard railing,
An I said an occasional 'Budgery you!"
To prevent my heart from failing.

(Poor fellows! Now to "kingdom come"
I hear they have both departed;
One died of a cold, the other from rum;
But the pair were really good-hearted.)

I remember well the whistling snort
That shook my self-reliance,
As you boldly faced arouud, old sport,
And bade me a cool defiance.

As I looked in your face I shall never forget
The evil look that you gave me,
And the "strike" you struck at my head, and yet
After all you did but shave me.

You stood like an image as I drew tight
Each girth almost to the bursting;
You were thinking, no doubt, of the coming fight,
For which I believe you were thirsting.

I carefully tightened the near side rein,
Till your nose was touching my shoulder;
And I thought, as I grasped a lock of your mane,
That you villain, you only looked bolder.

And as I got up with the utmost care,
And you never attempted to "hook it,"
My goodness! how those darkies did stare
To see how quiet you took it.

But I knew very well 'twas an ominous sign,
And I felt my face grow whiter;
And I said to you, "Yes, this is all very fine,"
As I set myself down a bit tighter.

Four miles we had gone; I was watching you;
Could it be that your manners were mended?
The blackboys laughed, and I laughed too,
But the laugh was mighty soon ended.

What happened exactly I never could say,
But all that I'd seen before me
Had gone in a most mysterious way
As through the bushes you tore me!

A sudden stop, and a furious bound,
Our course exactly reversing,
Brought me uncommonly close to the ground!
I'm afraid that I started cursing.

Now, I felt on my face your waving mane,
And *then*, such a shock behind me;
I can ride that ride here over again,
Where changes of circumstance find me.

Backwards, forwards, dashing round,
I shall never forget the feeling,
Nor the rattle of buckles and straps, and the sound
Of the devil beneath me squealing.

By the mane, by the saddle, the bridle, all,
I was clinging in desperation;
I'd have collared the tail to have saved a fall,
But for its wrong situation.

"Budgery ride, by Golly! hey!"
Together the darkies shouted;
I knew, in spite of all they might say,
The end they never had doubted.

To be riding "all over" from head to tail,
A horse that is perfectly frantic,
Is a game that I must say soon becomes stale,
And it certainly isn't romantic.

But all things end—the worst and the best.
So far I'd stuck to the leather;
"Snake" very suddenly ended the rest,
For we both came down together.

Side by side for a moment we lay,
There wasn't much time for talking;
With a bound and a kick he darted away,
And left me behind him—walking.

Well! well! I look back and think of his hate—
It's well to be honestly hated;
He was always to me a dangerous mate,
As ever the Lord created.

But I'll say of him, though he became my slave,
And for years I used to ride him,
That at least, though wicked, he still was brave;
So may no ill betide him.

And if of this life he's ended his lease,
So that there the whole thing ceases,
I would possibly wish he might rest in peace—
Only probably now he's in pieces.

One thing in the lines that compose this lay
And perhaps their small merit enhances—
Is, only, that I can truthfully say
That they simply are facts and not fancies.

R.W.S.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	F. R. Moor ...	Greystone.
		,,	Cooke & Co. ...	Blue Krantz.
		,,	F. Bloy ...	Monte Christo
		,,	J. G. Maritz ...	Vi Plaats.
		,,	F. Knapp ...	Klipfontein.
		,,	G. M. Rudolph ...	Spitzburg.
		,,	J. W. Moor ...	Moorleigh.
		,,	Nqatabaan ...	Moord Spruit.
		,,	J. Oates ...	Oatsvale.
		,,	P. J. Bester ...	Rensburg Spruit.
		,,	R. C. O'Neil ...	Hillgrove.
		,,	C. J. Labuscagne...	Haatsfontein.
		,,	B. J. Wilkes ...	Portington.
		,,	J. G. Hatting ...	Rama.
		,,	A. G. Harding ...	Marshlands.
		,,	Du Plessis & Cloete	Compensation.
		,,	J. Van der Merwe	Welgekoose
		,,	A. Pretorius ..	Shypoort
J. Button ..	Estcourt, South of Bushman's River	,,	S. Nel ...	Wagon Drift.
		,,	C. Cope	The Hoek.
		,,	C. B. Lloyd ...	Hidcote.
		,,	Mrs Lindsay	Rosebank.
		,,	Geo. Gibson ...	Craignevin.
		,,	S. C. Boshoff ...	Waterhoek.
		,,	L. Schomann ...	Twyfelfontein.
		,,	S. Schomann ...	Willow Grange.
		,,	C. Groom ...	Springvale.
		,,	W. McFie ...	Highlands.
		,,	J. K. H. Miller ...	Beacon Hill.
		,,	J. Piccione ...	Greenfields.
		,,	F. Stanley	Nonpariel.
		,,	H. E. Kirby ...	Klipfontein.
		,,	A. G. Stead	Allendale
		,,	J. Marais ...	Malan Spruit
		,,	A. Lawrence ...	Grantleigh.
A. H. Ball	Weenen ...	,,	W. Lotter ...	Doornkloof.
		,,	P Van Rooyen ...	Middleburg.
		,,	C. P. F. Van Rooyen	Mona.
		,,	P. M. Lotter ...	Waterfall.
		,,	S. C. Van Rooyen	Middleberg.
		Lungsickness	Mgina... ...	Location
		,,	Maboko	Bushman's River Poort.
J. J. Hodson ...	Lion's River ...	Scab	W. Taylor ...	Fordoun.
		,,	W. T. Shaw ...	Shawswood.
		,,	W. Pepworth ...	Bolesworth.
		,,	Mrs F. McKenzie	Onverwacht.
		,,	W. L. Methley ...	Newstead.
		,,	J. J. Morton ...	Sherwood.
		,,	F. Curry ...	Weltevreden.
		,,	Geo. Woodhouse	Halliwell.
		,,	Jas. Ross ...	Gowrie.
		,,	A. Meugens ...	The Mains.
E. J. B. Hosking ...	Upper Umkomanzi	,,	A. G. Mack ...	Misty Home.
		,,	Mr. Gibson ...	Howard's Hill.
R. J. Raw .	Impendhle ...	,,	T. Fleming ...	Good Hope.
		,,	J. W. Brooke ...	Impendhle Store.
		,,	G. Renyard ...	Hamilton Hall.
		,,	A. C. Crosse ...	Dingley Dell.

Stock Inspector.	District.	Disease.	Owner.	Farm.
R. J. Raw ...	Impendhle ...	Scab	R. Gresham ...	Castle Howard.
		Lungsickness	C. C. Lewis, and Native ...	Clairmont.
W. Wilson	Polela	Scab	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
		,,	R. C. Gold ...	Woodend.
		,,	R. M. Arbuckle ...	Costmore.
		,,	J. J. Van Dyke ...	Riverport.
		,,	J. Van der Merwe	Nooitgedacht.
		,,	S. Maritz ...	Maritzdale.
		,,	F. E. Peto ...	Clovelly.
		,,	H. Nicholson ...	Fondling.
		,,	H. C. Gold ...	Dartford & Greenend.
C. E. Hancock ...	Ixopo ...	,,	R. Kennedy ...	Cornbill.
		,,	A. Watson ...	Rosehill.
		,,	W. Gray ...	Helmsley.
		,,	Natives ...	Langefontein.
		,,	J. Dalgarno ...	Abercairney.
		,,	A. Stone	Craigie Lee.
		,,	W. W. Walton ...	Dronk Vlei.
		,,	P. J. Webb ...	Crystal Manor.
		,,	L. Howes ...	Mornington.
		,,	G. Thompson ...	Cromwell.
		,,	J. Anderson	Littledale.
		,,	Est. R. Raw ...	Eastwolds.
		,,	Lulakana ...	Mackenzie's Farm.
		,,	A. E. Keith ...	Norwood.
		,,	J. W. Marwick ...	Flettsberg.
J. F. Bernard ..	Newcastle	Lungsickness	P. W. Dept. ...	Newcastle T'Lands
		,,	F. A. R. Johnstone	Craig, Matanda and Glencalder.
		,,	A. Paine ...	Mount Prospect
		,,	Simeon Ndhlovu	Freda.
		,,	C. R. Savory ...	Pomeroy and Evin
		,,	Blizzard & Pratt	Ingogo.
		,,	G. Wood ...	Heron's Court.
		,,	A. F. Henderson...	Brazil.
		,,	Lowrens and Van der Merwe ...	Buffalo River.
		,,	H. Fick ...	Northdown.
		,,	T. L. Möller ...	River Bend.
		,,	Natives ...	Elizabeth Dale.
		,,	J. Masangu ...	Pernambuco.
		,,	Funwayo ...	Tiger Kloof.
		,,	Umketega ...	Vrede.
		,,	A. J. Hurd ...	Tweefontein.
		,,	G. J. Way (Derelict Stock) ...	Vrede.
		,	Mahakan ...	Kilbarchan.
		,,	Umbetta ...	Freda.
		,,	Maling & Sibibi...	Blauwboshlaagte.
		,,	S. W. Reynolds ...	Ramsgate.
		,,	Jack Unguni ...	Blauboshlaagti.
		,,	Umpegelele ..	Kilbarcean.
		,,	S. W. Reynolds ...	Minster.
		,	Umgodini & Kumalo	Greenwich.
			Umbobojan ...	Valsefontein.
		,,	Mrs. H. C. Shorter and Sambana ...	Spectacle Spruit.
		,,	J. T. Grant ...	Rooi Pont.
		,,	C. Jackson ...	Yarl.
		,,	H. C. Dicks ...	Minster.
		,,	McMurray & Hurd	Greenwich.
		,,	Tinta ...	Ballengeiches.
		,,	Verasamy ...	Newcastle.
		,,	Tunziane ...	Blauwboshlaagte.

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. F. Bernard ...	Newcastle ...	Lungsickness	Umkonazi & Pochies	Milton.
		,,	Freeman ...	Shakespeare.
		,,	Jim Gama .	Blauwboschlaagti.
		,,	A. James ...	Kabbaslaagti.
		,,	A. Osborn ...	The Mount.
		,,	J. C. Richards ...	Rooi Pont.
		,,	J. Kumalo and Ndhlebe	Massondale.
		,,	Makehla ...	Tiger Kloof.
		,,	Nehorasing ...	Newcastle.
		,,	Indians ...	Bosch Hoek.
		,,	Inkombe ...	Vlak Laagte.
		,,	Sehlunga ...	Blauwboschlaagte.
		,,	Machambu ...	Tiger Kloof.
		,,	Umhlala and Ningazana	,,
		,,	Mgomana ...	Ardrossan.
		,,	Jusveer ...	Lennoxton.
		,,	Petrus ...	The Reserve.
		,,	J. W. Goodwill ...	Cornwall.
		,,	Samiella ...	Duck Ponds.
		,,	Gizana ...	Buffalo River.
		,,	Sowan · Umkondo Skibells ...	Parksville.
		,,	Natives ...	Milne Dale.
		,,	Quehlele	Lauriston.
		,,	Newcastle Corporation ...	Newcastle.
		,,	J. R. King ...	Yarl.
		,,	Mrs. Eicke ...	Angora Hill.
		,,	Sknells ...	Parksville.
		,,	Nduka ...	Duck Ponds.
		,,	Magnali & Quach	Yarl.
		,,	W. C. F. Napier ...	Roodepoort.
		,,	G. F. Andrews ...	Mooi Krantz.
		,,	Zime, Jenulli and Mapecta	Shakespeare.
		,,	G. F. Fraser ...	Ingogo.
		Scab	G. Star ...	Duck Ponde
		,,	C. G. Palmer ...	Dry Cut.
		,,	J. Davidson ...	Lennoxton.
		,,	G. Wood ...	Heron's Court.
		,,	A. D. Uys ...	Horn River and Mooi Krantz.
		,,	T. Ferrier ...	Henley.
		,,	G. Jackson ..	Try Again.
		,,	W. Richards ...	Tweefontein.
		,,	W. E. Few ...	Erin & Imbezana.
		,,	Blizzard ...	Ingogo.
		,,	W. Short ...	Potter's Hill.
		,,	J. Matthews ...	Shakespeare.
		,,	G. Brown ...	Wykom.
		,,	G. W. Nourse ...	Blauwboshlaagti.
		,,	R. S. Armitage ...	Boschhoek.
		,,	H. P. Beare ...	Harte River.
		,,	— Wood ...	,,
		,,	Jim Smith ..	Lennoxton.
		,,	S. W. Reynolds ...	Minster & Ramsgate
		,,	N. H. Fick ...	Wykom.
		,,	A. Vanderplank ...	Eagle's Cliff.
		,,	W. Nicholson ...	Roei Poort.
		,,	M. C. Behr ...	Shuttleworth.
		,,	H. Meek ...	Diepe Hooten.
		,,	J. McDonald ...	Yarl.
		,,	John Vos, jun. ..	Belfast & Manning.
		,,	Mrs. John Vos, sen.	Landsend.
		,,	A. G. Robertson...	Craigholm.
		,,	Con. Watson ...	Bismarck.
		,,	R. M. Eksteen ...	Belfast.

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	W. Oldfield ...	Ambleton.
		„	Pietermaritzburg Corporation ...	Sanitary Depôt.
		„	F. Knapp & Nonshlene ...	Polly Shorts.
		„	J. Townsend ...	146, West Street, Pietermaritzburg.
		„	T. Owen ...	9, Pietermaritz St.
		„	P. H. McCrystal...	11, „
		Scab	Dickinson Bros. ...	Braeburn.
		„	Ulukozana ...	Bishopstowe.
		„	Bobobo and Umbabana	Zwaartkop Location.
J. Chaplin ...	Klip River ...	Lungsickness	A. H. Spring ...	Reserve.
		„	A. Armstrong ...	Ladysmith T'Lands
		„	S. Woods ...	„
		„	J. Piccione ...	Grobblar's Kloof.
		„	Natives ...	Putunca's Spruit.
		„	R. P. Leonard ...	Alexandra
		„	G. Pinkney ...	Kethain Glen.
		„	J. B. Wessels ...	Beanvale.
		„	— Petty ...	Modder Spruit.
		„	W. J. Webb ...	Kleinfontein
		„	H. E. K. Anderson	Gedula.
		„	E. F. Gibbens ...	Plaat Berg.
		„	Natives ...	Georgina.
		„	Nondo Gama ...	F. J. Dewaal's farm
		„	A. Boers, & Native	Marais Vel.
		„	W. Neizel, & Natives	Roosboom.
		„	Natives ...	Doornkraal.
		„	F. N. Nel ...	Catherine.
		„	Natives ...	Macpherson'a farm.
		„	Natives ...	Roodepoort.
		„	Natives ...	Reit Kuil.
		„	A. S. McHattie ...	Wessel's Nek.
		„	Scomber ...	Kleinfontein.
		„	Natives ...	Dreifontein.
		„	Malela ...	Reit Kuil.
		„	P. W. Dept. ...	L. Smith Tn. Lds.
		„	Myanga Tigalala...	Umhlumayo.
		„	T. Wright	Davel's Hoek
		„	P. Tondo	Weston
		„	H. Neville	Quagga's Kirk
		„	M. Shea ...	Ladysmith Town Lands.
		„	P. Kumalo ...	Roodeport.
		„	Pepworth & Reid	Reitfontein.
		„	W. H. Roberts ...	Arcadia.
		„	H. Mundey ...	Morden.
		„	J. O. Potterill ...	Doorn Kloof.
		„	Wetherill Bros. ...	Walker's Hoek.
		„	— Coventry ...	Groote Hoek.
		„	Cochrane & Illing	Umbulwane.
		„	— Hazel ...	Roosboom.
		„	— Field ...	Roodepoort.
		„	Peddie & Moore ...	Dew Drop.
		„	A. W. J. Boers ...	Weston.
		„	M. Shea ...	Bester's Station,
		„	J. Piccione ...	Nooitgedacht.
		„	Johannes ...	Roosboom.
		„	Umlandla ...	Reit Kuil.
		„	Mushwishwe ...	Ladysmith Town Lands.
		„	T. Bennett ...	Umbulwana.
		„	H. Fuhri ...	Dew Drop.
		„	Shoon and Boomplas	Reit Kuil.
		„	Kitchemasane ...	Groote Hoek.

Stock Inspector.	District.	Disease.	Owner.	Farm.
J. Chaplin ...	Klip River ...	Lungsickness	Blackmore ...	Ladysmith Town Lands.
		,,	Inyakamobi ...	Brakfontein.
		,,	Ukonya Stebe ...	Roodepoort.
		Scab	J. H. Newton ...	Arnot Hill.
		,,	G. Byloo. ...	Underberg.
		,,	P. Nicholson ...	Walker's Hoek.
		,,	C. O. C. & S. Carbutt	Matiaan's Kloof.
		,,	R. D. Smith ...	Klip Poort.
		,,	C. Thornhill ...	Eendt Glen.
		,,	Tatham & Pascoe	Kivesfontein.
		,,	G. Wetherill ...	Walker's Hoek
		,,	A. Krogman ...	Brakfontein.
		,,	M. W. Krogman...	Dreifontein.
		,,	P. Marais ...	,,
		,,	H. Boers ..	Dew Drop.
		,,	G. Spearman ...	Feir View.
		,,	J. Van Reenen ...	Wessel's Nek.
		,,	A. Boers ...	Marais Vel.
		,,	A. Carbutt & J. Good	Matiwaan's Hoek.
		,,	Sparks Bros. ...	Ladysmith.
		,,	G. Innes ...	Eland's Laagte.
		,,	A. J. Taylor ...	Arnot Hill.
		,,	R. Horsley ...	Warrock.
		,,	Dr. Helps ...	Roosboom.
		,,	Corrigel ...	Koolfontein.
		,,	H. S. Bowers ...	Zaaifontein.
		,,	A. Henderson ...	,,
		,,	A. Henderson ...	Eenvogle Vlei & Elandslaagte.
		,,	G. Ashby	Acol
		,,	W. Wright ...	Colworth.
		,,	H. & E. Bowes ...	Quagga's Kirk.
		,,	B. C. Labuscagne	Ladysmith Town Lands.
		,,	E. Brayshaw ...	Roodepoort.
		,,	Pepworth & Reid	Reitfontein.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	H. F. Pearson ...	Everton.
		,,	Muti ...	Infuni M.S.
W. Freer ...	Upper Tugela ..	,,	Jansbey & Indabazimbi ...	Acton Homes.
		,,	J. W. Coventry ...	Fair View.
		,,	C. Coventry ...	,,
		,,	H. Murdoch ...	,,
		,,	Umbosch ...	Klaarfontein.
J. R. Cooper ...	Nqutu & Nkandhla Districts, Zululand	,,	A. Barklie ...	Nqutu Hill, Nqutu District.
		,,	Natives ...	Telezi Hill, ,,
		,,	,,	Nquiu Hill, ,,
		,	Umasera ...	Hlati Spruit, Nqutu District
		,	Natives	Mangeni, ,,
		,,	H. Fry ...	Mpandhleni, Nkandhla District.
		,,	Hutchinson and Hyslop	Near Magistracy, ,,
		,,	H. Swanfield ...	Qudeni, ,,
		,,	Schonyana ...	Babanangu ,,
		Scab	Messrs Havemann	N'Tingwe.
		,,	W. Calverley ...	Nkandhla District
		,,	Struben, Bottomly and Loxton	,,
		,,	W. Berry ...	,,
		,,	J. Hutchinson ..	,,
G. Grelink ...	Eshowe. ...	Lungsickness	Sibebile ...	Matikulu, Eshowe District.
	Entonjaneni, and Umfolosi Districts, Zululand.	,,	Umhlukwana ...	Umsunduzi, ,,
		,,	A. Garland, ...	Bond's Drift, ,,
		,,	G. Higgs & Co. ...	Umhlatuzi, ,,

Stock Inspector.	District,	Disease.	Owner.	Farm.
G. Gielink ...	Entonjaneni and Umfolosi Districts, Zululand	Lungsickness	P. W. Labuscagne	Umhlatuzi, Eshowe District.
		,,	F. McGuire ...	,, ,,
		,,	L. Schultz ...	Near Eshowe. ,,
		,,	Luigie ...	Umfuli, Entonjaneni District.
		,,	L. Kritzinger ...	Osborn. ,,
		,,	R. J. Ortlepp ...	Merino, ,,
		,,	J. Fry ...	Empepala, Eshowe ,,
		,,	James Umtembu	Entumeni, ,, ,,
		,,	J. R. White ...	Schuithoek, Entonjaneni District.
		,,	W. Magee ...	Umlalazi, Eshowe District
		,,	G. Müller ...	Duikerhoek, Entonjaneni District.
		,,	F. Buys ...	Barneveld ,,
		,,	Damusa ...	Kemp's Farm, Melmoth ,,
		,,	F. A. Ortlepp ...	Saxony ,,
		,,	T. Smith ...	Oakdale ,,
		,,	J. A. Ortlepp ...	Vlakbult ,,
		,,	J. R. White ...	Elizabeth ,,
		,,	T. Cooper ...	,, ,,
		,,	E. W. Lamb ...	Amatikulu, Eshowe District.
		,,	C. Adams ...	Umlalazi ,,
		,,	F. Dickens ...	,, ,,
		,,	Carlie ...	Imfuli M.S., Entonjaneni District.
		,,	C. J. Van Rooyen	Wansbeck, Entorjaneni District.
		,,	H. A. Liversage ...	Morgeson, Entonjaneni District.
		,,	Umlomo-Umdinwa	Ematikulu, Eshowe District.
		,,	L. Botha ...	,, ,,
		,,	P. Nel ...	Noitegedacht, Entonjaneni District.
		,	Josiyasi	Umlalazi, Eshowe Division
		,,	J. Vermaak and Muller	Umhlatusi Valley
		,,	Springer	Empangeni, Lower Umfolosi District.
		,,	C. Adams ...	Umhlatusi, Eshowe District.
		,,	Herps & Smith ...	Umlalazi ,,
		,,	Umgumeni ...	Inyezane, Umlalazi District.
		,,	Mahlahlana ...	Amatikulu, Eshowe District.
		,,	Ngalo ...	,, ,,
		,,	J. Nottman ...	Umlalazi ,,
		,,	L. Ferreira and J. Ortlepp ...	,, ,,
		,,	J. Piere ...	Inyezane ,,
		Scab	R. J. Ortlepp ...	Merino, Entonjaneni District.
		,,	S. Maritz ...	Melmoth.
W. W. Dore ...	Portion of Zululand North of White Umfolozi and Umfolozi Rivers	Lungsickness	Dinizulu ...	Hlabisa District.
		,,	Surrendered Boers	,,
		,,	C. Wheelwright ...	Nkonjeni, Mahlabatini District.
		,,	— Van Rooyen ...	,, ,,
		,,	E. Loffler ...	Bulwana, ,,
		,,	Magojala ...	,, ,,
		,,	Mapangisa-Zambula	Ingwavuma District.

Stock Inspector.	District.	Disease.	Owner.	Farm.
W. W. Dore ...	Portion of Zululand North of White Umfolozi and Umfolozi Rivers	Lungsickness	Nsicongo-Umkoombuzi	Hlabisa District.
		,,	Nomacamcam-Dada	,,
		,,	Noham-Ukusa ...	,,
		,,	Mahakan-Mangaba	,,
		,,	Mangumsan-Matanta	,,
		,,	Umhoomo-Umcatusa	,,
		,,	Umlogotwa-Buzani	,,
		,,	Gufa-Nsihow ...	,,
		,,	Umhangan-Southwala	Ndwandwe District.
		,,	Nyati-Umlangeni	,,
		,,	Ngoma-Nquabalana	,,
		,,	Putama-Makatumi	,,
		,,	Somcuba-Vuvama	,,
		,,	Shlomusa-Umcandacanda	,,
		,,	Mau-Mandula ...	,,
		,,	Umkupuku-Faku	,,
		,,	Mabogo-Umgimu	,,
		,,	Mapaza-Undabuko	,,
		,,	Mazunyo-Mutcha Impeni	,,
		,,	J. Crossly ...	Makowe Store.
		,,	T. Reid ...	Nhlwati.
		,,	Wessell & Finetti	Mapangisa, Ingwavuma District.
		,,	Mwzinyankomo, Zambula	Ingwavuma District.
		,,	Umgidtshiman, Putasa	,,
		,,	Charley ...	,,
A. Klingenberg ...	Umsinga ...	,,	Ungangaza ...	Pression.
		,,	E. V. L. DuBois ...	Vergelugen.
		,,	H. Müller ...	Vermaak.
A. J. Marshall ...	Dundee ...	,,	Natives ...	Renier.
		,,	Natives ...	Maybole
		,,	Umonto ...	Crown Lands, near Dundee.
		,,	J. Kemp & Natives	Kelvin.
		,,	J. H. Reis ...	Longfontein.
		,,	J. Landman ...	Boschfontein.
		,,	D. C. Pieters ...	Goedekeus.
		,,	J. A. Naude ...	Dewarsberg.
		,,	Umsombuloko ...	Hatting Dale.
		,,	Umnyesa ...	Klipwe.
		,,	Turton Bros. ...	Hayfield
		,,	H. Sehroeder ...	Rosenen
		,,	G. H. Stokes ...	Ruigetfontein
		,,	P. Z. Gouws ...	Kelvin
		,,	E. G. Wohlitz ...	Stille Rust
		,,	—Newby & Native	Carolina}
		,,	G. F. Dannhauser	Cardwell.
		,,	Umbyembye ...	,,
		,,	Unchumulo ...	Waschbank.
		,,	J. Honeywill ...	Dundee.
		Scab	A. Jansen ...	Sheepridge.
		,,	J. H. Erkland ...	Carolina.
		,,	J. H. Reis ...	Longfontein.
		,,	J. W. Dupreez ...	Jackalsfontein.
		,,	H. J. Hearn ...	Hatting Spruit.
		,,	C. F. Van Rooyen	Davelsberg.
		,,	Maritz & Thornhill	Aletta.
		,,	P. J. Gouws ...	Kelvin.
		,,	Murray & Co. ...	Navigation Collieries
		,,	P. H. Swart ...	Hartebeestefontein.

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. J. Marshall ...	Dundee ...	Scab	H. J. Nel ...	Blinkwater & Evansdale.
		,,	D. Meumann ...	Waterfall, Beith, Beacon Hill, and Paddock.
		,,	Peerbhoy ...	Dundee.
		,,	H. J. Hearn ...	Double Kraal.
		,,	A. B. Daniel ...	Beith.
		,,	H. Kriel ..	,,
		,,	F. Kolbe ...	Langfontein & Staat.
		,,	G. Colbe ...	Zwaartwater & Rest
		,,	R. J. Marshall ...	Cleveland.
		,,	J. Kemp ...	Kelvin.
		,,	J. Campbell ...	Manor Park.
		,,	Marshall Bros. ..	Cleveland.
		,,	J. Meyer ...	Mauchline.
		,,	A. J. Potgieter ...	Dewarsberg.
		,,	Kriel & Daniel ...	Beith
		,,	J. Landman ...	Boschfontein
		,,	H. Davel	Klipsruy
		,,	N. F. Hesom ...	Helena
		,,	E. G. Wohlitz ...	Stille Rust
		,,	J. J. Gregory .	Cotswold
		,,	E. J. Stepney ...	Uitray
		,,	L. Hedder ...	Roadside
W. A. Hutchinson	Alfred ...	,,	W. Stafford ...	Sutherland.
		,,	Nqubu ...	Location.
		,,	Makubana ...	Amaci Location.
		,,	J. S. Payn ...	Furney Hill.
		,,	J. Wessels ...	Sheepwalk.
		,,	G. Whitelaw ...	Deemount.
		,,	Geletu Flentyi ...	Location
		,,	Inkubi and Duli ...	Location
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	P. Van der Reit ...	The Bend.
		,,	F. E. Zunckel ...	,,
		,,	J. Lawford ...	Emmadale.
		Scab	A. J. Harding ...	Zwart Kop.
		,,	J. Dryer ...	Culfergie.
		,,	J. M. Wales ...	Farleigh.
		,,	D. Evans	Zuur Laager
G. N. Perfect ...	Umvoti — Eastern Portion	,,	L. J. Nel ...	Glenboig.
			J. M. Botha	Baviaankrans.
E. Varty ...	Umvoti, Western Portion	,,	J. M. Van Rooyen	Pompoennek.
A. S. Parkinson ...	New Hanover ...	,,	Ingongoni ...	King's Cliff.
		,,	R. Smith ...	Effingham.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	— Thompson ...	Marburg.
		,,	W. Clothier ...	Ultima Thule.

The whole of that portion of the Colony north of the Tugela River and the Province of Zululand have been proclaimed by the Governor an infected area under the Lungsickness Act.

Principal Veterinary Surgeon's Office, 6th November, 1901. M. J. HIME, for P. V. Surgeon.

Imported Friesland Bulls.

PEDIGREES of two Friesland bull calves just imported by Mr. P. Otto, J.P., of Somerville, Reit Vlei, viz. :—

"Pel," No. 810, Calf Herdbook, sire "Willem," No. 2,585, dam "Pel XX," No. 8,329, born 18th February, 1901.

"De Wet," No. 105, Calf Herdbook, sire "Kruger," No. 2,615, dam, "Augusta," No. 8,192, born 14th February, 1901.

In volume XXVII. of the Friessian Herdbook, it is recorded that "Pel XX." won the 1st prize on 30th August, 1900, at the Lieuwwarden Show in a milking competition, giving 6,627 kilos of milk, 3·50 per cent. fat, and 252 kilos of butter in 300 days.

"Willem," sire of "Pel," won 1st prize at Franska, 17th April, 1900, and 1st prize at Lieuwwarden, June, 1900.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—There comes the pleasing intelligence from all parts of the Colony that it is years since we experienced such abundant rains; in fact, farmers are loud in asserting that we are having one of the old-fashioned seasons, and spring comes dancing along in all her beauty and glory. Although reports come from some parts of the Colony that the average rainfall for October was below the average for the last 25 years, in some districts the rainfall has been quite phenomenal. Now that permits are more plentiful, Natal will soon be denuded of her refugee population, and many merchants are looking forward to a revival of trade when that long-expected event—the opening up of Johannesburg—will have been accomplished.

Mealies.—A few orders have been booked during the past fortnight for up-country, but as the N.G.R. has all its work to cope with ordinary goods traffic and military supplies, permits to forward large parcels of grain are difficult to obtain. The average price per muid during the past fortnight has been from 12s. to 12s. 6d.

Forage.—Some very fair samples have been disposed of lately at prices varying between 6s. and 10s. per 100lbs.

Hay.—From 1s. 3d. to 3s. 10d. per 100lbs; bedding, according to size of load.

Potatoes.—This article is still scarce nothwithstanding the favourable spring, and prices have averaged between 18s. 6d., 23s. 6d., and 29s. per 100lbs. for good table varieties; however, others have been as low as 6s., 9s. 3d. and 10s. 3d. per 100lbs.; sweet potatoes from 1s. 6d. to 3s. 6d. per sack.

Mabele.—From 5s. to 10s. per 100lbs., the former price representing the bastard variety known amongst natives by the name of 'mgeba.

Pumpkins.—From 4s. 5d. to 5s 6d. per doz.

Onions.—From 10s. 3d. to 29s. 3d. per 100lbs.

Beans.—From 7s. 3d. to 15s. per 100lbs.

Butter.—Some samples were as low as 9d. and 10d. per lb.; others realised from 1s. 4d. to 1s. 9d., and 2s. per lb.

Eggs.—The lowest price realised was 9d. per doz., the highest 2s. per doz.

Poultry.—Common fowls from 1s. to 5s. each.; ducks from 4s. 6d to 24s. per pair; turkeys, 16s. 6d. each.

Sundries.—Mutton from 3d. to 1s. 0½d. per lb.; pork from 3d. to 10d per lb.; rabbits from 1s. 9d. to 3s. each; bacon from 4½d. to 10d. per lb.; ham from 7d. to 10½d. per lb.; wheat, 14s. per 100lbs.; fish from 1s. 3d. to 2s. 9d. each, according to size.

Fruit.—Very few varieties offering at present. Bananas, lemons, naartjes, oranges, papaws, and pineapples find ready purchasers.

Vegetables.—Beans, beetroot, cabbages, carrots, lettuce, celery, onions, leeks, tomatoes, and rhubarb disposed of every morning.

Wood.—Some rough stumps sold at 3d. per 100lbs.; firewood from 9d. to 1s. 2d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44 writes:—

General.—Business is somewhat dull of late, and Cape ports are obtaining a large share of the trade with the United States, of which Natal has had almost a monopoly.

Mealies.—The market is very quiet, and though the undercurrent is firm, yet orders are small, while stocks are large. Coast grain is worth 12s. bag; up-country a shilling more.

Forage.—Very fair quantities are now being brought to market, which is a most gratifying sign, and calculated to be worth scores of thousands of pounds to the Colony in the near future. Algerian seed is beyond all question the variety for the farmer, and the bulk of the forage now being reaped is from this particular seed.

Mabele.—About 20s. per bag is being paid to the grower locally, and supplies are small.

Potatoes.—A few new ones are now making an appearance, and from all accounts the prospects are exceedingly good owing to the favourable weather. The market continues to be supplied by importations—mainly from France.

A correspondent thinks the following instance of good jumping by a bullock may be of interest. It is quoted from an Australian paper. A "mob" of bullocks in the cattle yards was being drafted from one pen to another, the dividing partitions of which are 7ft. 6 in. high, when one of the bullocks jumped the partition neatly.

The rabbit section of the New Zealand Department of Agriculture employed in 1899, 44 inspectors, 37 agents, and 5 caretakers of fences, the salaries of whom amounted altogether to £17,000 a year. The total expenses of the Department of Agriculture in that year were £60,000, the larger portion of which was thus distributed:—Experimental stations, £3,000; dairy schools, £1,500; cool storage for dairy produce, £7,000; grading butter, &c., £1,200; collection of statistics, £4,000; inspection of vineyards, £800; compensation for cattle destroyed, £2,000. The total salaries paid that year amounted to £22,600, but that included the pay of 10 vets., 13 clerks and cadets in Wellington, biologists, dairy instructors, fruit inspectors, graders of butter, &c., and many others. £17,000 was the cost of stock inspectors and agents, whilst the sheep rate and fees for registering brands &c., bring in about £20,000 per annum.

The Agricultural Journal

AND MINING RECORD.

VOL. IV. FRIDAY, NOVEMBER 22, 1901. No. 19.

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CONTENTS.

Rinderpest Symptoms.

BY H. WATKINS-PITCHFORD, F.R.C.V.S.

IN view of the approach of rinderpest, and in response to several enquiries lately received as to the appearances of the disease, a short detail of the symptoms will not be out of place, and may possibly help to ensure that promp recognition which means so much in our efforts towards combating this devastating malady.

With the knowledge that rinderpest is actually within the Colony, an increased vigilance will be exercised by the cattle owner, who well recognises from past dearly-bought experience the erratic and sudden manner in which the disease manifests itself in unlooked-for places. What the agencies are by which the disease is disseminated we remain still in ignorance, and it is but rarely that we are able to trace an outbreak of this disease to its source.

Probably the first symptom attracting notice would be one animal in the herd obviously ill, standing with arched back and ruffled coat, moving and feeding in a

listless manner. A closer examination of the beast would a redness of the conjunctiva or mucous-membrane of the eye, with perhaps a slight flow of tears, or dribbling of saliva from the mouth. Upon the temperature being taken the thermometer will register probably 105 to 106 degrees, and this, in the absence of any ostensible cause for so grave a condition, will suggest the necessity for closer observation of all the animals of the herd. Drooping of the ears, purging, and collapse, though suggestive symptoms, should not be waited for before arriving at a provisional diagnosis of rinderpest.

While animals of all ages are falling victims to the disease, younger beasts up to three years old are more likely to become infected. As far as I have been able to observe, previous inoculation with bile of some years ago will not prove of much avail against the present visitation. Animals thoroughly "salted" in the last outbreak are likely to prove immune, or suffer only a temporary indisposition, and those cases having survived an actual attack of the disease, either naturally contracted or artificially introduced, will be likely to remain unaffected in the presence of the contagion. I propose making this interesting and important matter one for investigation at once, in order that I may be able to state more precisely the probable degree of immunity which we may be able to look forward to amongst the animals having passed through the visitation of some years ago.

It is hardly necessary to state that all such cases of sickness should be reported at once, either to the Stock Inspector of the district or direct to the District Veterinary Surgeon, and it is a far safer policy to run the risk of troubling the officers of the Veterinary Department upon a suspicion than it is to waste the first valuable hours of an outbreak, during which so much can be done to check the evil. We heard lately of a case in which the District Veterinary Surgeon rode 120 miles only to find at the end of his journey that he had been called out to confirm the diagnosis of a kafir who had, after the death of a beast, observed some green flies settling on the carcase "like they used to do on rinderpest beasts." The excessive caution of this native is less to be commended in this case, however, than the energy of the District Veterinary Surgeon, whose time could have been more profitably employed.

I propose in the next issue giving a *résumé* of the various methods applicable to the suppression of the disease in the light of our past experience.

Paspalum Dilatatum Propagation.

SEVERAL of the answers received in reply to the questions in the last issue regarding the propagation of *paspalum dilatatum* are disappointing. In one instance the statement is made that, despite favourable conditions and treatment, not a single seed germinated. The most favourable reply comes from Mr. Temple L. Fyvie, Faldon, Fawn Leas. Summarised, he says :—

The seed was sown about the 1st of September in soil that was a specially well prepared mixture of kraal manure, wood ash, leaf mould, and sandy loam. The bed was always kept moist by artificial watering, and the seed took about three weeks to break through the ground. The trial was a great success, as practically every seed germinated. This was only a small lot in a box kept under a verandah and given every possible care. The grass is about two inches high and doing splendidly. Mr. Fyvie further says :— The rest of the seed I planted in very carefully prepared soil in my vegetable garden and naturally rather moist. I planted about four weeks ago, and kept the beds covered with a light dressing of grass. No artificial manuring was given. Three weeks after planting I noticed the seed just breaking through the ground ; I then commenced gradually taking off the grass covering. I think this lot will prove a success, but, of course, it has not come up so well as the lot in the box.

India Rubber from Zululand.

IN October, 1900, and May of the present year samples of india rubber were obtained from the Maputa District of Zululand. The rubber was drawn from the Ibungu tree, a tree which grows all through the district. The samples were forwarded to the Scientific and Technical Department of the Imperial Institute for analysis and report. Professor Wyndham R. Dunstan, the Director of the Department, in the course of his reports, states that the samples were subjected to critical tests and are genuine rubber, but of varying quality. The samples were submitted to commercial experts in rubber for the purpose of determining their value. The best was valued at 3s. 2d. per lb., and the worst at 1s. 11d. Whilst freely giving testimony to the good quality of the rubber, the reports draw attention to the large quantity of extraneous matter in the samples—bits of wood, etc.—which necessarily affected the commercial value of the rubber.

Paspalum Dilatatum.

THIS grass in the several stages of its growth can now be seen at the Botanic Gardens, Durban. All interested would do well if opportunities offered to examine the grass. The accidental paspalum dilatatum discovered by Mr. Medley Wood at Newcastle is also represented, and is identical in every respect with that grown from the recently imported seed. The Gardens will also, as we have said on several occasions, provide many object lessons of profitable interest and information.

District Reports.

BULWER, 11th November.—Rain has fallen almost daily for the last month, and fine weather is wanted to help the crops. The mealies want lots of rain and heat, and in consequence of so much rain are not looking healthy in this District. It seems as though we were never to get rid of the cold weather, as, notwithstanding our being now well into the summer months, visitations of very cold weather are regular. The wheat and rye fields are a beautiful sight just now, being in full ear. I never saw the crops looking better: if appearances have anything to do with them, I should say there should be a record yield. I hear the lambing season has been unsatisfactory, the cold rains causing the deaths of large quantities of lambs all through the Division. As far as I know, all kinds of stock are free from disease and looking well. I need hardly say the grass is good and plentiful. Native labour is rather scarce through all hands being required at their kraals to plough just now; but it will not be for long, as the Natives will have to turn out to earn money to pay their taxes and rents soon. Last Sunday night a light hailstorm passed over the village, but did no harm to the fruit, which is looking very promising.

H. W. Boast, Magistrate.

HOWICK, 19th November.—During the past month there has been amply sufficient rain for all kinds of crops, but not enough to flood the rivers; the total rainfall since the 17th ultimo being 3·30 inches. The maximum temperature during the same period was 92 degs., registered on 11th inst., and the minimum 60 degs. on the 15th inst. Farming operations continue in full swing, and mealie and potato-planting are receiving full attention. Throughout the district the crops are doing exceedingly well, and, should the weather continue as favourable as it has been, both Europeans and

Natives will reap heavy crops. Thanks to the early rains, some of the first crops of potatoes will soon be ready for use. Those who have any for sale have no difficulty in disposing of them at 3d. per lb. The fruit, too, is coming on well there having been no hailstorms up to the present. Sheep-shearing continues apace, and a good yield of wool is expected, as the sheep have continued in good condition since they were last clipped. Milk and butter-making are now at their height, and a ready market for all dairy produce can be found at the Howick Convalescent Depôt and the Natal Creamery. I would again draw the attention of stock-owners and others to the fact that every Native or Indian driving or leading stock must be provided with a printed pass, as per Section 7 of Law 1, 1899, a supply of which passes can always be obtained during office hours at this office, free of charge. People who grant passes by simply writing certain particulars on a piece of paper render themselves liable to a prosecution for issuing improper passes, and may be fined up to £20, or six months' imprisonment, while the unfortunate Native or Indian found in possession of the stock is liable to arrest and similar punishment for removing stock without a proper pass, and the cattle he was driving impounded. Thus, by neglecting to comply with this simple requirement of the Law, granters of passes cause themselves and their servants needless trouble, expense and delay. In future the Police of this Division will prosecute granters of supposed passes who do not comply with the Law in this respect, and they cannot plead ignorance, as a copy of the Act has been supplied to all stock-owners in the Division, through this office. I have pleasure in stating that a trout has lately been seen above the Howick Bridge, estimated to weigh about 1½ lb., which is proof that they are working their way down stream from the Dargle.

J. W. Cross, Magistrate.

INANDA DIVISION, 16th November.—When writing last, on the 29th October, I referred to the immunity of the Division from locusts. I am sorry to have to report now, that within a few days of writing, the Division was invaded by immense swarms, which literally covered the whole face of the country. They are now laying eggs, after which they will, as usual, die off, only shortly to be succeeded by the hatching out hoppers. The Division being under the operation of the Locust Acts, an opportunity will therefore be soon afforded of observing their practical working. Green food being plentiful, the locusts are reported not to have done much harm to crops. The latter are looking well after the favourable rains which have fallen at short intervals. Very large areas of mealies, tobacco, and beans are being put in, principally by Indian farmers. Sugar-planters are complaining of the accumulation of large stocks for want of Railway transport to convey it to market. One planter only to-day informed me that he was at his wits end—as he had an accumulation of 200 tons and all his available store-room space was full, and the mill still running, and enough cane to keep it going for two or three months. This does seem rather puzzling to the uninitated, when seeing empty trucks going towards Durban. The rainfall for October was not heavy probably under the average—but after the heavy rains during September, and almost continuous cool weather, enough fell for all practical purposes, and much cane-planting has been done, which is coming up nicely; and so are the weeds. The following are the main features of the meteorological observations made in Verulam during October: Rainfall, 2.85 inches, which fell on 14 days. The heaviest rain was 0·47 of an inch on the 2nd Maximum temperature in the shade 89 degs. on the 16th and 26th; minimum temperature, 52 degs., on the 11th; mean temperature for month, 68·9 degs. Stock of all kinds continues to thrive, and horse-sickness has not yet made its appearance. The health of the people is also keeping good. I have not heard of much sickness being about this summer, whereas spring is often a time of many ailments.

John L. Knight, Magistrate.

INGWAVUMA, 7th November.—Very cold and drizzling rains were frequent during the greater portion of the month; sufficient to enable the natives to till the soil. We have had only one or two thunderstorms, and they were not heavy ones. The Natives are busy picking the soil, and in many gardens the mealies are from four to five inches in height. What crops are in the ground are doing well. Stock is looking well, both cattle and goats, and also Native—or, rather, Africander—sheep. The latter seem to thrive well upon the range, and it is to be regretted that these useful animals are not more plentiful. The recent outbreak of lungsickness in this Division appears to be dying out. It is to be hoped that by the end of the year this disease will be effectually stamped out. The Stock Inspector (Mr. W. W. Dore) visited the District on the 7th, and remained here for several days. During his stay he granted licenses to the owners of several infected herds, under the Lungsick Acts.

J. M. Hellet, Acting Magistrate.

NEW HANOVER, 18th November.—Since my last report large swarms of locusts have passed over different parts of the Division. The largest swarm, I am informed, passed over Albert Falls a favourite route of their's—doing a great deal of damage to the young crops. This sudden and inopportune arrival of locusts is the more exasperating, as it was quite unexpected after the complete immunity from their ragaves in this Division for some time. There are many instances of quarter-evil amongst cattle.

A. Ritter, Magistrate.

N'KANDHLA, 31st October.—The fall of rain during the month has been slight. The weather has been very changeable; hot, and then very cold, with thick mists. Lungsickness may be said to be still on the decrease, the only fresh cases being outbreaks at the kraals of the Chief Sitehitshili and Jafita, Chief Moses; the

other herds under licenses being G. Hutchinson, Empandbleni, and Sikonyana, Chief Matshana Ra Sitchaguza. The pasturage is very good just now, and all stock is looking well. Mr. J. A. Cooper, Stock Inspector, visited the District on the 17th inst. The planting of crops is very backward this year in consequence of the disturbed state of the District. Along the border little or no cultivation has been done as yet. I fear, unless the season is a good one for late crops, there will be a scarcity of food next year. No locusts have been reported. During the month 875 head of cattle, 142 goats, and 8 young horses were brought into the District by natives of the Transvaal for protection. With the exception of a few cases of dysentery (some of which have proved fatal) the health of the District has been good. One man died of exposure and cold on the Qudeni.

C. C Foxon, Magistrate.

RICHMOND 8th November.—During the last few days a fair amount of rain has fallen, and is still falling, benefiting all farming operations to a great extent. With reference to growing crops—potatoes are looking extremely well, and there is every appearance of their yielding a good harvest. Mealies are only just being planted for the main crop; those which were planted for an early crop are badly infected with grub. With regard to forage, some fields are attacked badly by rust; but those oats known as "Algerian" appear to be fairly rust proof. All stock are doing well and in good condition, though there are occasional cases of gall-sickness and spon-ziekte in the District. At the present time most of the farmers in this neighbourhood are busy shearing sheep. Some large swarms of locusts have passed through the Division lately, but I have not heard that any considerable damage has been done by them.

J. P. Waller, Magistrate.

UBOMBO, 1st November.—The warmth of approaching summer was evident during the past month. In spite, however, of near and distant thunderings and the booming of distant cannon, the rainfall registered was but 1.61 inch. The minimum temperature was 48 deg. and 89 deg. the maximum. Swarms of locusts passed to and from Ingwavuma District and this. It is feared these pests will do more damage this season than last; nevertheless the natives are wide-awake to the fact that planting Kafir-corn in excess of mealies is more beneficial to their interests than the locusts'. Along the coast portion of the District mealies are between one and two feet in height already, and Kafir-corn between six inches and a foot; on the mountainous portion, patches of mealies are also more forward than the mabele. Stock generally remains healthy throughout the District.

A. R. R. Turnbull, Magistrate.

UMZINTO, 8th November.—During the last fortnight it has rained more or less, nearly every day, and in fact the rainfall for the last six weeks has been very great. We have also had frequent heavy thunderstorms, and this one has been, in that respect, more like the old seasons in Natal. The country at present looks fresh and green, and the spring has been the best and earliest, for planting and gardening, that we have had for many years. The sugar-cane looks exceptionally well at present and promises an abundant yield for the coming crushing season. Pasture lands are at present looking well, and stock of all kinds in good condition. No cattle sickness of any kind has been reported for some time. Farmers in the upper Districts are fearing another outbreak of the dreaded rinderpest, though it is to be hoped it may not again extend far into the Colony. Locusts have almost disappeared from the Division at present, though occasional small swarms are seen passing over. Some of the Coast fruit does not promise very well this season, and the mangos in particular have been spoiled a good deal by the rains. This always happens when there are heavy rains during the time the trees are flowering and the fruit forming, and this has been a peculiarly bad season in this respect. Bananas do not suffer in this way, and, consequently, I expect there will be a full crop of summer fruit. The papaw I have never seen in fairer condition nor the fruit in greater perfection. The fruit is very large and of good flavour, and the trees bearing very abundantly. The avocado pears have flowered very badly, but it is impossible yet to tell how they may bear. They are generally prejudicially affected by the high winds which have been prevalent of late, and this also applies to the coast peaches, which I expect will be a poor crop this year. It is rather early yet to express any opinion as to the mealies and other cereal crops, but they look well everywhere.

Jas. McLaurin, Magistrate, Alexandra.

WEENEN, 15th November.—In addition to the rainfall in the village, which registers about 1·25 to date, there have been one or two heavy storms in the District which have not touched the township. A fall of hail on the 6th has caused some damage to the young fruit, and also to the tobacco crop. Orchards are suffering to an increased extent this year from the fruit fly, and no preventive steps to cope with this pest, such as the netting in of the trees, are being taken by the owners. Most of the forage has now been reaped; and, with a few exceptions, the crops are good. Algerian oats are particularly well spoken of by those who have tried them. The Weenen-Middleburg road has now been put into efficient repair, but the other roads in the Division are greatly in need of attention from the Public Works Department. The local Superintendent informs me he is very short-handed at present three of his gangs having been lent to the Military Authorities.

C. G. Jackson, Acting Magistrate.

Mr. Newton, in his "Rural Sports," published in 1867, gave the number of packs of foxhounds in England as fifty-five. There are now 164 packs.

Rinderpest Notices.

THE following Proclamation, dated 15th November, 1901, has been issued :—

Whereas the disease of Rinderpest has broken out in the areas hereinafter defined :

Now, therefore, in virtue of the powers vested in me by the Law No. 13 of 1866, and the Animal Diseases Act of 1894, I, the Governor in Council, do hereby proclaim and make known that the areas respectively defined in the Schedule to this Proclamation shall be deemed to be infected areas within the meaning of the said Law and Act.

And I do hereby forbid the removal from, or introduction into, either of the said areas, or from either of the said areas into the other, of any horned cattle, sheep, or goats, whether the same are or are not affected with any disease.

The penalty for any contravention of this Proclamation shall be a fine not exceeding £50 sterling, with the alternative of imprisonment, with or without hard labour, until the payment of such fine ; such imprisonment not to exceed the term of three months.

This Proclamation shall take effect from the date of promulgation in the *Natal Government Gazette.*

SCHEDULE.

1. The farms "Schoonspruit," "Zuurplaat," "Krantskop," "Bonny Braes," "Mount Plessis" "Doornhoek," "Lisbon," "Kroom Ellenboog," and that portion of Sub-division A of the farm "Zand Spruit" lying south of the main road from Ladysmith to Van Reenen's, all situate in the County of Klip River.

2. The whole of that portion of the Colony north of the Tugela River, but exclusive of the Province of Zululand and of the area No. 1 hereinbefore described.

NOTICE.

Under Government Notice No. 506 of 1901, I hereby grant permission to all owners having Stock in that portion of the Upper Tugela Division, North of the Tugela River, and in that portion of Klip River Division bounded on the South by the Tugela River, on the East and North by the Sunday's River, and on the West and North by the Drakensberg Mountains, to inoculate their cattle with Bile. A Bile Station will be established as soon as possible in the vicinity of Ladysmith. Owners should send to this Bile Station seven per cent. of their cattle, such seven per cent. to be adult cattle and in low condition if possible. Bile will then be issued to them free of charge

Owners not sending in seven per cent. of their cattle will be charged for such bile as the Department can supply. There is only a limited supply of bile at present.

S. B. WOOLLATT,
Principal Veterinary Surgeon.

P.V.S. Office, Pietermaritzburg,
16th November, 1901.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 18th December next :—

Mooi River.—On the farm Waterhoek, black ox, about 3 years old, branded S on right side, no ear marks visible.

Lower Umfolozi. — Chestnut mare, height about 13·3 hands, white blaze, long tail and mane, off hind leg swollen, age about 6 years.

Estcourt.—On the farm Remainder, bay mare, branded G 2 on near leg, off hind foot white.

Ladysmith.—Twenty-four kafir goats, five of which are kapaters, the remainder she goats. Nineteen of the goats are

white, the others grey and red. These goats have various ear marks, six of which have swallow tail in both ears, the remainder with loops and slits.

Dronk Vlei.—A small chestnut stallion, white hind feet, square cut tail, probable value about £4.

The stock impounded as hereunder will be sold, unless previously released, on the 2nd January, 1902 :—

Howick.—Black ox, brauded P right hip, indescribable brand on left quarter, looks like O. Black ox, branded P right hip. White ox, black head and quarters, branded F left hip.

Maritzburg.—Bay mare, branded JS, height about 14 hands, has been mangy, in poor condition.

Howick.—Two red-and-white cows and one black-and white cow, horns turned down, all have two slits in left ear.

Moss Dale.—Dark mare, white star, two nicks in each ear, branded on right hip L3, PU. Brown mare, large white patch on left side of neck, small white patch on right side of neck, front legs white up to the knees, hind feet white, no brands. Light brown mule (mare), branded on right side of neck A. Dark mule, branded on right side of neck KL 70.

Candella.—Dark mare, almost black, about 3 years old, little white star on forehead, white hind fetlock, tail cut square, in low condition.

Estcourt.—On the farm Tintern, of H. Carter, grey colt, 3 years old, branded on the off-side hind leg HE, and piece out of back of right ear.

Greytown.—Chestnut gelding, star on forehead, off front fetlock white, near hind fetlock white ; branded, looks like GN or CN, near hind quarter, age about 3 years. Bay gelding, faint star on forehead, black stripe down back, square-cut tail, age about 4 years, no brands visible.

Ladysmith.—Dun ox, branded on right leg CP, 5 to 6 years old. Black gelding, branded on off leg TO, about 14½ hands high. Bay mare, blaze on face, white off hind foot, near foreleg deformed, long mane and tail, no brands visible. Grey colt foal, small stripe down face, offspring of the above, no brands visible. Grey filly foal, off hind foot white, small stripe on face, no brands visible. Bay mare, off hind foot white, white stripe down face, 2 years old, branded with small O on off hip, long tail and mane. Bay mare, star on forehead, four white feet, long tail and mane, no brands visible.

Acton Homes. — Light-brown mule, branded on right hip JDT. Mouse-coloured mare mule, about 12 months old, indistinct brand on left leg, looks like JG.

Nqutu.—Grey mare, 12½ hands high, branded off hind quarter D and JV, aged. Dark grey gelding, 15 hands, 4 years, no brands or marks.

Howick.—On the 15th of November, 1901, impounded by T. T. Rittson (manager for Mr. Haynes), Loskop, roan stallion, value about £10. Will be sold one month from date unless previously released.

Ladysmith.—On the 13th November, chestnut entire, small star, off hind foot white, height about 13½ hands, about 3 years old. Value about £5. And will be sold one month from date of impounding if not previously released. The impounder claims damages against this horse.

Correspondence.

To the Editor Agricultural Journal.

SIR,—Herewith diseased cutting from a vine bearing for first time : please tell me what to do. I don't know the name of the vine as the labels were lost in transit. Other vines close by (all young) are not affected.

Yours, etc.,

JAMES THORROLD.

Sunday's River.

[The vine cutting submitted by Mr. Thorrold is suffering from a fungus disease known as Anthracnose or Black Spot. It is a well-known disease in most vine growing countries. All the better class of grapes grown in Natal are liable to be attacked by it, and at times the common Catawba and Isabella suffer also. The following remarks are quoted from pp. 141-2 of the First Report of the

Government Entomologist recently published :—

ANTHRACNOSE OF THE GRAPE.

Sphaceloma ampelinum, Sacc.

Anthracnose or Black Spot is one of the most serious diseases affecting the grape in this Colony. It attacks the leaves, the new growth, and the berries with equal virulence. It appears in the form of black spots, which are circular in outline, and which increase in size until they are ¼ to ½ an inch in diameter. As the spots enlarge the centres assume a grey colour, and the attack upon the berry is very characteristic.

Treatment.

After pruning, burn all cuttings and such dead leaves as are found about. Rub off the rough bark and swab at once all parts of the vine thoroughly with a solution of sulphate of iron and sulphuric acid. To prepare this take 20 gallons of water, heat it, and dissolve as much sulphate of iron (green vitriol) as it will take up, then add 16 fluid ounces of sulphuric acid. Great care must be taken in using this, as it is caustic, and will destroy machinery and clothes. Follow this treatment by spraying with Bordeaux mixture once every two or three weeks, commencing before the vines blossom.—[ED., *Ag. Journal.*]

HORSE WORMS.

SIR,—Many thanks for your reply to my enquiry. The worms I refer to are round white worms about three inches long, and seem to be in large numbers.

Yours, etc.,

J. H. COATES.

Native Mission,
Inyoni, Zululand.

[It should not be forgotten that intestinal parasites are generally found in animals in low condition, and the best manner of ridding a horse of these uninvited guests is to improve and maintain in a vigorous state his general condition. The worms described belong to the Nematode class, or round worms proper, so called from the Greek word meaning a thread.

Many remedies exist which are all more or less useful in either causing the expulsion of the parasites of the horse, or act in establishing a condition of the system which proves inimical to the prolonged stay of the worm within the body of its host.

All worm remedies proper are more effective when given after a long fast. For the present case I should suggest one ounce of oil of turpentine mixed in four ounces of linseed oil. Repeat this medicine upon the following day, adding to it 40 grains of calomel and shaking thoroughly before administering. A course of iron tonic medicine will enable the animal to maintain its freedom from these parasites. For this purpose one dozen powders should be obtained, composed as follows :—Powdered gentian, 2 drachms ; sulphate of iron, 2 drachms ; carbonate of soda, 4 drachms. This powder should be sprinkled over the evening feed, and given every other night in this manner until the twelve powders are consumed.

If your correspondent will report progress in, say, a month's time I will see whether I can advise him further.

Animals liable to intestinal parasites should be able to command free access to rock salt at all times.—H. W-P.]

In the course of a lecture on "Manures," delivered by Principal Wright in the Agricultural Hall of the Glasgow Exhibition, the learned Principal summed up by saying that a very good manure for growing potatoes where no farmyard manure was to be got was 6 cwt. superphosphate, 2 cwt. sulphate of ammonia, 1 cwt. of nitrate of soda, and 2 cwt. of sulphate of potash to the acre.

There has recently been much controversy as to which was the largest oak, and many claimants have come forward in support of the merits of their favourite tree. There is good reason to believe that the "Abbot's Oak," standing in Welbeck Park, which has a circumference of 102 feet at its base, has the largest trunk.

The loss of sheep in Queensland has been very great. The decrease in the number of sheep in the Colony since last year has been nearly 5,000,000

In former days, when the bison was plentiful on the North American plains, it was common for men to be left "stranded" if a herd passed their camp upward ; nothing was more terrifying to a horse than his first whiff of the scent or first sight of the great beast, and when thus alarmed, horses broke from their pickets and bolted for miles.

Natal Stud Farm.

INTERVIEW WITH MR. P. D. SIMMONS.

By "ERGATES."

THE "Natal Stud Farm" and the owner, Mr. P. D. Simmons, are well-known to most stock farmers in Natal and to many beyond. This fact is due not only to the class and quality of the stock of the farm, but to Mr. Simmons' enterprise and success as a show exhibitor. The risks, worry, hard work, and cost which deter many from exhibiting are ignored by Mr. Simmons, and competing animals of his have for years been found at every accessible show, big and little—Durban, Pretoria, Johannesburg, Harrismith, Maritzburg, Ladysmith, Dundee, Estcourt, Howick, etc. As one who shows typical animals of high class he is a public benefactor, and all will readily admit that his show honours, some very substantial in character, are deservedly earned in every respect.

Mr. Simmons began farming some 15 years ago, having purchased the farm, Bray Hill, of the late Mr. Wm. Popham. The farm is situated about six miles from the Mooi River railway station, and extends from the south-west sides of the range of high hills running from Brynbella to Hlatikulu, and down to the river on land formerly owned by Mr. H. Ryle Shaw. By extensive planting of wattle tree belts as wind breaks and for ornament, the general aspect of the farm has been changed almost beyond recognition. When I made my visit the grass was at its greenest, and the wattles of the miles of strips were covered with the beautiful blossom of which Lindsay Gordon so rapturously sings Of course the homestead is much enlarged. On entering there are two big barns with a covered wagon way between, and of loose horse boxes—all big, well lighted, well ventilated, and fitted with modern manger arrangements—there are no fewer than sixteen.

CATTLE.

"What, I asked, made you go in for Shorthorns? You did not start with them if I remember rightly."

"No, I began with Frieslands, but I came to the conclusion they were too soft, and I found that the large white patches on their skins were subject to scab in the winter months. Thinking over the question of breed, I argued in this manner: The Shorthorn is the most favoured of all breeds throughout the world, and the breeds doing best all round in this part of the country being the Shorthorn, it stands to reason that that will be the best breed for me to adopt. In 1888 I considered Mr. Wm. Wood's Shorthorns to be the best troop of cattle in the country. Having arrived at this decision I sent my cows to the best available Shorthorn bulls. My view was a good deal encouraged by a purchase I made at this time. Mr. Theodore Woods was selling off his cattle, and his cows were made into three lots: the first at £25, second at £15, and third at £7. One that I considered the best in the troop was in the second or £15 lot, and I bought her. I showed her in Estcourt and got the first prize of £5, and her first calf I sold for £10. She had now paid for herself. Her next calf I sold for £25, and others of her family were sold at prices from £25 and £45. The one sold at £45 brought me also the Milking Championship prize at Durban of 15 gns., and I reserved the right of her next calf, which was to be delivered free at Mooi River station. After nine years breeding from the old original cow, I had her sold at the Durban market, where she fetched 15 gns. She had not a tooth in her head, but on bran and soft food she even then was a first-class milker. Altogether this £15 cow brought me in prizes and cash £168, and among the best of my stock are her descendants."

"When did you begin importing?"

"In 1891 I imported Viscount Oxford XVI., and since then Master Mid Kent, King Creake XIII., Rose Drake, Captain Loftus, Clarence, Pendeen, Farmer's Hope, and others. Most have been exhibited,

and have taken Championships at Johannesberg, Pretoria, Maritzburg, Durban, and at the local Shows. From most of the importers of Shorthorns I have bought cows, and these cows, mated with my own bulls, have founded my present herd."

"What class of Shorthorn do you favour?"

"General utility, and in shape cobby. In colour I make dark red a speciality, and I aim at having short hair and a thick skin. I have found my herd as hardy as any other herd of whatever class. This will give a notion of their hardiness. The main part of the herd winter at my farm under the Berg, near Giant's Castle. Six years ago the kafir chief Philip, with a much larger run of similar ground near by, lost seventy head, whereas I did not lose any. Here is another example of their hardiness compared with the ordinary cattle of the country. Of these, a few years ago I bought 200, and while wintering with my Shorthorns they died heavily. In two years I got rid of the whole lot as unprofitable. Once I walked the stock for show to Greytown, a distance of sixty miles. They were three days travelling. There were eight head of cattle, including the imported bull Master Mid Kent. They arrived in fit condition, and took the challenge cup for the best group of cattle on the show. I often ask people to come here at what they consider the worst time of the year to look at the herd. I find Shorthorns regular breeders, sometimes having twins, and far above the average as milkers. The high quality of the milk can be proved at the Mooi River Creamery, where the milk I, and all others, supply is regularly tested. All the cows I sell for dairy purposes are perfectly docile and trained to eat out of the manger. Many of them, also, are trained to be milked without their calves."

"Do you believe in hand-rearing the calves?"

"Certainly, if there is any market for the milk. If there were a demand I would rear every calf by hand, and I could easily supply from 150 gallons to 200 gallons a day throughout the year. I could, of course, sell cream for butter-making, but taking everything into consideration, more especially the fact that my chief business is in bulls, I think it best to let the calves have the milk beyond that required at the Creamery. I have over 80 at present and another 40 are expected. Calving here is practically all right all the year round. There is only one month that should be avoided—February. The calves of that month belong to neither summer nor winter, and are bad doers. During the hot days of the summer months my calves go into the gum tree plantation you have seen. It is always cool there, however hot the sun or the north wind may be. All my calves which I consider are not up to the standard for bulls are castrated, and are sold at from 9 to 12 months old. There is now a regular trade in them, most of them being purchased for reselling to natives at very considerably increased prices. I arrange that heifers of the best milk strain shall calve down at from $2\frac{1}{2}$ to 3 years old. As to milking, I am almost inclined to say that the milk cow is as much made by training and treatment as by the breeding. From the very first the milking ought to be made a pleasure and relief to the cow. All my heifers are milked by my most skilled kafir, who is exceptionally patient, gentle, and kindly in his treatment of them. For softening the teats I use fresh lard. It is commonly used throughout England, and I have found it serve admirably; vaseline, however, is now being used by many in preference."

"Do you prefer kafirs to coolies for milking?"

"So far as my personal experience goes I can say, certainly kafirs as a rule. I have, however, two or three coolies who have the necessary sympathetic temperament, and without that no dairy work can be properly done."

"You aerate the milk?"

"Of course. One boy is constantly collecting the milk from the milkers as soon as it is drawn, and taking it away from the byre to the aerator, which is cooled with water led in underground piping from a cold spring in the kloof."

"And about feeding?"

"In summer the milk cows run like the rest of the herd on the veld only. Of course if there was any demand for milk I should give them some supplemental milk-producing food. In winter I give brewer's grains and crushed mealies, boiled and given warm; also roots, cab-

bages, or ensilage, and a liberal supply of veld hay. Cabbages are my favourite food for cattle. The hay is sprinkled with treacle and water. Ground-nut cake, I may add, is excellent for milking on, but it must be used fresh ; if kept too long it becomes rancid and injurious. Last winter I kept my calves here on clover hay—all grown here."

"How did you come through the rinderpest ?"

"Well. Here I lost only 3½ per cent., though in the Berg troop the losses were 8 per cent. Like others, I first inoculated uselessly with clear bile while the cattle were still clean. When the disease broke out I used serum, but the prescribed treatment I modified slightly. I did not mob the cattle and treat them wholesale, but picked them out on the veld as soon as they showed the first symptoms of disease. The virulent blood I used I did not take from the worst cases of 106 to 107, but from animals at 104 to 104½. The serum was injected 24 hours afterwards, and again daily when considered necessary. The treatment of the cattle in small lots prolonged the work, but as all my cattle are quiet to handle, the advantages I believe I gained did not cause any appreciable extra trouble. The drink of all animals under treatment was thin oatmeal gruel."

"And about common cattle diseases ?"

"Happily, this district is very free from cattle disease. Quarter-evil, which is now bad in many parts of the Colony, I don't know here. As you have noticed, the byre is kept in a thoroughly clean state, and the lime washing is frequent. I am lavish in lime washing and the use of lime. Besides destroying any germs of disease that might be lurking where it is used, it all comes back to the cattle either directly or through the food which has taken up the lime which has been rubbed off the walls and swept from the floors and has got into the yard manure. The cattle also get lime in their water and in their licks. Plenty of disinfectants are used. Cases of scours among calves are immediately attended to. The remedy I use is a simple one—suet and milk. It is an old Yorkshire remedy, and one that often proves effective in cases of human beings suffering from dysentery when drugs have failed. For a calf a lump of suet about the size of a walnut is ground up fine with a kitchen grater, and it is boiled in the dam's own milk. It is given cool. The effect is probably chiefly mechanical in giving a smooth coating to the intestines. One or perhaps two doses nearly always brings about a cure. If the calf should be looking seedy and not thriving, I give a preliminary dose of castor oil."

HORSES.

"Previous to the war," Mr. Simmons said, "I did a large stud business with the public, having large and small thoroughbreds, hackneys, Clydesdales, ponies, and general purpose sires. Arcano, the present thoroughbred, is the best I have imported. He has a marvellous constitution, great power, and good bone. He is the most muscular thoroughbred I have ever seen in my life. To make sure that the Boers should not get him I sent him before the Boers came into the district to Durban, where he remained four months. I make a great point of giving all my horses plenty of lime—both in their drinking water and in their licks. The loose boxes are kept chiefly for mares sent by the public. I firmly believe in keeping the brood mares running out and foaling out—carefully selecting the ground. During June, July, and August they go on the cultivated grasses. The general troop run on the veld, most of them going to the Berg farm in the winter. Pony and cob breeding from blood sires is my speciality in horses, and for this purpose I use some fifty selected mares—all, with one or two exceptions, selected since the Boer invasion of this district."

What Mr. Simmons told me about his Shropshire sheep, imported grasses, and other features of his farm will appear in the next issue.

The loss through using large brands and placing them on the most valuable parts of the hide is estimated by the Sydney hide dealers at £150,000 per annum.

The British Consul-General at Marseilles hears that "a new fatty substance, for consumption in the United Kingdom, to take the place of butter, is being put on the British market. It is called vegetaline, and is nothing else than the oil extracted from copra (dried cocoanut), refined, and with all smell and taste neutralised by a patented process. It becomes like sweet lard, and is intended to compete with margarine on the breakfast table as a substitute for butter."

Potatoes in Hot Climates.

SAYS the "Jamaica Journal of Agriculture":—A crop of six tons of "Irish" potatoes removed from the soil in a series of experiments, the following quantities of fertilizing materials, nitrogen, 96lbs.; phosphorus, 22lbs.; potash, 170lbs. This shows plainly the necessity of preparing the ground for every crop with a liberal manuring; even when manure is used largely, it is the best practice not to use the same ground in succession. In the north potatoes do best on a clover soil; here, in the south, we can follow peas with potatoes, when we should have good body in the soil and require little or no nitrogen in our manures. This is a commendable practice where bulky manures, like stable and pen manure or cane trash, are not available. The man who intends planting potatoes in October or November should clear his land now; if he has already done so all the better. If he planted peas—Cockle's Increase, Cow Peas., etc., as before mentioned on the land intended for potato planting, and which make plenty of bush, now when the crop has been reaped the vines should be ploughed or forked in; the Cockle's Increase does not die down after one crop, but goes on growing, therefore gives a good heavy dressing. The rains of October will thoroughly beat down the clods and fine the soil, and sinking in the soft earth, a good store of moisture will be laid up below, to be drawn upon in case of any dry weather continuing later on in districts inclined to be very dry like the lowlands of the south-side. We notice in the reports of the potato experiments carried through last season, that wood-ashes were largely used by some growers, and that because of the dry weather they remained quite undissolved in the soil. Even though plenty of rain had fallen, this would have been the case to some extent if the ashes were fresh. Their action is very slow, but their effect lasts for several seasons. The best use to make of wood-ashes intended primarily as fetilizer for a potato crop, is to use them for the preceding season's crop. To be of use directly to potatoes, the ashes should be stored under shelter (if exposed much to rain, they would leach and lose much of their potash), then they absorb some moisture from the atmosphere, and also an appreciable quantity of nitrogen. Half an Imperial ton of wood-ashes or 1,120lbs. per acre would give something like 22lbs. of phosphoric acid per acre, and anything from 100 to 170lbs. of potash. The peas would feed vigorously and luxuriously on these two fertilising elements, which are just what peas and beans want. When peas are turned in all the potash and phosphoric acid of the wood-ashes would still be in the soil, together with an appreciable quantity of potash drawn from the sub-soil, and the peas would have added 100lbs. of nitrogen per acre, drawn mostly from the air. Now to get 100lbs. of pure nitrogen from our artificial fertilizer containing 10 per cent. would take a ton, and would cost £10 a ton, for 10 per cent. is a large proportion. The soil would thus be in fine condition for potatoes. In the spring when the potatoes were lifted and the soil left fine and friable, corn could be planted without any additional manure except another application of wood-ash, and grown with very little cultivation, with peas between the rows. If the corn stalks and the pea vines were ploughed into the soil in September, the land would again be in a fit condition for potatoes in October or November. The native rotation of corn and peas and potatoes is a good one, and suits a potato grower whether he is in the lowlands and only grows a winter crop, or in the hills and may grow potatoes the year round. In the latter case two separate pieces of ground may be used and planted with potatoes alternately; in the intervening period the ground should be planted to corn and peas. Immediately the October rains are over, the drills should be made, two or three feet apart, and the potatoes planted nine to twelve inches apart. Some varieties of potatoes tried here grow very little top, and so may be planted close, while vigorous sorts, like the "Scottish Triumph" and "Red Bliss Triumph," which have plenty of haulm, should be planted at the wider distances. Potatoes will stand heavy doses of manure, whether from horses, cattle or pigs, and will also

benefit by applications of artificial fertilizers. In all cases it is better not to apply manures or fertilizers in direct contact with the seed. The animal manure should be dug in previous to planting, the artificial may be applied either before or after planting, or both before and after. The potato drills should be made deep enough that the potato sets may be covered to the depth of three or four inches. When the shoots appear, and have grown to three or four inches above the soil, they may be hilled up a little, and if they grow up high, hilled a second time. Much hilling is not desirable in any but very wet places. The weeds ought to be scrupulously kept down.

Agricultural Chemistry for Beginners.

CHAPTER I.

By Archibald Pearce.

IT is quite true, as Mr. Thorrold so feelingly laments in his letter of October 13th, that to a layman chemistry is as bad as Greek ; and yet, like most other things, its difficulties vanish when it is understood. It is no very serious task to grasp so much of the elements of the subject as will enable one to take an intelligent interest in such semi-technical writings as ordinarily appear in agricultural literature, and I propose to write a series of short articles on the subject of Agricultural Chemistry, with the hope of affording some assistance to those who regret the absence of a scientific education. It will, throughout, be my aim to write plainly and avoid technicalities as much as possible ; to limit the articles chiefly to that branch of the subject which is concerned with fertilizers and soils ; and to introduce only so much theory as is necessary for clear explanation. In two matters I must beg the reader's indulgence; first, that he should follow the series from the beginning, as the various chemical terms used will be explained as they occur, and not a second time ; and, secondly, for my own deficiencies, of which I am only too well aware. There is so much that might be said that a choice becomes difficult, and my choice may not always be the best ; but I shall use my best discretion.

In treating a new subject of whatever kind it is usual to carefully define some of the new terms to be used. To commence with, chemistry is essentially the study of Elements and their Compounds.

Elements.

An element is a substance which no one has yet succeeded in breaking up into two or more simpler substances, or, in other words, which is composed of one kind of matter only. It is not impossible that some things now called elements may be eventually so divided, but until this happens they are considered to be indivisible substances. Elements are, so to speak, the bricks of which all other known substances are built up. There are between 70 and 80 known, some of them quite rare ; those that will chiefly concern us are :—Oxygen, Hydrogen, Nitrogen, Chlorine, Carbon, Phosphorus, Sulphur, Silicon, Calcium, Iron, Aluminium, Potassium, Sodium, and Magnesium. The last six are metals, the rest non-metals. All other substances are formed by the combination of various elements in various proportions, and substances of this kind are known as compounds.

Compounds.

It is essential to grasp the chemical meaning of this word ; the elements which form a compound are so united together, and held in combination by a force called chemical attraction or affinity, that they cannot be separated by merely mechanical means. A simple experiment will make this clearer. If we take a little powdered sulphur, and grind it up with about twice its weight of iron filings, we shall see the particles of iron and sulphur lying side by side, and could wash away all the sulphur from the iron, or separate

the iron by plunging a magnet into the mass, to which the filings will cling. Here we have a mere mixture, and no compound is formed. But if we now heat the mixture rather strongly a sort of glow will spread through the mass; a black substance will be formed in which no particles of either iron or sulphur will be visible, and upon which a magnet has no effect. Combination has taken place under the influence of heat; a compound of iron and sulphur, called iron sulphide, has been formed, entirely different in its properties from both iron and sulphur. Mixtures differ from compounds in another important particular; one can mix substances together in any proportion one pleases, but compounds always consist of the same elements united in the same proportions. For instance, in our experiment above, if we used exactly the proper proportions, viz., 32 parts by weight of sulphur to 56 of iron, there would be no iron or sulphur left as such, but 88 parts of iron sulphide instead. If, however, we had taken, say, 60 parts of iron, there would still be only 88 parts of iron sulphide formed, the other 4 parts of iron remaining unaltered. It is this law of constant composition that enables the analyst to state definitely the quantities of various elements contained in their compounds.

No Destruction.

Another important principle is that all matter is incapable of being destroyed. We can change its form, or make it disappear from view, but it still exists in some form or other, and by suitable means can be completely accounted for. When a candle burns, it disappears; it vanishes entirely, and in common language it has been destroyed. But this is not true in reality; the constituents of the candle have been undergoing combination with a part of the air, and the products formed are in the form of gases and invisible, which by proper means can be absorbed and weighed, and are found to actually weigh more than the original candle, the increase being due to that part of the air which has helped to form the new products.

(*To be continued.*)

In-breeding.

ITS USE TO THE POULTRY KEEPER.

THIS, says "R. G." in "Farmer and Stockbreeder," is a subject of considerable interest to poultry breeders, but one which is very littte understood. Nothing is more common than to read wholesale denunciations of the system from the pens of amateur poultry-keepers, and many others who have not even a superficial knowledge of the subject, but who like to air their views on that or any other subject if they can only get people to listen to them. The experienced breeder knows how wrong such ideas are, but seldom takes the trouble to confute them.

To what class of poultry-breeders is in-breeding of most service? To the fancier, undoubtedly. Without its aid he would never know what results he should expect from any mating, and the result of many a season's breeding would be unsatisfactory in the extreme. At great expense he might have got a beautiful pen of birds together, with a typical unrelated male at the head of it; just such a pen as most people would say ought to breed a preponderance of first-class stock, and yet, at the end of the season, he would be amazed as well as disappointed to find that not 5 per cent. of the produce were fit for the show-pen. On the other hand, had the male bird stood in the relation of, say, nephew to the hens, and he had been well bred on the other side, there would probably not have been more than 10 per cent. of real rubbish in the whole progeny. We do not mean to say that the whole of the remainder would have been fit for the show-pen, but a very satisfactory proportion of them might reasonably be expected to be so, and the balance fit for the breeding pen or for sale as breeding-stock at more or less remunerative prices.

Not Practical in all Circumstances.

It is not possible to practise in-breeding successfully under all circumstances. It would be great folly to in-breed birds whose constitutions were defective in any particular whatever, and it would be a great waste of time to in-breed birds which had any marked external fault. For we must remember that although in-breeding when judiciously used can be made to intensify all the good points of a fowl, it also intensifies all the bad ones, too. If a hen is of sound constitution, is a very good specimen of her breed, with no very marked fault about her, she may be safely mated with a related male equally sound, and especially if he has points which counterbalance any little external faults she has, and *vice versâ*; for we must remember there is nothing absolutely perfect in any domain of stock-breeding. From such a mating strong, vigorous birds will result, some of them probably better than their parents, and most of them very typical of their breed, just such a flock as the fancier loves to possess. Particularly in well-established breeds will this be the case, although we must look for something not quite so good in the later introductions which have not yet had time to settle into a fixed type. Without in-breeding the propagation of new breeds is hopeless, with its aid the work is uphill for a long time, but every year bringing the marks of a new race into bolder prominence, until the general type stands out clear and distinct, and capable of reproducing itself for all future time.

Even in breeds which have been established for forty years or more the union of totally unrelated birds often produces in the first season almost worthless offspring from a standard point of view. But if the best of such progeny is mated back again to the parents, the pullets to the sire and a cockerel to the old hens, the difference is at once surprising. A large proportion of the progeny from either of these matings is most satisfactory, and if the same thing is continued for another season, or for another two for the matter of that, still better results are obtained.

How far can it be Practised?

How far can in-breeding be safely practised with stock of originally sound constitution? We doubt if anyone living can answer that question. For ourselves, and chiefly as an experiment, we carried it on without a single break, and from very close relations, for five years, and at the end of that time our stock was as large, as healthy, as fertile, and as prolific as they were the first season. We then dispersed the breed on which we tested it thus far, although on other breeds we have often practised it, although never for so long a period without a break. We do not for a moment advocate the breeding of close relations for such a period without the introduction of a single drop of fresh blood; we repeat, we deliberately did it as an experiment, in order to practically test the outcome of prolonged in-breeding on the progeny of a well-selected pair of healthy birds.

Probably there are few, if any, fanciers of note who do not owe their success very largely to a system of scientific in-breeding. One well-known judge once told us that so-and-so (a prominent breeder of modern Game fowls) had casually mentioned to him that he was thinking of introducing a little fresh blood the following season into his strain, "as he had not done so for the previous seven years." His strain was almost world famous.

Long ago, when cockfighting was a legal sport, many strains were so carefully guarded, and the dread of deterioration from alien blood was so great, that some remained uncrossed for over twenty years.

In other Realms of Nature

the closest in-breeding prevails. Among freshwater fish it is universal; birds of almost every species, the wild deer, game of all kinds, the wild horses of the plains of South America, and we have no doubt hordes of savage animals, all live under this law. Finally, we must all admit that the abominable rodent known as the rat is a most prolific animal. We doubt if in all creation there is any animal which lives and breeds so incestuously as the rat. If in-breeding was an unmitigated evil, it would soon disappear off the face of the earth, but we all know whether it is likely to do that or not.

Again, all our best strains of cattle, horses, sheep, and dogs have been brought to a high pitch of excellency by a judicious system of in-breeding.

To the utility breeder of fowls, is the system of much use? It is useful, certainly, even to him; but as he has little inclination, as a rule, to treat the subject scientifically, he is safer to let it alone. It comes in useful this way: if a man has brought out a specially good laying strain and does not know very well where to get a male bird from an equally good strain to keep up the quality of his birds, his best plan is to acquire a hen with the reputation of being a first-class layer, cross her with one of his own cockerels, and retain the males produced as breeders with his own flock for future seasons. This will keep up laying qualities with far greater certainty than introducing a chance cock from another strain, with no positive knowledge of what he is likely to do.

Banana Fibre.

ABOUT a year ago we ("Queensland Agricultural Journal") received a sample of banana fibre from the Cairns district. It struck us that it would be well to obtain a valuation of it from some firm in London engaged in the fibre trade. The sample was, therefore, sent to a gentleman in London, who now forwards a report upon it by Messrs. Henry Devitt and Co., Mincing Lane, London.

The brokers say:—"We have carefully examined the sample of hemp from Queensland; it is Manila character, good strong fibre, but mixed lengths, some very short; value, about £25 per ton. We should, no doubt, be able to find an outlet, and would recommend a trial shipment."

The Manila hemp of commerce is derived from the plant known as *Musa textilis*, but all the plantains and bananas yield an excellent fibre, especially *Musa paradisiaca*. Most people in Queensland know how easily bananas and plantains grow in this State. They are found in vast quantities in the Northern scrubs. These wild bananas produce a small fruit full of seeds. When cultivated, these seeds eventually disappear. Bananas require very little care, and on the rich coast lands throw up an abundance of stalks from the rhizomes. The height of *Musa textilis* varies from 12 to 30 feet, and at three years of age it begins to flower. As soon as the flower is out, the plant is cut down and the sheathing stalks are torn into strips, the outside sheaths being kept distinct from the inner ones. The outside ones produce a strong fibre of great durability and strain-resisting power. This fibre is used for cordage. The inner fibre is fine and weak, and is used by the natives for weaving fine, almost transparent, yet fairly strong dress material. A Manila native merely cuts down the plant, shreds it, and then scrapes off the soft cellular matter, after which he hangs it up to dry, and no further treatment is necessary. He can produce 25lb. weight of fibre per day in his lazy fashion, each stalk yielding 1 lb. of fibre. By the employment of suitable machinery the work of cleaning the fibre is very rapidly performed.

Six hundred thousand seven hundred and thirty-eight bales of hemp were exported from the Philippine Islands in 1889, equal to 1,201,476 piculs, or 71,337 tons. At the price quoted by our correspondent—£25 per ton—this represents a value of £1,813,425. There seems no reason why Queensland should not capture some of this trade.

The Melbourne "Argus" mentions that "the indifferent results obtained on some of the Queensland sugar plantations this season may lead to their abandonment if purchasers cannot be found for them."

A remarkable fatality is reported from Shelbyville, United States America. The youngest son of a farmer, an old thoroughbred mare, and her foal were great friends. The boy was four years of age, and it was his custom to play daily with the foal, which would come to him when he called it. One day he was bending down wrestling with the foal, when the mare became suddenly enraged, and attacking the boy with teeth and hoofs killed him almost immediately.

Garden Notes for November.

By W. J. Bell, Florist and Seedsman.

KITCHEN Garden.—The main crop of celery should be sown early this month in a well-prepared bed thoroughly well sheltered from north winds. Immediately the seed is sown the bed should be covered with a layer of light litter, which should not be removed till the seedlings appear, and then only gradually as the young plants become stronger.

While germination is taking place, and for some time after the seedlings are through, the surface of the bed should be kept continually moist by watering both morning and evening, as in hot weather one watering is not sufficient, and special care and attention will be required for at least two months after sowing.

The best varieties are Coles Crystal White, Giant Solid White, White Plume, Major Clark's Red, and Giant Solid Red.

This month is the best time for sowing leeks.

A thorough preparation of the ground is necessary as the leek luxuriates in the richest of soils.

The finest specimens are produced in shallow trenches dug out and manured as for celery. Here the seedling leeks are planted in single or double rows. By this means the roots are kept cool during the most arid and hot weather, whilst water can be applied more directly. The seed may be sown in a bed either in drills or broadcast, and require similar care and treatment to celery until they are large enough to be transplanted into the trenches.

They may be blanched by drawing the soil up round the stems in the same way as celery.

The first sowing of Cauliflower may be made this month for the early crop.

The seed should be sown broadcast in a well-prepared bed in which a little lime has been added.

The young seedling plants, when large enough to be handled, should be pricked out into another bed similarly prepared a few inches apart each way, with just sufficient space to allow of a ball of soil being lifted with each plant when large enough to plant out.

This plan is much preferable to planting out direct from the seed bed, as the young plants will be stronger and can be transplanted with less risk.

The best varieties are Early London, Early Erfurt, and Veitch's Autumn Giant. The latter variety has been grown to an enormous size in this country, specimens having scaled 24 lbs. weight.

Sow for succession Dwarf Beans: Canadian Wonder, Golden Butter, and Burpees green podded stringless are the best; also Beet, Cabbage, Raddish, Lettuce, Tomato, Vegetable Marrow, Parsley, Thyme, Sage, Marjorm, and other pot-herbs.

Capiscum and Egg-plant may still be sown in the Midland and Coast Districts.

Where live fences are required, now is the time to plant, such as Thuja, Japan Privet, and Eugenia. A trench should be dug out and filled in with nice light rich soil, but fresh manure must not be used, and none at all for Thujas. For fences plant fifteen inches to half a yard apart.

Flower Garden.—All varieties of tender and half hardy flower seeds may be sown now, including Asters, Margaret Carnation, Cosmos, Cockscomb, Balsam, Sunflower, Heliotrope, Ipomea, Marigold, Nasturtium, and Zinnia.

The Margaret Carnation and Cosmos sown now will flower in the autumn. In the colder districts many of the hardy flower seeds may be sown for autumn flowering, such as Antirrhinum, Candytuft, Calendula, Coreopsis, Cyanus, Dianthus, Gaillardia, Larkspur, Linum, Mignonette, Petunia, Phlox, etc.

Advantage should be taken of the wet weather for planting all kinds of evergreen flowering shrubs and ornamental trees.

The planting out of all kinds of summer and autumn flowering perennials should be completed as soon as possible,

such as Achillea, Anemone Japonica, Cannas, Carnations, Cuphea, Coreopsis lanceolata, Daturas, Gaillardia Perennis, Geraniums, Heliotropes, Hydrangeas, Hypericum, Lilies, Pentstemons, Salvias, Streptosolen, Phlox decussata, Pelargoniums, etc. The borders should be well prepared by digging and manuring. All the decayed vegetable refuse from the garden should be forked in, and in addition a good dressing of bone dust, which is one of the best fertilizers for a permanent border.

Mealie Trials at Balgowan.

By BRUCE HUTCHINSON.

MR. BRUCE HUTCHINSON, of Messrs. G. and B. Hutchinson, Boschfontein, Balgowan, is good enough to send the following full and interesting account of experiments with various fertilisers in mealie culture made last year –1900-1901.

Seed: Yellow horse tooth. Planted in squares 3 feet apart each way. Two plants in each hill. Land in thoroughly good cultivation; plots one-fifth of an acre each. Planted November 23rd-24th, 1900. After cultivation—with weeder, November 27th and December 11th, 1900; with scuffler, December 25th, 1900, and January 19th, 1901; thinned by hand, January 15th, 1901; reaped, July, 1901; shelled, November, 1901.

Plot.	Fertiliser.	Quantity per Acre sown in drills.	Bad Mealies estimated.	Crop per Acre—Good Mealies lbs.		muids.	lbs.
No. 1.	None	...	½ muid	2,785	=	14	41
No. 2.	Thomas Phosphate	5 cwt.	1 „	3,145	=	16	9
No. 3.	Natural Bird Island Guano Sulphate of Ammonia Muriate of Potash	4 „ 1 „ ½ „	1 „	2,960	=	15	20
No. 4.	Natural Bird Island Guano Muriate of Potash	4 „ ½ „	1½ „	2,750	=	14	6
No. 5.	Natural Bird Island Guano	4 „	1 „	2,970	=	15	30
No. 6	Bone Dust Sulphate of Ammonia Muriate of Potash	5 „ 1 „ ½ „	...	2,900	=	14	156
No. 7.	Bone Dust Muriate of Potash	5 „ ½ „	1½ „	2,430	=	12	78
No. 8.	Bone Dust	5 „	...	2,700	=	13	152
No. 9.	Bone Dust Thomas Phosphate Muriate of Potash	3 „ 4 „ ½ „	...	3,420	=	17	88

The bad mealies were not shelled and weighed, being absolutely useless; the quantity was estimated from the quantity of bad cobs, and will be practically correct. The weights given are good shelled mealies and thoroughly dry.

It is rather difficult to see why there should have been a comparatively large quantity of bad mealies on some plots and none on others. It does not appear to have been caused by any one particular kind of fertiliser. The cobs went bad on the stalks. The bulk of the crop was a very good sample of grain, which makes it harder still to account for the bad cobs every here and there.

To ensure accurate returns, the plots were made rather larger than one-fifth of an acre, and at reaping time every plot was counted to 968 squares, all surplus squares being taken off the ends of rows. Also between each plot – which consisted of six to eight rows—one row was left before commencing next trial plot, otherwise the mealies in outside rows of each plot would have their roots running into the fertiliser in adjoining plot. All surplus squares not counted in trial plots were reaped and removed before commencing reaping the trials.

These trials were made on, comparatively speaking, new land, it having been

cropped only twice previously. In 1899-1900 it was in mealies, fertilised with 4 cwt. Thomas Phosphate per acre, yielding a crop of 15 muids per acre. In 1898 99, the first year it was cropped, it was sown with winter oats, fertilised with 4 cwt. bone dust per acre, and subsequently with top dressing of about 3½ cwt. Kainit per acre. This crop failed entirely owing to rust.

The land being very poor it is very doubtful whether it would ever have given more than 5 or 6 muids of mealies per acre without fertiliser, and judging from other lands of the same class it would only have done this for a year or two, and then have got down to 2 or 3 muids per acre. At any rate this was our experience years ago before we commenced using any artificial fertilisers.

The heavy crops grown can therefore be taken as solely due to the use of artifical fertilisers and reasonably good cultivation.

The very satisfactory return of over 14 muids per acre from the plot with no fertiliser shows that Thomas Phosphate (being the fertiliser used previous season) must improve the land very considerably for more than one season. This is a point of great interest, as it has been frequently suggested by mealie growers that possibly Thomas Phosphate would leave very little in the land after the current season. In this case it would certainly appear to have improved the land very considerably, in fact it would seem to have had almost as much effect the second season as the first.

On the whole Thomas Phosphate is the most profitable of all the fertilisers used in these trials, being the cheapest and giving the best results.

Plot No. 9 gives the highest yield, but the cost of fertiliser was far more expensive than in plot No. 2, where only Thomas' Phosphate was used; and the latter plot would have given nearly an equal yield if the bad mealies were included. These bad mealies, it must be remembered, do not appear to have been caused by the fertiliser.

It is rather hard to understand why Muriate of Potash and Sulphate of Ammonia do not produce any results on the yield. Corn crops are usually supposed to require a certain quantity of potash and nitrogen in the fertiliser as well as phosphoric acid. But on this soil the phosphatic fertilisers are the only ones which show any appreciable results. No doubt the good results obtained by using Thomas Phosphate are partly due to the quantity of lime it contains.

The results from bone dust are very strange—it has not only done no good but has been positively harmful. In previous years bone dust invariably gave good results on our soil, in fact better results than any fertiliser we have ever used, excepting Thomas Phosphate.

The bone dust used in these trials was imported from Australia, and evidently there was something in it which is decidedly harmful, but what it is we cannot find out. It has been analysed, but the analysis does not show anything harmful.

Plot No. 8, on which bone dust alone was used, looked as if it would be a total failure when the mealies were small; they were yellow and sickly and looked like dying, but recovered as they got older, and eventually gave a fair crop, but not so good as the plot with no fertiliser.

This cannot be taken as a fair trial of what good bone dnst could do, as undoubtedly there was something wrong with this particular lot.

Three years ago we tried bone dust (Colonial) against Thomas Phosphate for mealies., 4 cwt. per acre of each. It was on a piece of land that had been very heavily fertilised for potatoes the previous season. The results were :—For bone dust, 14½ muids mealies per acre; and for Thomas Phosphate, 15 muids per acre. Showing that there is not much difference between the two when the bone dust is good.

But, of course, there is a very great saving in cost in using Thomas Phosphate,the present price being about £4 10s. per ton, and bone dust about £7—when procurable at all.

Mr. Andersson, a Swede, has now solved the problems of dairy lectures by rigging out a model dairy, which can be easily carried on a lady's bicycle. The dairy instructress packs up her dairy outfit as follows :—An ordinary ladies' safety bicycle, a small Holstein churn, a separator, cream tin butter worker, milk receiver, Scotch hands and thermometer, and small hair sieve The whole of this weighs, apart from the bicycle, 42 lbs., and costs 45s. Thus the dairy instructress can cycle from farm to farm, teaching the latest and most correct principles of butter-making.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
B. Wilkes ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	F. R. Moor ...	Greystone.
		,,	F. Bloy	Monte Cristo.
		,,	J. G. Maritz ...	Vi Plaats.
		,,	F. Knapp ...	Klipfontein.
		,,	G. M. Rudolph ...	Spitzburg.
		,,	J. W. Moor ...	Moorleigh.
		,,	J. Oates ...	Oatsvale.
		,,	R. C. O'Neil ...	Hillgrove.
		,,	C. J. Labuscagne...	Haatsfontein.
		,,	B. J. Wilkes ...	Portington.
		,,	J. G. Hatting ...	Rama.
		,	A. G. Harding ...	Marshlands.
		,,	Du Plessis & Cloete	Compensation.
		,,	J. Van der Merwe	Welgekoose
		,,	A. Pretorius ..	Shypoort
J. Button ..	Estcourt, South of Bushman's River	,,	S. Nel ...	Wagon Drift.
		,,	C. Cope	The Hoek.
		,,	C. B. Lloyd ...	Hidcote.
		,,	Mrs Lindsay ..	Rosebank.
		,,	Geo. Gibson ...	Craignevin.
		,,	S. C. Boshoff ...	Waterhoek.
		,,	L. Schomann ...	Twyfelfontein.
		,,	S. Schomann ...	Willow Grange.
		,,	C. Groom ...	Springvale.
		,,	W. McFie ...	Highlands.
		,,	J. K. H. Miller ...	Beacon Hill.
		,,	J. Piccione ...	Greenfields.
		,,	F. Stanley	Nonpariel.
		,,	H. E. Kirby ...	Klipfontein.
		,,	A. G. Stead	Allendale
		,,	J. Marais ...	Malan Spruit
		,,	A. Lawrence ...	Grantleigh.
A. H. Ball ..	Weenen ...	,,	W. Lotter ...	Doornkloof.
		,,	P Van Rooyen ...	Middleburg.
		,,	C. P. F. Van Rooyen	Mona.
		,,	P. M. Lotter ...	Waterfall.
		,,	S. C. Van Rooyen	Middleberg.
		Lungsickness	Mgina... ...	Location
		,,	Maboko	Bushman's River Poort.
J. J. Hodson ...	Lion's River ...	Scab	W. Taylor ...	Fordoun.
		,,	W. T. Shaw ...	Shawswood.
		,,	W. Pepworth ...	Bolesworth.
		,,	Mrs F. McKenzie	Onverwacht.
		,,	W. L. Methley ...	Newstead.
		,,	J. J. Morton ...	Sherwood.
		,,	F. Curry ...	Weltevreden.
		,,	Geo. Woodhouse	Halliwell.
		,,	Jas. Ross ...	Gowrie.
		,,	A. Meugens ...	The Mains.
E. J. B. Hosking ...	Upper Umkomanzi	,,	Mr. Gibson ...	Howard's Hill.
		,,	Wm. Watson ...	Minerva.

Stock Inspector.	District.	Disease.	Owner.	Farm.
R. J. Raw ...	Impendhle ...	Scab	T. Fleming ...	Good Hope.
		,,	J. W. Brooke ...	Impendhle Store.
		,,	G. Renyard ...	Hamilton Hall.
		,,	A. C. Crosse ...	Dingley Dell.
		,,	R. Gresham ...	Castle Howard.
		,,	C. P. Speirs ...	Mount Park.
		Lungsickness	C. C. Lewis, and Native ...	Clairmont.
W. Wilson	Polela	Scab	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
		,,	R. C. Gold ...	Woodend.
		,,	R. M. Arbuckle ...	Costmore.
		,,	J. J. Van Dyke ...	Riverport.
		,,	J. Van der Merwe	Nooitgedacht.
		,,	S. Maritz ...	Maritzdale.
		,,	F. E. Peto ...	Clovelly.
		,,	H. Nicholson ...	Fondling.
		,,	H. C. Gold ...	Dartford & Greenend.
C. E. Hancock ...	Ixopo ...	,,	R. Kennedy ...	Cornhill.
		,,	A. Watson ...	Rosehill.
		,,	W. Gray ...	Helmsley.
		,,	Natives ...	Langefontein.
		,,	J. Dalgarno ...	Abercairney.
		,,	A. Stone	Craigie Lee.
		,,	W. W. Walton ...	Dronk Vlei.
		,,	P. J. Webb ...	Crystal Manor.
		,,	L. Howes ...	Mornington.
		,,	G. Thompson ...	Cromwell.
		,,	J. Anderson ...	Littledale.
		,,	Est. R. Raw ...	Eastwolds.
		,,	Lulakana ...	Mackenzie's Farm.
		,,	A. E. Keith ...	Norwood.
		,,	J. W. Marwick ...	Flettsberg.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	W. Oldfield ...	Ambleton.
		,,	Pietermaritzburg Corporation ...	Sanitary Depôt.
		,,	F. Knapp & Nonshlene ...	Polly Shorts.
		,,	J. Townsend ...	146, West Street, Pietermaritzburg.
		,,	T. Owen ...	9, Pietermaritz St.
		,,	P. H. McCrystal...	11, ,,
		,,	F. Knapp	,,
		Scab	Ulukozana ...	Bishopstowe.
J. A. Morrison ...	Durban & Umlazi	Lungsickness	H. F. Pearson ...	Everton.
		,,	Muti ...	Infuni M.S.
W. A. Hutchinson	Alfred ...	Scab	Nqubu ...	Location.
		,,	Makubana ...	Amaci Location.
		,,	J. Wessels ...	Sheepwalk.
		,,	Geletu Flentyi ...	Location
		,,	Inkubi and Duli ...	Location
		,,	C. J. Triegaart ...	The May.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	F. E. Zunckel ...	Rivulet.
		,,	J. Lawford ...	Emmadale.
		,,	Natives	Hongerspoort.
		Scab	A. J. Harding ...	Zwart Kop.
		,,	J. Dryer ...	Culfergie.
		,,	J. M. Wales ...	Farleigh.
		,,	D. Evans	Zuur Laager
G. N. Perfect ...	Umvoti—Eastern Portion	,,	J. M. Botha	Baviaankrans.
E. Varty ...	Umvoti, Western Portion	,,	J. M Van Rooyen	Pompoennek.
A. S. Parkinson ...	New Hanover ...	,,	Ingongoni ...	King's Cliff.
		,,	R Smith ...	Effingham.

Stock Inspector.	District.	Disease.	Owner.	Farm.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	— Thompson ...	Marburg.
		„	W. Clothier ...	Ultima Thule.
		„	C. Mahai	Marburg.
		„	C. Kaupar ...	„
		„	J. Malichi ...	„
		„	H. Mason	Oakhurst.

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

Rinderpest at present exists amongst natives' cattle on farms Doornhoek and Kirkintulloch, in the Ladysmith Division, and on farms Schoonspruit and Zandspruit, in the Upper Tugela Division north of the Tugela River.

Principal Veterinary Surgeon's Office, 20th November, 1901. M. J. HIME, for P. V. Surgeon.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of October, 1901 :—

Name of Colliery.	Labour Employed. Above Ground. E.	N.	I.	Below Ground E.	N.	I.	Coal raised. tons.	cwt.
*Natal Navigation	15	30	158	11	150	220	10,751	2
Dundee Coal Coy.	15	20	105	14	151	278	9,655	13
Elands Laagte	11	25	160	11	135	285	9,063	0
Natal Marine	11	107	20	7	295	4	8,006	11
St. George's	11	82	16	6	149	2	4,114	0
†No. 42	8	6	14	4	151	0	2,055	6
Crown	12	42	3	4	130	2	1,932	0
Newcastle	4	18	11	4	120	0	1,800	11
Natal Steam Coal	4	38	7	2	72	2	1,260	0
Dudley	5	17	3	2	32	1	802	0
Inkunzi	2	10	0	1	38	0	536	8
West Lennoxton	2	2	8	1	14	27	520	0
Central	11	37	3	3	53	0	203	4
Hillside Colliery	0	3	0	1	4	0	50	7
Total	111	437	508	71	1,494	821	50,750	2
Corresponding month, 1900 ...	84	482	321	53	1,597	546	38,302	17

*Also four Europeans and six Indians employed on unproductive work.
†24 tons 16 cwt. omitted from September Return.

Mines Office,
November 7th, 1901.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of October, 1901 :—

	tons.	cwt.
*Coal Bunkered	22,145	17
Coal exported to Cape Colony	5,420	6
„ Beira	274	0
Chinde	43	4
Total	27,883	7

*No Imported Coal is Included in this item.

GEO. MAYSTON,
Collector of Customs.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of October, 1901

STATIONS	TEMPERATURE (In Fahr. Degrees).				RAINFALL (in inches).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1901.	Total for same per'd from July 1st, 1900.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	75·4	59 8	88·0	53·5	3·20	21	·43	19th	13·46	9·07
Stanger...	76·3	57·5	92·0	50·0	3·12	24	·38	7th	10·07	8·01
Verulam	78·6	59 6	89·0	52·0	2·85	16	·47	11th	10·87	9 12
Greytown	82·9	54·5	93·0	40·0	4·57	13	·83	10th	10 69	4·73
Newcastle	86·9	55·1	93·0	47·0	4·25	9	1·56	11th	9 01	2·37
Estcourt	76·9	49·6	92·0	42·0	1·95	13	·55	30th	5·07	4 73
Port Shepstone ...	71·8	57·3	85·0	50·0	3·53	17	·97	25th	16·39	9·13
Umzinto	78·8	53·3	80·0	51·0	1 33	17	·21	30th	8 90	8·97
Richmond	70·9	52·0	96·0	41·0	4 38	19	1·13	7th	9·23	6·04
Maritzburg	75·9	53·2	99·0	51·0	2 33	15	·60	7th	7·10	4·34
Howick...	74·3	49·6	92·0	47·0	3 23	17	1·19	11th	8·30	3·42
Dundee	78·0	45·8	90 0	38·0	4·40	9	1·64	29th	10 40	...
Weenen	82·9	51·1	98·0	42 0	1·87	7	·60	10th	5·27	4·33
New Hanover	75·4	54·1	96·0	40 0	3·28	18	·87	10th	10·61	5·2
Hillcrest	68·2	54·4	85·0	45·0	2·71	17	·44	30th	10·54	...
Mapumulo	78·1	54·8	95·0	47 0	4.48	13	·84	8th	12·30	6·73
Nongoma	72·7	54·4	91·0	45·0	3·14	10	·61	30th	8·50	3·87
Qudeni	66·8	45·9	84·0	32 0	6 21	18	1·21	8th	16·97	...
Umlalazi	73·1	54·9	90·0	45·0	5 52	14	1·66	24th	...	8·18
Hlabisa	73·8	56·2	96·0	49 0	3 90	11	·70	30th & 31st	12·10	...
Melmoth	77·2	54·3	101 0	45·0	2 80	14	·47	24th	8 91	5·14
Ubombo	73·4	56·3	89·0	48·0	1·61	11	·48	12th	8·69	4·08
Nqutu	70·6	50·8	93·0	39 0	2 52	10	·87	30th	...	...
Point	...	..	...	...	3 27	12	·65	12th	10 26	6·55
South Coast Junction	...	...	. .	...	3·39	26	·65	24th	14 79	...

OTHER STATIONS.

Estcourt	...	...	91	40	2·33	10	·64	29th	6·09	4·42
Nottingham Road ..	...	...	..	...	4·86	16	1·20	11th	11·04	...
Adamshurst	...	...	90	41	2·73	13	1·16	11th	7·18	...
Hilton	...	...	92	38	3·69	16	1·02	11th	9·51	5·30
Ixopo (Gorton) ...	...	...	86	52	1·11	5	·65	11th	3·69	3·54
Mid Illovo (Ismont)...	...	...	85	44	4·06	16	·94	9th	12.25	5·96
Ottawa	...	...	...	...	2·55	13	·48	3rd	10·91	9·17
Mount Edgecombe ...	...	...	86	55	2·51	14	·44	25th	12 52	9·64
Cornubia	...	.	...	...	3·46	...	...	...	13 22	11·61
Milkwood Kraal ...	...	...	...	...	1·78	...	.	..	9·07	6·30
Blackburn	...	...	...	...	3 08	...	...	...	11·04	9·68
Saccharine	...	...	...	...	2·14	...	...	...	11·90	9·76
Prospect Hall... ...	...	...	...	...	2·92	...	...	...	11·73	...
Clairmont	...	...	...	...	3·73	12	·80	24th	14·10	...
Equeefa	...	...	84	54	2·36	17	·69	24th	11·84	7·86
Umzinto (Beneva) ...	...	...		..	2·25	12	·60	25th	11·69	7·98

Notes on Australian Timber Trees.

THE following notes, written by Mr. Walter Gill, F.L.S., F.R.H.S., Conservator of Forests, South Australia, have been forwarded to the Hon. F. R. Moor, M.L.A., and are published by direction :—

Eucalyptus leucoxylon (Mueller), vernacular name "Blue Gum." References : Bentham's Fl. Austr., Vol III., f. 209. Mueller's Select Extra Tropical Plants, 138. Mueller's Eucalyptographia, 1st Decade. Widely distributed throughout South Australia, attaining a height of from 80 to 100 feet, and a diameter of 3 to 5 feet. The timber is exceedingly strong and durable, generally weighing from 60 to 70 lbs. per cubic foot when seasoned. It makes excellent naves, felloes, spokes, sleepers, posts, mining timber, well slabs, piles, and telegraph poles ; very useful also for purposes requiring great lateral strength. The colour of the timber varies from pale yellow to brown, and even pale red or pink in some localities, and is thus often well adapted for furniture, especially for parquet flooring in combination with other gum timbers. The bark, which is fibrous in character, affords a good material for paper.

Eucalyptus rostrata (Schlecht), vernacular name "Red Gum." References : Benth Fl. Austr., Vol. III., f. 240. Mueller's Select Extra Tropical Plants, 145. Mueller's Eucalyptographia 4th Decade. A fine large tree of spreading habit found extensively throughout South Australia, attaining frequently a height of 100 feet, but generally developing a large bole of from 6 to 8, or, in special cases, of 10 feet in diameter at the base. The quality of the timber varies with the kind of "habitat." That grown on hilly ground cannot be excelled, though somewhat lighter than that grown in rich moist land, and according to situation. The weight per cubic foot varies from 50 to 70 lbs. in seasoned timber. The colour is generally dark red, hence its name ; and though sometimes hard it is more easily worked than any other gum. It is admirably adapted for a great variety of uses, either above or under ground or in water. As fencing posts it will last 30 years, and even more, standing unrivalled for this purpose ; nor can it be excelled for piles or railway sleepers when of the best quality, as it resists well both the white ant and the teredo. For ship-building, house and wagon work it is well suited, and also for many minor uses, amongst which it may be noted that it is much preferred for bullock yokes, as it wears smooth without splintering. As a timber for furniture, especially veneers, selected pieces are admirably fitted, the mottled and wavy figure often met with being singularly beautiful ; when very dark in colour it frequently resembles the best mahogany. It also makes good blocks for street paving, and an excellent material for parquet flooring. Single trees when felled and converted into sleepers have occasionally produced as many as 100, 220, and even 250 sleepers of the dimensions 6 ft. 6 in. x 8 in. x 4½ in.

Eucalyptus corynocalyx Mueller) vernacular name "Sugar Gum." References : Benth Fl. Austr. Vol. III., f. 218. Mueller's Select Extra Tropical Plants, 134. Mueller's Eucalyptographia 2nd Decade. This tree is found in South Australia, principally near Port Lincoln, in Flinder's Ranges, and on Kangaroo Island. The wood is hard, dense, and durable, losing but little in seasoning ; it weighs, when dry, generally 65 to 70 lbs. per cubic foot. It is yellowish brown in colour, often showing a handsome wavy grain. It is used for posts, rails, piles, wheelwright's work, and railway sleepers, also for furniture ; selected specimens cut to veneers have proved very effective; while, for parquet flooring, in common with several other Australian timbers, it possesses many serviceable qualifications.

Eucalyptus hemiphloia (F. Mueller), vernacular name "Box Gum." References : Benth Fl. Austr., Vol III., f. 216. Mueller's Extra Tropical Plants, 121. Mueller's Eucalyptographia, 5th Decade. A fair-sized tree, often of spreading

habits, from 50 to 90 feet high, and 3 or 4 feet in diameter at base, when growing on hilly country in South Australia. Found also in Victoria and New South Wales, where it reaches larger dimensions in more humid districts. In South Australia it occurs principally on the Flinder's Range, and is easily distinguishable from other gums by its persistent bark on trunk and lower limbs, though it sheds the bark on the higher limbs, whence originates its name of "half-barked." A most valuable timber, dense, hard, and of great strength, with close interlocked grain; it is admirably suited for many and varied uses, such as naves, felloes, shafts, spokes, railway sleepers, fence posts and rails, and mauls. It is pale yellow in colour generally, though sometimes of a browner tinge, and when seasoned weighs from 60 to 70 lbs. per cubic foot.

Eucalyptus obliqua (L'Herit), vernacular name "Stringy-bark Gum." References: Benth Fl. Austr., Vol. III., f. 204. Mueller's Extra Tropical Plants. 141. Mueller's Eucalyptographia, 3rd Decade. A tall tree with persistent bark, attaining a height of 100 feet and over, with a diameter of 3 or 4 feet; found in the Mount Lofty Ranges and the south-eastern part of South Australia, generally on poor ironstone and sandy rises. A useful timber of 50 or 60 lbs. weight per cubic foot when dry; of good tensile strength, very fissile, light in colour, and adapted for fencing posts and rails, shingles, palings, rafters, and scaffold poles. Though not the best of timber for fencing, it possesses one advantage peculiar to itself, in that it does not readily burn when exposed to bush fires, often escaping with a slight charring where other posts burn to the ground. The bark is used roofing huts, and is likewise well suited for paper making.

[The Conservator of Forests has been asked to have the kindness to procure and forward seed of the above-mentioned trees. On arrival of the seed notice as to distribution will be published in the *Journal*.]

Dairying.

MILK AS A FEEDING STUFF.

SINCE milk is a substance (says the "Rural World") designed wholly by nature for the sustenance of young animals, we may suppose it to be properly constituted in all particulars for that purpose. Each 100 pounds of cow's milk contains about seven-tenths of a pound of mineral matter, which is essential to the upbuilding of the bony framework of the body. Then it contains about 3.5 pounds of protein, consisting mostly of casein, with some albumen. This group of substances is designed by nature for the construction of the muscular portion of the animal's body, as well as the bones, nerves, skin, tendons, hair, horns, etc. Another of the solid constituents is milk sugar, of which there are between four and five pounds in each 100 pounds of milk. The sugar found in milk is not particularly sweet, but it is as nutritious as other sugar. Lastly, there is fat, which ranges from 3 to 5 or 6 per cent., according to the breed of the animal, etc. Both the fat and the milk sugar are designed for supplying heat to the body as well as the energy exhibited, and finally any excess may be stored as fat in the tissues against a time of need.

In the manufacture of butter only the fat is removed from the milk, and the by-product, skim milk, has a low selling value when it can be sold at all. Stockmen will ordinarily use skim milk rather than full milk. Skim milk can be fed to all classes of young farm animals with success, and usually with profit. It is not well to feed a large quantity of milk of any kind to a growing animal, for it may make it coarse, clumsy, and too fat if given in excess. Experience has shown plainly that skim milk fresh from the farm separator is an admirable food for calves, even when designed for beef purposes, provided that there is a proper addition of maize meal, oats, or oil meal.

The Iowa Experiment Station did a fine piece of work when it showed that maize meal is an excellent addition to skim milk for feeding calves designed for beef purposes. The reason advanced by Prof. Curtiss was also correct when he showed that skim milk was excessively rich in the muscle-building elements, and that the addition of oil meal only increased the excess, while maize meal would furnish the carbohydrates, and thereby secure a better balance of nutrients. Many years ago the writer, in a carefully-conducted experiment, showed that *skim milk* was an economical feed for young lambs, and that they would thrive on it as well as young pigs. For pig-feeding the usefulness of skim milk is universally recognised, and little need be said on this branch of the subject. Feeders are reminded, however, that the best results are secured where the milk is not fed in excess. In a series of nineteen trials to determine the value of skim milk the writer found out that it was not well to give over three pounds of skim milk with each pound of grain, and a still lower ratio may be used with advantage unless the milk is very abundant.

Milk, either whole or skimmed, may be used by those who wish to have young animals attain a high finish for exhibition or sale purposes. As before indicated, it is easy to overdo matters in this particular. Lambs are often fed milk to bring them to heavy weights and early maturity for exhibition purposes. Pigs receiving milk show it in their glossy hair and rotund bodies. The excellent balance which milk makes possible when added to maize for pig-feeding is shown by experiments conducted by the writer some years since. One lot of growing pigs was maintained on maize, with no other addition except wood ashes, salt and water. A second lot from the same litter received milk additional. After continuing the feeding many weeks, the pigs were slaughtered, and it was found that those receiving skim milk had not only grown much more rapidly and were consequently larger than the others, but that there was more lean meat or muscle in the carcases. Maize had made fat, but not properly nourished the muscular portion of the body. Breaking the thigh bones of these pigs in the testing machine showed that the bones of the pigs getting skim milk were from one to three times as strong as those maintained exclusively on maize. The maize-fed pigs were fat and flabby, with weak bones and pinched muscles; they were dwarfed in size. Those getting milk with maize were growing to full size and had abundance of muscle or red meat and the best of bones.

Lucerne Ensilage.

A LATE Colorado bulletin, says the "Queensland Agricultural Journal," gives some tests made of alfalfa or lucerne as an ensilage plant. One test, says the bulletin, was made with the alfalfa put in whole as cut in the field; the other with alfalfa cut to quarter-inch pieces, as we cut our corn for ensilage. The whole alfalfa showed a spoiled layer three inches thick on the top and one inch layer round the side nearly all the way down. The ensilage of the bottom and middle was excellent, and was greedily eaten by the cows and calves. Its loss in the total weight was 10·7 per cent.; but its loss in feeding value was probably a little larger.

The other silo was filled with cut alfalfa. The next day the silo was covered with two thicknesses of building paper and one of boards, and weighted with stone to about 55 lb. per square foot. When covered the ensilage was hotter than the hand could bear. Two days later the temperature had fallen to 83 degrees Fah., and in two days more it had fallen to that of the air. The ensilage shrank and settled a good deal. When put in, it contained 3 per cent. of dry matter. On opening, the silo showed two inches of spoiled ensilage on top and half inch on the sides. The spoiled ensilage was 7·3 per cent of the total weight. The loss in dry matter was approximately 10 per cent.

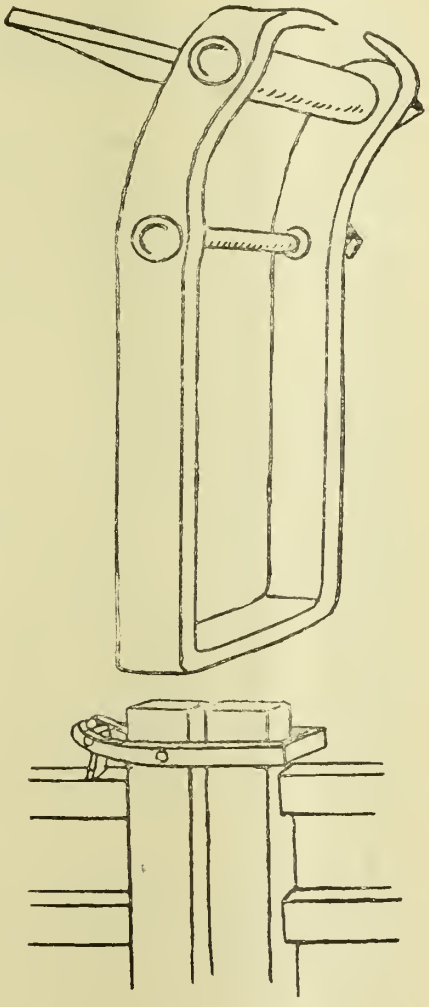
It is fair to presume that with a good tight silo well-made ensilage from cut

alfalfa should not make a larger loss than was here given in our experimental silo, or about 10 per cent. of its feeding value. To make good ensilage from whole alfalfa is a much harder proposition. It requires that the alfalfa be quite green ; that the silo be both tight and deep ; that the alfalfa be thrown into the silo in small forkfuls and carefully tramped, and that it be weighted, by from 4 to 6 feet of some heavy, tight-packing material, like cut corn fodder. If the alfalfa is put up in the middle of summer, in clear bright weather, it must be raked and loaded just as fast as cut. One lot we tried was too dry for ensilage two hours after it was cut.

Comparing the three methods of handling alfalfa—in the stack, in the barn, and in the form of ensilage - the bulletin says that, under the best of ordinary conditions, for every 100 lb. of feeding value as it exists in the green alfalfa at the time it is cut by the mower, 75 lb. will be saved if the hay is well cured and put in a stack under good conditions ; 86 lb. will be saved if put in the barn ; and 90 lb. can be expected if made into first-class ensilage. In the comparison of the ensilage and the stacked hay, the principal advantage of the ensilage must lie in the fact that the alfalfa can be put in the silo, even under bad conditions of weather at time of cutting, and that once siloed it is safe from the worst weather.

A Safe Gate-Fastener.

ONE of the most simple and safe gate-fasteners we have seen is that shown in our sketch. It is made of iron 1in. broad and ¼in. thick. The part that goes over the gate-head being much longer than that on the other side of the bolt will keep it down. When a horse attempts to lift the loop the pendant piece of iron plate, ⅛in. thick, on the other side, coming down on the top rail effectually prevents the loop from being raised over the gate-head. The centre bolt should have plenty of play, also the pendant piece of plate. The latter should hang loosely, so as to be always in place. When one wishes to open the gate the piece of plate is raised outward, when the loop can easily be raised over the gate-head. This gate-fastener is in common use about Mansfield, and no horse or cow has yet succeeded in opening a gate fastened with it. Fig. 1 shows the gate fastened ; fig. 2 the fastener detached.—*Australasian.*



A clever scheme for adulterating milk by which all the cream is removed, but will still pass the Babcock test, has been discovered in New York, and it is believed to have been practised to a small extent in several parts of the State. The milkman stirs into the skim milk an emulsion of fats, manufactured for medicinal purposes, much in the same way that skim milk is fixed for making filled cheese. These parts are made up of the same ingredients which enter into oleomargarine. It is said to give the milk a fine, rich appearance, and a chemical analysis is required to show that it is not butter fat.

Culture and Manuring of Mealies.

By Alexander Pardy, F.C.S.

A STUDY of the root system of the mealie is of the utmost practical importance in indicating a proper system of land preparation, manuring, and cultivation of that crop.

I am indebted to the U.S.A. North Dakota Agricultural College authorities for a copy of their publication, giving much valuable information from a study of the mealie root which has been closely investigated by them. The method of observation they adopted was the cage system; the plants with the soil in which they grew were enveloped in a wire-netting box, through which wires were interlaced from side to side to keep the roots in their natural position, so that when the soil was washed away by a force of water the roots were exposed to view in the exact position which they occupied when in the soil. The following condensed description may serve to give some insight into the development of the roots as observed by these investigators.

The hills were 3 feet apart, and each contained 5 stalks of corn. The average height of the plants to the tip of the leaves was 26 inches at 30 days after planting when first examined; the stalks extended beneath the surface of the ground $1\frac{1}{4}$ to $1\frac{1}{2}$ inches. From the base of the stalks the roots radiated in the form of whorls; up to this date the main development of the roots appeared to be lateral, or to the side rather than directly beneath the plant; the roots from each hill had met and interlaced, some being as much as 2 feet long. These side roots lay from $2\frac{1}{2}$ to $4\frac{1}{2}$ inches below the surface, a few having penetrated to a depth of 12 inches, but the bulk of them lay within 8 inches of the surface.

The field was hoed four times, but received no other cultivation, and at 55 days old the corn stood 54 inches high and 70 inches to the tip of the leaves; the roots were much more numerous, several whorls being thrown out above the others, those in the last whorls being 4 to 6 inches long and resembling brace roots. Nearly all the latter whorls had struck directly downwards into the soil, reaching a greater depth than the earlier roots, and were coarser and stronger than those which ran laterally. Many of the primary roots had penetrated to a depth of $2\frac{1}{2}$ feet, the horizontal roots had increased both in number and length, extending now from hill to hill, inclining slightly most of their length, but finally, at about 3 to $3\frac{1}{2}$ feet from the hill, they dipped almost vertically downward, probably on account of the dry weather in the latter part of their growth. The horizontal roots had sent out small feeders extending in all directions upward, laterally, and downward. Many vertical branches of the roots reached depths almost equal to the primary vertical roots directly beneath the hill; these branches gave off other branches, so that the whole soil at this stage was practically filled with roots to the depth of 2 feet.

At 90 days, when the ears had developed almost to the milky stage, it was observed that the ground to within an inch of the surface was full of small fibrous roots; the soil of the whole field to the depth of $3\frac{1}{2}$ feet was fully occupied by the roots of the mealies.

From this interesting account of the root development it will be seen that the mealie is largely a surface feeder, throwing out its roots horizontally within an inch of the surface; it is also a heavy feeder, as indicated by the large mass of roots sent out in search of food and moisture, and the plan of their distribution should serve as a guide to the cultivation and care of the crop if the significance of these developments are properly interpreted.

It has been estimated that the evaporation of moisture through the crop in comparison is far greater than the average of other crops; yet, although its moisture requirements are great, it is very susceptible to standing or stagnant water. So long as the drainage is good and the water does not lie at its roots it will flourish during abundant rain; for this reason a deep free soil, containing a good

share of humus matter to conserve the moisture, is probably the ideal one for mealie growing. Such a soil will not only absorb water, but will act as a reservoir from which the plant may freely draw on that supply required by it.

Any fairly good soil will grow mealies, but the nearer it can be brought into this ideal state the more success in its growth may be attained. Shallow soils resting on a stiff bottom may produce good average crops so long as they are fairly moist, but during a season of drought they are apt to dry out and result in a falling off of the crop.

The land should be prepared by first deeply ploughing ; it is injudicious to disturb the natural lie of the soil suddenly by bringing the subsoil to the top or mixing with that of the surface ; if the land has not previously had a deep ploughing the wiser plan will be to gradually deepen the cut at each successive yearly turning over until a depth of from 7 to 9 inches has been attained.

It was observed in the above investigation that the bulk of the roots were contained in the first 8 inches of the soil, and it was also found in ordinary cultivated ground that in the earlier stages of the plant growth that the roots had a difficulty in penetrating the hard layer formed by the running of the plough and weight of the animals at the usual depth to which plough cultivation had successively been carried out.

Heavy and clay soils should be turned over deeply in the autumn or winter, so that the action of frost if any) or the extremes of heat and cold may assist in their disintegration, whereas light and sandy soils are probably better to be turned over in the spring before planting, as their texture is already loose and rather requires compacting.

Where the soil is thin and rests on a stiff subsoil, much benefit may be derived from the use of the subsoiler following the plough ; by it the bottom soil will be loosened and stirred without being brought to the surface, so producing more scope for root penetration, improving the water capacity, and using the drainage.

It is a mistake to plough heavy clay soils when they are wet, as they set hard and bake when drying, and become most difficult to reduce again to a fine tilth.

Cross-plough in the spring to the depth of 3 or 4 inches, then harrow each way sufficiently often to break up the surface well and produce a fine tilth. Cultivation will certainly pay with this crop, and it should be determined that a judicious amount of working will be given to prove the success of these operations. Such cultivation will result in a well aerated soil, level and free from weeds, ready to absorb moisture and promote the best root growth of the plants.

There are several methods of planting, but by consensus of opinion the drill is the most efficient one. By it the seeds are dropped regularly and covered at uniform depths, provided the land has been well levelled, giving a regular stand of corn. Whichever way the seed are planted, whether in the furrow or by means of the drill, they should be so arranged that after cultivation between the rows will be an easy undertaking.

Once the corn is planted the harrows should be run over the surface, and again when the plants just appear above ground. If blunt, light harrows are used for this purpose there is little danger of injuring the young plants to any extent. Many keep the disc or harrows going till the crop is four inches high. These operations have the effect of keeping the soil in good condition, mulcifying it, and disturbing or killing any young weeds which have begun to sprout ; by cultivating at this time with the harrows or hoe they can be so effectually checked that danger from their getting the upper hand is practically averted.

All the cultivation now should be shallow, not extending more than three inches at the most below the surface, as there the roots lie, and any harsh pruning will result in injury. Keep the cultivator or horse-hoe going between the rows until the plants are 3 or 4 feet high, and by that time they should have made such a good stand that every success can be safely anticipated.

The thickness of sowing will depend much on the nature of the soil and local experience ; that found best on average soils is in rows 3 to 4 feet apart, with spaces of 10 to 16 inches between the seed in the row. In light land the rows may be of the narrower dimension, with the seed far apart in the row, and in rich land

wider rows with thicker planting; the width of the row will counter-balance the more plentiful setting by allowing room for cultivation and admitting air and light, besides giving a good thick stand. The number of seed to each hole is a debatable question. Many favour a single good seed to a set, but on the other hand it is doubtful if a single plant will make as good a return. A thicker sowing of two seeds to the set will ensure a greater number of plants and allow for bad seed, ravages of insects, and other losses which are difficult to remedy when the sowing is found to be too thin. The quantity sown will be so far regulated by what the land is profitably capable of bringing to maturity; too heavy planting is likely to result in number of plants at the expense of yield in stem and cob.

There is much yet to be done in Natal in an experimental way regarding the most profitable weight of seed to sow and the best depth of planting; these are, of course, largely regulated by the condition of the seed, soil, climate, and season, and until experiments are instituted each farmer will have, to a certain extent, to derive his opinions from the experience he has gained on his own land.

It is certainly a mistake to keep on planting mealies year after year on the same land without a change of crop; rotation, whether in the shape of smaller grains such as oats, barley or rye, roots, clovers, peas or beans, should have its place on the farm. Thereby the land is rested from the constant draught on some particular part of its resources; change relieves and rests the land and prevents it becoming what is termed "sick" of a particular crop. It is refreshed and renewed by the change to a crop having a different root system.

An average crop of mealies, including stems, leaves and cobs, will remove per acre some 74 lbs. of nitrogen, 27 lbs. of phosphoric acid, and 64 lbs. of potash. So it will be seen that the plant draws largely on all the fertile constituents; if these are not already in the soil in sufficient quantities, which is seldom the case, they must be added in some suitable form. Good farmyard manure makes a splendid basis for manuring, especially when supplemented by artificials either supplying one deficient ingredient or complete, as the case may be. Nitrogen is largely drawn on, and it is one of the most costly elements we have to supply in the form of a bought manure, yet by adopting a system of rotation with a leguminous crop or growing such for the purpose of green manuring, the nitrogen content of the land may be largely increased, at a much less expense than through the purchase of artificials.

It is impossible to set down a fixed formulæ for a manure which will just suit the mealie under all circumstances, owing to the variation in soils and other conditions which govern its growth. Each individual soil would have to be examined in order to ascertain its peculiarites before a fertiliser could be prescribed which would meet the wants of the lands and crop. But taking into account the duration of growth of the plant, some knowledge of Natal soils and approval which certain mixtures have had under experiment in other countries, and recent observations which have demonstrated that physiological conditions largely govern the fertility of a soil, and the power crops have of making use of the materials within their reach, a formulæ may be arranged to suit the crop in the majority of soils.

The following manure is devised to apply to the mealie crop :—

Bone Dust	140 lbs.	per acre.
Superphosphate	112 „	
Sulphate of Ammonia	98 „	
Sulphate of Potash	70 „	
	420 lbs.	

This works out at 6 per cent. nitrogen, 11.5 per cent. phosphoric acid, and 8.5 per cent. potash, or 25 lbs. nitrogen, 48 lbs. phosphoric acid, and 36.5 lbs. potash to the acre.

I have purposely named those fertilisers which can be procured in Natal, and these may be all mixed together and sown simultaneously if for immediate use, but if the mixture will have to stand for some time it is preferable to sow the bone dust by itself and mix the others together, or keep the two lots separate till time of sowing. The mixture at present prices will probably cost about £2 2s. 6d., it gives the phosphate partly in a soluble and partly insoluble state.

Basic slag may be substituted for bone dust, say at the rate of 1½ cwt. It is a

cheap form of a phosphatic manure, and although direct experiments have not yet demonstrated its efficiency over other forms in Natal, yet it has a good record elsewhere, and is probably most suitable for our soils. The slag should not be mixed with the other manures, but rather spread by itself sometime previous to planting.

Kainit may be substituted for sulphate of potash, but about four times the weight will have to be used, as its percentage of potash is much less than that of the sulphate.

Paspalum Dilatatum Criticised.

"OXONIAN," Bundaberg, sends the following account of his experience of this fodder grass to the "Queensland Agricultural Journal":—We are constantly reading in the agricultural papers notices of the grass *paspalum dilatatum*, many of which, I think, are very misleading. A few notes, therefore, on our own experiences with the same may prove acceptable to some of your readers. We commenced in a small way with a parcel of seed some five years ago, and have had it constantly under observation during the whole time. We now have several acres of it, and find that it grows readily from seed sown in hot and moist times, seldom germinating in cool weather. It is very easily transplanted from the seed bed, grows quickly in the summer time, does not make much growth in cold weather, turns a brown colour with 6 degrees of frost, and, during the hot day and trying time of the present year, was just as much done up as many of the indigenous grasses. It is *not* easily destroyed by ploughing, etc. It is impossible to kill it with an ordinary horse cultivator in the summer time if there is any moisture in the soil. In showery weather it seems to grow better for being knocked about by the horse hoe. Owing to the lightness of the seed it is constantly turning up in unexpected places in the cultivation paddocks, and a fair stool of it will throw out of ground an ordinary 2-horse plough. Stock are fond of it. We consider it a good grass, but would advise any of your readers thinking of giving it a trial to keep it clear of their cultivated land, or sow in some out-of-the-way and lowest corner where it cannot so readily spread. I believe it will yet prove a great nuisance to farmers. I am aware that this is very different to what we generally read, but those facts are given from our experience with it.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—Trade generally is quiet, and there is very little change in prices of produce; in fact, one might almost say they remain the same as in our last report.

Mealies.—Prices on the market vary between 5s. 8d. and 6s. 5d. per 100lbs.; privately grain has been disposed of at about 12s. per muid.

Forage.—The market is now better supplied than it has been for months past, and some samples have been as low as 3s. 9d., 5s. 3d., and 7s. 7d. per 100lbs. However, good forage has realised from 9s. 3d. to 10s. 7d. per 100lbs.

Hay.—The damp weather has prevented large quantities coming forward, and prices have

fluctuated between 1s. 3d. and 3s. 4d. per 100lbs. ; bedding from 4s. 6d. to 20s. 3d. per load.

Potatoes.—The market has been fairly supplied during the past fortnight, and while some samples have varied between 3s. 9d. and 8s. per 100lbs., others have been sold at 18s. 6d. to 21s. 6d. per 100lbs. ; sweet potatoes from 1s. to 6s. per sack.

Mabele.—From 6s. to 7s. 6d. per 100lbs.

Pumpkins.—9s per doz.

Beans.—Red beans have been sold at an average of about 12s. 9d. per 100lbs.

Peas.—A quantity of seed peas have been offered, and prices have realised from 7s. 3d. to to 33s. per 100lbs.

Tobacco.—Very little offering ; one sample realised 6d. per lb.

Onions.—Prices have now considerably fallen, and some samples have been disposed of at 8s. to 10s. 3d. per 100lbs. ; better samples at 13s. 3d. to 14s. 6d. per 100lbs.

Butter.—Several mornings butter only realised 8d. per lb. ; but good quality butter was sold at from 1s. 4d. to 1s. 9d. per lb.

Eggs.—For the time of the year prices are low, on several occasions 1s. 1d., 1s. 3d., and 1s. 6d. being top prices ; the highest figures being from 2s. to 2s. 6d. per doz

Poultry.—Common fowls from 2s. to 5s. each. ; ducks from 6s. to 9s. per pair ; turkeys, 10s. 3d. to 19s. each.

Fruit and Vegetables.—Very little fruit offering ; but the market is well stocked every day with almost every description of vegetables.

Sundries.—Beef, 3d. to 7d. per lb. ; mutton, 5½d. to 11d. per lb. ; pork 3d. to 7½d per lb. ; bacon, 6d. to 10d. per lb.

Wood.—Firewood, chiefly wattle poles, has been sold at prices varying between 6d. and 4d. per 100lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44 writes :—

General.—Business is none too brisk, and it will hardly be possible to look for much amelioration until rail and shipping facilities are granted in fuller measure than now obtains.

Mealies.—The market is dull, and there in a marked absence of any considerable moves ment. Small parcels continue to go through to to the Rand and elsewhere, but these play as unimportant part in view of the heavy stock-locked up by speculators and others. The market rate is about 12s. per bag, but this is only nominal, and buyers are not eager.

Forage.—Very fair quantities of Algerian forage are being reaped, but the continued wet weather is all against a fair sample, and scarcely any is fit to put into store. The writer has further testimony from farmers as to the splendid results given by this variety of oat, and it is to be hoped that every farmer in the Colony will plant some ground this summer, and endeavour to prevent, if only in a slight measure, the enormous importation of fodder.

Potatoes.—Importation still supplies all demand, but the growing crop is coming on well, and new early samples are daily brought to market. Quotations are only nominal.

Hay.—This is in great request, and scarcely any is offering.

Mabele.—Good samples are somewhat scarce, and 20s. per bag is readily paid for best qualities.

CATTLE SALES.

During this month J. Raw & Co. have held sales of stock at Howick and Mooi River, the former being a private sale of 184 trek and slaughter oxen, which sold in two lots at £17 10s. and £20 per head.

The Mooi River sale was on account of the Mooi River Farmers' Association, and the prices realised were as follows :—

Wethers, 19s. 6d. and 27s. each ; oxen at £19 and £16 per head ; heifers at £11 10s. each. This was a poor sale, the total amount being £269.

Sales on the Market Square on Saturday mornings during the month have realized :—Cow and calf, £14s. 2s. 6d. ; cow, £12 5s. ; horses, 8¼ gns. to 10¼ gns. ; cows and calves, £20, £12 ; cows, £14 10s. ; oxen, £16 10s. and £19 per head ; horses, 13¼ gns., 10¾ gns., 16 gns., 36½ gns. each.

WOOL.

Mr. Egner reports :—The wool market has opened with an advance of quite a penny on last year's opening of the spring sales. Some allowance should be made, however, for at least ¾d. advance owing to cheaper freights and favourable exchange. This cheap freight cannot be relied on. It is due to the Bucknall line competition, and these favourable rates are only obtainable when the Bucknall line of ships are in port. At yesterday's sale light skirted wools brought from 6¾d. to 7d., whilst ordinary clips realised from 5¾d. to 6¾d. There is a sad falling off in quantity, and I also regret to notice a great strain of cross-bred amongst many of the noted good old clips. Cross-bred wools are difficult of sale at Home, and represent 75 per cent. of the quantities offered. My cables from London do not justify even the prices paid for merinos at this end, and the London brokers' reports by the last mail speak very doubtfully about the future. At the present moment there are available for the next sales not less than 300,000 bales, as against 185,000 for the same period last year. Owing to the rinderpest restrictions, the Maritzburg wool market may show a very serious falling off, as buyers here rely upon at least 2,000 bales from Griqualand East.

The general idea of those who have heard of wild horses is that the master stallion *leads* the herd. This is not the case ; he *drives* them anywhere he desires them to go, for fear the mares may escape or be cut out of the band by prowling stallions. The monarch of the herd guards them with as much vigilance as a sheriff guards a squad of prisoners or a shepherd guards his flock when wolves are hungry and desperate. . . . The master stallion allows no males to remain in the herd after they have attained the age of one year—seldom are there seen more than half-a-dozen stallions herding together. They are usually found alone. Occasionally one dashes in and cuts out a mate from one of the large herds. He is soon overtaken, punished, and the mare driven by the victor with terrific speed into the herd.

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AND MINING RECORD.

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CONTENTS.

Rinderpest.

(*Continued.*)

BY H. WATKINS-PITCHFORD, F.R.C.V.S., DIRECTOR VETERINARY DEPARTMENT.

IN the attempt to place before the reader a review of the various methods and their relative values in the treatment of rinderpest, one remembers that this question was the subject of much diversity of opinion during the last outbreak.

Doubtless opinions then formed were based, in most instances, upon the actual experiences of the time, and the dictates of past experience will not be lightly disregarded.

It must not be forgotten, however, that —urged by the imperious necessity of the moment—the experience gained by most during the last outbreak was limited to one method only, and so prevented a practical comparison of the relative merits of the existing available methods.

An expression of opinion from those who have taken up the question with a mind free from bias, and under circumstances not necessitating immediate or immature conclusions, will be of value and interest to us at the present juncture.

The systems in use to-day with which we are all familiar are two—(*a*) The Bile

System of Minimisation and (*b*) The Serum System, and these are capable of division again into many methods grafted upon the systems as devised originally by the earlier workers with rinderpest in South Africa.

As the method of inoculation with bile is at present being widely adopted in places where an adequate supply of serum is unobtainable, it will be of interest to lay before the reader the various modifications of Professor Koch's original method.

As we remember, Koch's directions were to the effect that bile was to be taken from animals suffering from rinderpest from the sixth to eighth day of the disease. The actual wording of his instructions directed the selection of "an animal, preferably a large one, on the sixth or seventh day after the first rise of temperature, or the fourth or fifth day of visible symptoms." The directions go on to state that this bile "may be kept for a few days" if necessary, that it should be green, sweet-smelling, and without sediment, and that all biles which were not of a green colour should be rejected. Of this fluid 10 c.c.m. were to be injected into the dewlap of the animal to be protected. Professor Koch asserted that thus an immunity would be established on the tenth day at latest sufficiently powerful to resist an injection of 40 c.c.m. of rinderpest blood a month afterwards. The local result of such inoculation would be merely a hard, somewhat painful swelling, the size of a man's fist, which would gradually disappear in the course of a few weeks. Such, briefly, were the instructions issued by the originator of the method, which was applied, on the lines as set down, to hundreds of thousands of animals.

With the extensive application of the process, however, certain disadvantages, or, rather, opportunities for improvement, suggested themselves to certain workers with the disease.

It was stated that by the use of this method the disease became actually introduced into the herd which it was desired to protect. Koch, in one of his experiments, noted that the disease broke out in a herd treated by the above method six days after inoculation, and that of four animals which showed symptoms of the disease three succumbed to it. He suggests that the herd was infected during the operation, and not by reason of it. The question, however, as to whether rinderpest bile is capable of producing the disease in a herd inoculated with it is a very vexed one, and round this point heated controversies have been waged in other places than in Natal. Koch himself stated to the Veterinary assistants sent from Natal to Kimberley to learn his newly-discovered method that bile taken according to the directions could not produce the disease. He further showed that the admixture of equal parts of bile and virulent blood would not produce the disease when introduced into the system of a susceptible animal.

It is proved that rinderpest bile can destroy the virus contained in blood which has been mixed with it, and it would, therefore, seem reasonable to suppose that it could in a like manner deal with any virulent principle contained in its own substance, or, in other words, if the specific organism contained in the blood of rinderpest was destroyed by admixture with rinderpest bile, how could the same organism be supposed to exist in an acting infectious state in the bile itself? In arguing upon this inhibitive or restraining power of rinderpest bile, Koch went so far as to suggest that "bile even from quite healthy cattle" could so modify the virulence of rinderpest blood that a useful vaccine could be produced thereby.

These facts seem to prove clearly that Professor Koch held the view that rinderpest could not be produced by rinderpest bile, and on the strength of his dictum to that effect, bile inoculation was permitted and encouraged (wherever facilities were possible for obtaining such bile) as he directed suitable.

Let us glance at the views entertained by those workers with the disease who have been in a position to gather statistics from extended personal observation.

Dr. Turner, the present Medical Officer of Health for the Transvaal, stated in his address at the International Rinderpest Conference at Pretoria, "he was fully convinced that the gall could not cause the rinderpest" in an inoculated animal, and, further, that "an animal injected with gall is no more able to spread the rinderpest than a child inoculated with vaccine is able to spread the small-pox," although later, the same authority is re-

ported (perhaps incorrectly) as admitting that "the question whether the gall can cause the disease is still an open one." Mr. Henning, Veterinary Surgeon to the late O.F.S. Government, was confident that the disease was contracted in this manner. M. Theiler admitted the possibility in rare instances. A summing up of the experience of all the experts attending the International Rinderpest Conference resulted in the formulation of the following :—"After the inoculation with gall, some animals can get the disease in a deadly form." The views of Dr. Edington are : "Bile can and does produce rinderpest, but certain samples do so more than others."

Mr. Neucki, a Russian scientist, of wide European rinderpest experience, states that animals inoculated with bile sometimes contracted the disease in a fatal form, and so tended to spread the disease. He also states that the disease is produced particularly by the yellow and red biles, and that the immunity resulting from bile inoculation in general is so frail that the method has been disused in Russia. The opinion of the Colonial Veterinary Surgeon of the Cape Colony, in his comments upon the work of anothe robserver, seems, summed up, as follows :—"I thoroughly agree with Drs. Krause in their opinion with respect to the capability of certain fresh biles, under favouring conditions to communicate rinderpest to healthy cattle."

My own opinion in 1898, based upon our then late rinderpest experiences, was expressed as follows :—"Bile inoculation in Natal generally has been condemned in practice as being capable of actually producing the disease which it was to have prevented. This it undoubtedly has done in many instances, contrary to the expressed opinion of the originator of the system, and it was upon this opinion solely that we, in Natal, were guided in the adoption and working of the bile system."

I think it will be conceded that the weight of the above evidence is in favour of the possibility of the disease being conveyed through the medium of bile if inoculated as advocated by Professor Koch.

Such a possibility, of course, proves a grave indictment against the promiscuous adoption of bile inoculation in areas free from the disease. Happily it is possible to overcome an objection so grave to the use of a valuable inoculative material which has proved the salvation of thousands of animals in the past.

(*To be continued.*)

Tree and Grass Seeds.

MESSRS. WILKINSON & CO., at the request of the Department, have stocked *Euc. crebra*, *Euc. paniculata*, and *Euc. siderophloia* ; also of grass seeds *Paspalum dilatatum* and *Panicum maximum*.

Mapstone Oats Notice.

AGRICULTURAL Associations and farmers who have obtained Mapstone oat seed from the Department are requested to return as soon as possible, from that which they have grown, the quantities of seed supplied to them.

Glyerinated Bile.

INFORMATION having been asked for respecting the above the Principal Veterinary Surgeon replies :—

The proportions are two parts bile and one part glycerine. The preparation may be made immediately after the bile is taken from the beast, and should be kept eight days before using.

Glycerinated bile may be expected to keep in effective condition for some months. It is not known definitely, however, how long it retain its immunising powers.

In the western part of French Guinea the tribes are very fond of feather ornaments—on their head, round their neck, and on their cloaks or mantles. The fowls reared by the Indian tribes of Rucagenne are all white, and a coloured feather would be offensive to the owner. Both men and women love to disport themselves in their white feathery adornments. Like fanciers in Britain, the hens are specially raised for their feathers alone, and not for culinary purposes. As a matter of fact, on the White Farm, at Wimborne, Lord Alington has nothing else in his place except white animals, both bird and beast.

Guinea Grass Seed.

A SMALL consignment of guinea grass, *panicum maximum*, seed has been received, and is available, on application, for free distribution in small quantities. The following information is taken from the "New South Wales Journal" :—Guinea Grass is an excellent fodder plant, as has been proved in Jamaica and in the Indies. It is perennial, seeds freely, and in good seasons can be cut four or five times in the course of the year. Cattle and horses eat it readily. In Jamaica one acre of the grass is sufficient to feed two horses and a cow for twelve months, and there it is considered next in importance to sugar-cane. The plant flourishes best in a moist—not too moist—soil, and should be cut when young and tender, unless it is intended for chaff. It is stated that one-fifth of the land in Jamaica is under guinea grass, to the nourishment in which is attributed the fact that there are a much greater number of good horses and good cattle in Jamaica than in any other part of the world of the same size.

On the 18th October, 1890, Mr. T. J. Jephson, of Cobar, wrote the "N.S.W. Agricultural Gazette" :—Some years ago I introduced guinea grass into Central Queensland, and it was found to give large quantities of green fodder and to stand the climate well.

District Reports.

IMPENDHLE, 2nd December.—Although rain fell on thirteen days during the past month, and there were several dull, misty, and cold days, the actual rainfall for the month would have been comparatively small but for steady and heavy rains on the 24th and 30th ulto. The early spring rains this season having enabled the Natives to commence planting much earlier than usual, they appear to be cultivating a greater extent of ground : and if the season should continue favourable, they should reap heavy crops. But the grub has still to be reckoned with, and, unfortunately, it is very bad, and appears to be getting worse every year. All kinds of stock are now in splendid condition, and, so far as I know, no contagious diseases—with the exception of scab—are prevalent in the Division.

CHAS. BOAST, Magistrate.

NDWEDWE, 30th November.—During the early part of the month a very large swarm of locusts were moving about the Location, but did little or no damage to crops, and has disappeared again, Cattle are looking well and free from disease. Natives have now planted most of their mabele crops, and are busy with their other crops. They have a fair quantity of the common red bean planted this year. We have had unusual weather lately—more like that of 25 years ago. The rainfall for the last three months is 15·32 inches, viz. : September, 6·34 inches, in 11 days ; highest fall, 1·10 inches, on the 14th. October, 3·77 inches, in 16 days ; highest fall, 0·54 inches, on the 18th. November, 5·21 inches, highest fall being to-day, 1·10 inches. The temperature during the month has been fairly even ; the thermometer readings are as follows:—Means, minimum, 59 ; maximum, 75°. Minimum, 53°, on 13th ; and maximum, 93°, on the 28th.

WALTER H. ACUTT, Magistrate.

NQUTU, 30th November.—During the month rain fell on twelve days with a record of 2·43 inches—not such a good fall as could be wished for at this period of the season. The mealie and mabele crops are in most instances now above ground, and a good deal of ploughing—for late crops—is still being indulged in. There are still a fair number of Native herds infected with lungsickness, but the efforts of the Stock Inspector to get the disease in hand are proving effective, and were it not for his having been appointed at an opportune time, the District would by now have been teeming with the disease. Towards the month end a suspicious outbreak of disease amongst some Native stock near Telezi Hill necessitated the services of the Government Veterinary Surgeon being called in, and I am glad to say that he has pronounced the outbreak to be of a non-infectious nature, and not, as was feared, the dreaded "Rinderpest." Stock are, generally, in first-rate condition, and grazing for them is excellent and abundant. During the month a heavy hailstorm was experienced, the stones which fell having been extraordinarily large ; fortunately, beyond the young peaches and other fruits, there was little that could be damaged by it. Heavy

winds with, in some cases, duststorms, have been rather frequent throughout the month.

C. HIGNETT, Magistrate.

RICHMOND, 29th November.—After two days of intense heat, on the last of which the heat was accompanied by a high wind, a little rain has fallen, though a very small quantity. There have been a few thunderstorms lately in this District, but as yet none have visited Richmond—most of them having travelled to the East of the immediate neighbourhood before falling. However, during the week previous to this, we had a moderate quantity of rain, and the country round Richmond is looking very well. All kinds of stock are healthy and in good condition; no cases of contagious disease have appeared among them, though several cattle have been ill from eating tulip, in no case, however, with fatal result. The planting of crops is now proceeding fast throughout the Division, in many cases, to replace those previously planted—these having been destroyed by the grub. Locusts have again appeared in large numbers in this Division, and are, I believe, depositing their eggs. I am informed that, upon being unearthed, some of the cocoons have been found to contain a worm—or maggot—which apparently preys upon the eggs; it is to be hoped that many may be destroyed by this means. I hear that the District Veterinary Surgeon (Mr. J. P. Byrne) intends residing permanently at Richmond; this will, no doubt, be a boon to the farmers of this Division.

J. P. WALLER, Magistrate.

UMLALAZI, 29th November.—There is little of interest to record since my last report. Lung-sickness is still in this District, and two fresh outbreaks have been brought to my notice. I am not aware, however, of any other disease amongst stock, except that a few cases of horse-sickness have already occurred in the District. Rain has fallen on seventeen days during the past month, the heaviest being on the 29th, when 1·20 inches was registered; the total fall for the month being 4·33 inches. Thunderstorms have been more frequent, and I regret to say during one last week a Native kraal was struck by lightning, the electric fluid killing three head of cattle; several Natives in a hut received a shock, but happily no further injury. Crops are looking well, and are coming on fast. In some few instances the green mealies are ripe already, but in the majority of gardens have not yet flowered. Locusts are still about, but not in large numbers. They are now depositing their eggs. The decision of the Government to offer a reward for each wild dog killed has been received by the Natives with satisfaction, as the depredations of these animals are not limited to game, but extend to goats and sheep as well, and it is confidently expected that the wise action taken by the Government in the matter will have a decided effect in exterminating these animals. We have had several very hot days lately. On the 28th ult. the thermometer registered 106° in the shade at 9 a.m. and 112° at 11 a.m. This has had the effect of bringing out snakes in considerable numbers, and I regret to say two fatalities from snake-bite were reported to me in one week. Speaking to one of the surrendered burghers in this District on the subject of rinderpest a few days ago, he stated that he had discovered what he believed to be a cure for that terrible disease, and it is my intention to make further enquiries in the matter, after which I shall report more fully upon it. The usually good fishing to be obtained in the Umlalazi River here has been somewhat spoilt during the past ten days by a shoal of sharks coming in from the sea and playing havoc with the fish. A large whale has been observed several times during the last two weeks spouting water a few miles out at sea. A case of suspected chigoe, or jigger flea, was reported, but, owing to the delay in reporting it, the District Surgeon was unable to certify it to be such, the Natives affected having almost recovered before he saw them.

J. J. JACKSON, Magistrate.

WEENEN, 30th November.—A heavy fall of rain took place on the 23rd and 24th, nearly two inches falling in the 24 hours. Since then the weather has been extremely hot; the thermometer registering 101° on the 27th and 99° on the following day. Probably as a result of this geniality on the part of the weather, snakes appear to be more numerous than usual this year. An interesting struggle between a black mamba and a dog was witnessed a few days ago in the Bushman's River, near the village. The dog attacked the reptile on the bank, and on its gliding into the stream followed it up. The mamba twined itself round its assailant, but was eventually killed. With the assistance of the on-lookers—Mr. C. Grant and some natives—both the mamba and the dog were brought to the bank. The latter immediately ran off, and as it has not since been heard of, was presumably bitten, and is probably dead. I have obtained the skin of the snake, which measures over ten feet. An unwelcome patient in the form of an "Umzingandhlu," over four feet in length, was lately discovered by the District Surgeon among his medicine bottles in the Native Cottage Hospital, and was eventually despatched. To complete the record—a python was killed a few days ago near the village, and an iguana, which had apparently sought refuge from the heat, met a similar fate in one of the offices of the Court House, while a black mamba was shot by Mr. Arnold in his verandah. It is remarkable, with so many unpleasant visitors about, that cases of snake bite are not more frequent.

C. G. JACKSON, Acting Magistrate.

I have heard many complaints, says "Arator" in the *Advertiser*, of loss of dogs this season from disease of some kind, and the number of dogs which have died must be considerable. The disease appears not unlike distemper in some respects, and in others resembles the effects of poison. The dogs sicken, lose condition, and either die, or take a long time to get back their condition and sleekness.

Paspalum Dilatatum.

REPORTS ON PROPAGATION.

DEAR SIR,—On 14th Aug. last I planted the *Paspalum dilatatum* seed, and also the twelve kinds of tree seeds sent me from the Agricultural Department. All were sown in beds well dug and lightly manured with ash and bones (dissolved). All have grown, and I have now some thousands of the *Paspalum dilatatum* plants growing healthily. Till you were good enough to send me a young sample plant of the *Paspalum dilatatum* I was not sure of it. I have now removed all other grasses that came up with it, and have a bed 30 ft. by 8 ft. one mass of the plants. I enclose you one plant carefully dug up, and you will see the root has gone down nearly 8 inches, and this after only being sown three months. I think this simply marvellous, and no doubt I may have broken off the very fine end of the root in getting it up. If this grass will stand our frosts it will prove a great boon to us. I have no fear of any drought in this country interfering with its growth. I will report again later, after I have transplanted to the fields. I will also let you know how the various trees grow and stand our climate. those growing are :—Euc. Polyanthema, Euc. Crebra, Euc. Paniculata, Euc. Siderophloia, Euc. Punctata, Euc. Pilularis, Euc. Sideroxylon, Euc. Saligna, Euc. Microcorys, Euc. Hemiphloia, Euc. Resinifera, Euc. Acmenoides.

Yours truly,

PERCY D. SIMMONS.

Bray Hall, Mooi River.

P.S.—If any local farmers care for plants of the *Paspalum dilatatum* and will come for some they are more than welcome.

Ailbury, Ixopo,
24th November, 1901.

SIR,—Seeing the correspondence in the *Agricultural Journal* re *Paspalum dilatatum*, I beg to say that on the 27th of September, 1901, I sowed a patch of seed in drills on clay soil, which was moist but not manured in any way.

I first noticed the grass coming up on the 30th October, and it is now doing well.

On 17th October I sowed another patch on sandy soil well dressed with sheep manure, and saw the first grass up on 5th November. This patch is also growing well.

Yours, etc.,

J. E. COOPER.

The Hon Minister of Agriculture.

Longwood, Ennersdale,
25th November, 1901.

SIR,—As promised, I send you the result of my trial of the *Paspalum dilatatum* seed you sent me.

I tried it under several conditions, and in all cases it was a great success. All was planted in the poorest soil I could find, red sub-soil, the best of my land being but poor. Some I left in the shade for two months, and it did not show any sign of germinating until I brought it into the sunshine, when it came up in two days as thickly as possible. That which was well watered and kept in the sun came up in eighteen days.

I don't find it a fast-growing grass in comparison with many. I planted at the same time some Californian oat grass sent me by Mr. Buttemer, which has grown at double the pace.

I make grass trials a hobby, and I can say I never found a seed germinate better than the *Paspalum* you sent me. Few grasses (with the exception of cocksfoot and Kentucky blue grass will germinate and mature in the shade at an altitude of 5,000 feet.

I should say *Paspalum* is a small millet.

I have transplanted a good quantity without any trouble, and have had no failure. If it will surpass our natural grasses (which, taken all round as a mixed lot, are hard to beat), *Paspalum* will indeed be worth having.

Yours, etc.,

THEODORE WOODS.

The Hon. Minister of Agriculture.

The following is extracted from a letter written by Mr. Frank F. Churchill, M.L.A., to the Editor :—

Since I saw you recently and mentioned that the *Paspalum* was in full seed at the Botanic Gardens, Durban, it has been found growing on the road-side near Hillcrest. Eight months ago my attention was called by Mr. Bennett to a fine stool of grass unlike the native grasses. We watched it during the winter, during which it kept its green colour and softness, and now that it is in seed we have been able to get it indentified by Mr. Wood as *Paspalum dilatatum*

Seemingly it takes to this country, and here, where there is little frost, it keeps green in winter on dry sites, which will make it valuable. I may add horses eat it very readily. The seed I got from Government has now come up well, and the rows are full.

ANALYSIS OF HAY.

The hay, reports Mr. F. B. Guthrie, New South Wales, of which the following is a complete analysis, was supplied from the Wollongbar Experimental Farm, Richmond River : -

Moisture	10·55	...
Total albumenoids	10·31	...
Soluble albumenoids	...	1·38
Insoluble albumenoids ...	...	8·93
Digestible fibre	29·96	...
Woody fibre	27·95	...
Total ash	6·37	...
Soluble ash	...	4·32
Insoluble ash	...	2·05
Amide compounds, chlorophyl, &c. (by difference) ...	14·86	...
Total nitrogen	...	2·66
Nitrogen in amide compounds, &c. ...	...	1·01
	100·00	

I subjoin an analysis of hay from meadow-grass (name unknown) of English source, which will afford a comparison of the value of these fodders. From this it will be seen that the amounts of total albumenoids, and of digestible fibre, which are the chief factors in determining the feeding value of the hay, are very similar, with a slight advantage in favour of the *paspalum* hay. The solubility of the fibre, albumenoids, and mineral matter being, moreover, greater than with the English hay. The most striking peculiarity is, however, the comparatively large amount of nitrogenous matter other than albumenoids. The nitrogen in these combinations is of comparatively no feeding value.

ANALYSIS OF HAY FROM MEADOW GRASS.

Moisture	14·00
Soluble albumenoids	·98
Insoluble albumenoids... ...	7·89
Digestible fibre	28·68
Woody fibre	22·92
Soluble ash	2·20
Insoluble ash	4·66
Amides, &c. (by difference) ...	18·67
Total nitrogen	1·54
Nitrogen in amides, &c... ...	·12

The *paspalum* hay compares very favourably with ordinary hay, containing a larger proportion of digestible and nourishing material.

If both analyses are calculated to dry substance, it will be found that the *paspalum* hay shows the higher albumenoip content, the amount of digestible fibre being almost identical.

Natal Estates.

THE report of the directors of the Natal Estates, Limited, submitted at the sixth annual meeting of shareholders, stated that the accounts to May 31st, 1901, show a net profit of £1,506 8s. 11d., which is mainly owing to the fact during the period covered by the accounts an unprecedented drought prevailed in Natal. The prolonged state of hostilities in South Africa has also militated against the interests of the company, the cost of labour and transport having been abnormally high. The available balance, including £3,748 4s. 10d. brought forward from last account, is £5,254 13s. 9d., out of which it is proposed to distribute a dividend at the rate of 6 per cent. for the year, thus absorbing £4,500, and leaving a balance to carry forward of £754 13s 9d.

Proclamation re Trout.

ON the 25th November a proclamation was issued forbidding fishing, the capture or killing of fish in any of the undermentioned portions of the said rivers :—The Umvoti River from Mr. Geekie's farm down to the second fall ; all of the Edendale River above the Edendale Falls ; the Ipolela River from its source down to the Trappist Monastery, Reichenau.

Rinderpest Reports.

26TH NOVEMBER, 1901.

OUT of six hundred animals treated there have been up to date 85 deaths at Lisbon and Schoon Spruit :—2, three months old ; 6, six months old ; 5, one year old ; 20, two years old ; 7, four years old ; 5, five years old ; 8, six years old ; 1, seven years old ; and 3, eight years old.

This shows that 80 per cent. of the deaths have been amongst cattle four years old and under, and the death rate works out at 14 per cent. The majority of the deaths, of course, took place in the originally infected herds. The average yield of bile per beast has been 28 doses, or 280 c.c.

3RD DECEMBER, 1901.

Lisbon Outbreak.—Since my last report there have been two deaths amongst the sick animals, and the few sick beasts now there are feeding again. No fresh case has occurred.

Tintwa-Schoon's Spruit Outbreak.—On the 29th of November only one animal was sick here, and it is stated to be recovering.

Zand Spruit Outbreak.—One animal died on the 26th November, and three were sick in one of the in-contact herds. This was after the second inoculation. The other in-contact herd is still clean, and the few sick animals in the originally infected area are said to be recovering.

From the above it will be seen that the disease in these three outbreaks is dying out.

Van Reenen's Dipping Station.—The reported outbreak here is undoubtedly rinderpest. Two other animals have become sick since inoculation with bile. No further deaths have been reported.

Kirkintulloch.—There have been four fresh cases since the 26th. One death has occurred since then. At present there are ten sick. Many of these appear to be recovering. I have been unable to obtain any reliable evidence as to the source of infection. I think, however, there is little doubt that the outbreak was caused by the movement of natives' stock.

Reitfontein.—On the 29th of November a fresh outbreak occurred amongst the cattle of Messrs. Pepworth and Reid on the farm Reitfontein, about eight miles north-east of Ladysmith. Only one animal was sick. Messrs. Pepworth and Reid have inoculated their cattle (about 1,350 head) with bile. The source of infection in this case is probably from the farm Kirkintulloch.

(Signed) S. B. WOOLLATT,
Principal Veterinary Surgeon.

3rd December, 1901.

Locusts Report.

MR. STOCK INSPECTOR S. A. BROWN, Lower Tugela, reports :—

Locusts have been passing from Zululand during the whole of November. About the 13th of the month they started to lay their eggs, and between here and Stanger they have laid thousands of eggs. I am glad, however, to say that the wet weather has destroyed a good many of their eggs, and I have been told that there is a maggot which starts to eat the eggs as they are deposited in the ground. I found a certain piece of ground about an acre in extent, and in this particular place all the grasshoppers have been dying from a disease something similar to the fungus. I forwarded a parcel to the Principal Veterinary Surgeon some time back for his inspection. I have not seen any of the locusts dying so far. If the wet weather continues, it will be a good chance to introduce the fungus among the young hoppers when they are hatched.

The Shorthorn bull calf sales in England have again achieved remarkable success. Mr. Duthie's top price was 650gs., given by Sir W. H. Willis, Bart., of Bristol. The average of the Collynie lot was £157.

In New South Wales, the most practicable means of rendering the spines of prickly pear innocuous to cattle has been shown by Mr. W. L. Boyce to be the silo. After a few months the spines become quite soft, and the ensilage thus produced is both nutritious and palatable.

Natal Stud Farm.

INTERVIEW WITH MR. P. D. SIMMONS.

By ERGATES.

(*Concluded.*)

SHEEP.

"How about your sheep?"

"For four years I farmed merinos, but the results were indifferent. I then came to realise the fact that improvement in wool would not be so paying as getting a considerable increase in meat. By going in for Shropshires I can safely say that I have raised the value of my sheep 10s. a head all round. I find them hardier, very tractable, and more contented in disposition. My wethers I never experience any difficutly in selling at 35s.; from 4-tooth upwards they all run over 60lbs. On one occasion I sold a pen of wethers at 50s. each."

"Do they get extra food?"

"No; they do not; they run on the veld. The only sheep that get help in the winter are the rams and the winter lambing ewes."

"What is the best time for lambing?"

"For this district the month of July, in my opinion. Those lambs get a good start before the rough cold rains of September. Of course there is always a good bite of grass in this district at the beginning of September, but the ewes, if they have not been fed, have by then run down low in condition, and if the September should be a wet and cold one as the last has been, the chances of a good crop of them are poor. As you know, most people in this district have their lambing in the month of September, and their losses this year have been enormous. Shropshires give less trouble than merinos. Mine lamb in the veld, and are then—July—put on the cultivated grasses. I also wean the lambs on those grasses. The Shropshire is compact and symmetrical, and he is the best for wool of a Down type. Up to two years ago I got as good a price for my wool as the growers of the best merino, but since then the cross-bred has sold at from 1d. to 1½d. less. The fleeces on the average go slightly over 5lbs. I once experimented with an Oxford Down, but the result was too loose and angular for this country. Every year I have an increased demand for rams, and what is most satisfactory to me, the orders are generally repeated year after year. People are now buying rams from me who previously strongly believed that the merino only was suitable for this country. By the way the serving works out at a very low cost if one goes in for a July as well as a September lambing. I use my rams twice, resting them and feeding them after the first service, and put them with the ewes again in April."

"Do your best lambs die much in January?"

"No; not now. The mortality among lambs in that month is, I believe, due to heat. You know how they get in clumps hanging down heads together when they cannot get shelter from the sun's rays. Well, in all my paddocks there are wattle plantations into which the sheep can and do go to escape from the rays of the sun. A drawback to the trees is the falling off of dead bark, which gets into the wool of a Shropshire—a disadvantage in this respect when compared with the close wool of a merino. I also dose the lambs with opening medicine, and follow it with a tonic. In the licks I give sulphate of iron, also sulphur and lime.

PERSIAN SHEEP.

Previous to the Boer invasion Mr. Simmons was a breeder of Persian sheep, there being a good demand for the rams among the low veld farmers. The Boers took all excepting one ram and four ewes. Where kafir sheep only can live, there the Persian is in demand for crossing.

"I am again," he said, "grading up a flock by using Persian rams on kafir ewes, for Persian ewes are now unobtainable in this Colony. When the war comes to an end I shall again get more Persian ewes from the Cape. I found the rams which I bred sell well. People on the low veld should, in my opinion, go in much more than they do for these types of sheep."

Berg Land.

"You have had some ten years' experience of land under the Berg; is it good, and what are the characteristics?"

"My farm there is sheltered by precipitous spurs of the range, some 1,500 ft. higher than the valleys; some of the heights are 6,500 ft. above sea level. When the winds are cold here, the sheltered valleys there are perfectly still and warm. The grass is coarse, but it keeps well into winter, and I think it will improve in quality by grazing. I was the first of this district to winter there. Previously the Berg was associated with all that is cold and trying to stock in winter, whereas it is now recognised that the climate of its kloofs is beautifully mild at that trying time of the year. The sugar bush is common, and in some of the gorges there is bush—yellow-wood and umbomvan. In the Putini location there is plenty of bush. Very little of the land can be ploughed, but it is good stock country for the early winter months. My farm is near the Bushman's caves best known to the public. On my farm there is one of these caves which contain's plenty of Bushman's drawings—lions, elephants, antelope, and an animal, sitting up, which bears a strong resemblance to the Australian kangaroo.

Grasses.

One of the most interesting features of Bray Hill is the cultivation of imported grasses. All the bottom land, and there is plenty of it, is under these grasses or is being prepared, or is destined eventually for that purpose. Nowhere did I see grasses put into top land, though in such land, with yard and artificial manure, Mr. Simmons grows good crops of mealies, millet, roots, cabbage, etc. Very shortly, in the black bottom lands, he will have 200 acres of imported grasses.

"Which grass do you prefer?"

"I believe, as a rule, in mixtures. The seed I buy separately, and I do my own mixing. A good mixture is equal parts Italian rye, cow grass, a little trefolium, white Dutch clover, rib grass, cocksfoot and burnet. The paddock we are now in was sown with that mixture four years ago. You see what a splendid growth there is, and yet last winter all was grazed down to the very ground. The Italian rye grass gives magnificent rich heavy growth for a couple of years, and then becomes short, resembling English rye. Sweet vernal I tried on a considerable scale, but as I found the cattle did not like it I have given it up. Except for scenting hay it is of little value. Trefolium clover is considered a first-class green feed in England, and when holdings become smaller here I think it will be a favourite. Burnett keeps green through the winter, but stock do not eat it until the tail-end of that season. All the yard manure that can be spared goes to the grass paddocks, also all good road sweepings that can be got. In preparing the soil I do my best to get it into fine tilth. After, say, two ploughings, I thoroughly harrow it and roll it with a weighted Cambridge roller. This last operation is done most effectively. If the soil is well broken up it is almost impossible to roll it down too hard—a fact which a good many people do not know. I sow by hand. The advantages of imported grasses are innumerable for stock farmers. I have had practically every crop smashed down past recovery by hail, but the grasses at the worst are injured for only a few days, however bad the hailstorm may have been. Then when they are once in, the work is done with—at any rate for several years. Again, they permit of a great increase of stock. A man well provided with such pasture can easily, I am convinced, run ten sheep to the acre. Last November, when I sold a lot of mares to the military, I put their foals, only six to eight weeks old, into this paddock. I did not lose one, and they all did well; as well as those left with their dams. Then the hay from these grasses is splendid—altogether a different thing from the ordinary veld hay."

"When do you plant?"

"From December till early March if the weather is favourable; when the weather is hot and dry I do not plant. This being an exceptional year I am planting in November. I am experimenting this year in varying the proportions of the seeds. Cow clover does best in strong, drained marsh-land; cocksfoot does fairly well on light soil, and if manure is given I am sure it will be a thorough success. There is no need to manure marsh-land for English grasses."

BARK.

"When I came here there was an impression that the locality was too cold for the mollisima wattle, but I gave them a trial, and they have done capitally. About 150 acres are in, and I intend in future to plant some fifty acres every year as long as I have the land to spare for this purpose. The most are in strips, the primary purposes of which are to serve as fire-breaks, as wind-breaks, and shelter from the sun. I have planted in the open, without fencing against stock, and the prophecies of my neighbours that the trees would always be broken down and never get away, have not as you see, come true. Of course an open plantation in a small enclosure would suffer badly, but where stock have plenty of room the damage done is by no means serious. The strips are from 10 to 15 yards wide. The bark cutting is made over to a contractor, who does all the work on shares.

POULTRY.

"The best all-round farm bird," said Mr. Simmons, "is the Plymouth Rock, in my opinion. I have always kept to that breed after trying most of the other breeds. Birds bred here have beaten imported ones at shows, the well-known Mr. Cook being the judge. I have started hatching by incubators—Abbot Bros'."

CONCLUSION.

In many respects Bray Hill is a specially interesting farm. Not only does a visitor see model stock, but he is entertained by one whose energy and enterprise are exceptional If the owner thinks a departure feasible he spares neither money or pains, and in several directions he has proved that things previously thought impracticable are practicable and profitable. One of his latest projects is the growing of osiers along his river boundary. He argues that there is a great and growing demand for baskets in the Colony, and as Indians are particular adepts at basket work, the growing of the osiers should prove profitable. For this river reach, some one and a half miles in length, he is breeding English wild ducks. The barns are large and well arranged, and the crushing of mealies and cutting of forage, etc., are done by horse power. The large and profitable business now done every winter with Durban, Maritzburg, and elsewhere in cabbages was started some ten years ago by Mr. Simmons The stockyard has a curious feature, two sides of the enclosure being made of the "horse boxes," in which he he has imported live stock from England. Mr. Simmons never dwells on failures or difficulties. Everything connected with farming he regards with cheerful, encouraging optimism. For farming at average all-round prices realized during the last ten years there is no country in the whole world, according to his opinion. that equals Natal. The sanguine views which he expressed in a letter which appeared in the first issue of the *Journal* he still holds to firmly. A visit to Bray Hill would be the best prescription for any who are suffering from an attack of despondency arising from losses in stock, drought, hail, locusts, labour troubles, or such like afflictions.

Agricultural Chemistry for Beginners.

CHAPTER II.

By ARCHIBALD PEARCE.

OXYGEN, HYDROGEN, ACIDS, AND BASES.

HAVING somewhat cleared the ground, we shall now proceed to describe two of the elements named, selecting Oxygen and Hydrogen first, because they enter into the composition of so many other substances, and in describing them we shall pave the way for the understanding of certain important classes of their compounds.

OXYGEN.

Oxygen is a gas which is so widely found in Nature that in the free or un-

combined state and in its compounds it forms about half the entire weight of the world. The air we breathe consists chiefly of a mixture (not a compound) of oxygen and another gas called nitrogen, the former making up about one-fifth of the total volume; eight-ninths of water by weight is oxygen; and it forms a greater or lesser part of the majority of the rocks of which the earth is composed. It is a very active element, combining readily with most other elements, and the compound formed when oxygen unites with another element is called an *oxide* of that element. Thus the oxygen of the air combines with iron, forming iron oxide, which we know by the name of rust; oxygen and phosphorus form phosphoric oxide; oxygen and calcium, calcium oxide or lime; oxygen and hydrogen, hydrogen oxide, which is water. It is the oxygen of the air that enables things to burn; the burning of a candle, for instance, is in fact the combination of the oxygen of the air with the carbon and hydrogen of the grease. The various oxides are of great importance, and some of them will be referred to later on.

Hydrogen.

This element is another gas, and the lightest of known substances, being 15 times as light as air. The next time we want to make some "killed spirits" for soldering, let us put the pieces of zinc and spirits of salt into a wide mouthed bottle (not too large), and cover the mouth loosely with a piece of paper. After the effervescence has proceeded for a few minutes, apply a light to the mouth, and we shall either get quite a loud pop, or a bluish, almost invisible, flame will burn at the mouth of the bottle. The gas which causes the effervescence is hydrogen; if it has completely filled the bottle it will burn quietly, if it is still mixed with air it will explode. In both cases the application of flame has caused the hydrogen to combine with the oxygen of the air and form water, which is, as explained above, the oxide of hydrogen.

Acids and Bases.

We shall now be in a position to understand the constitution of a large and important class of compounds termed acids. These are distinguished by a sour taste like vinegar or lemon-juice, by the power of reddening paper dyed blue with litmus (a colouring matter extracted from certain kinds of lichen), and *by always containing hydrogen that can be replaced by metals.* For instance, sulphuric acid consists of hydrogen, sulphur, and oxygen; if the hydrogen is expelled and its place taken by iron, so that the new compound contains iron, sulphur and oxygen, we get what is called a *salt* of iron and sulphuric acid, to which the name of iron sulphate is given, and all compounds of metals derived in this way from sulphuric acid are called sulphates of those metals. Similarly, nitric acid contains hydrogen, nitrogen and oxygen; if the hydrogen is replaced by the metal sodium we get sodium nitrate (nitrate of soda), and all such derivatives of nitric acid are called nitrates. In the same way, from phosphoric acid we obtain salts called phosphates; from carbonic acid, carbonates; from silicic acid, silicates; and from muriatic acid, muriates: the latter acid is, however, now more properly known as hydrochloric acid, and its salts as chlorides. It differs from the other acids named in containing no oxygen. When we were preparing our soldering fluid just now, what really happened was this: the metal zinc turned out the hydrogen from the spirits of salt (which is the popular name of hydrochloric acid) and took its place, forming the salt of zinc and hydrochloric acid, namely, zinc chloride, thus:

We had at first—

Hydrochloric acid and *Zinc*

composed of

hydrogen } and zinc.
chlorine }

What was left was

Zinc chloride and *Hydrogen*

composed of

zinc } and hydrogen.
chlorine }

It is plain that one acid can form a number of different salts, according as the hydrogen is replaced by various metals.

Most acids are formed by the combination of certain oxides with water; thus sulphuric acid is the result of an oxide of sulphur combining with water; and such oxides have the name of *acid-forming*

oxides, or *anhydrides*, given to them. They are chiefly the oxides of non-metals. Most of the oxides of the metals, on the other hand, do not cause the formation of acids, but if they are brought into contact with acids they produce salts, identically the same as those formed from the metals themselves. In this case, however, no hydrogen is set free, but it combines with the oxygen of the oxide instead, forming water. This will perhaps be clearer if we illustrate the reaction which occurs when iron oxide acts upon sulphuric acid with the consequent formation of sulphate of iron.

Before re-action we have—

Sulphuric acid and *Iron oxide*

hydrogen, sulphur, oxygen } and { iron, oxygen.

After reaction we get

Iron sulphate and *Water*

iron, sulphur, oxygen } and { hydrogen, oxygen.

Oxides of this kind are called *basic oxides* or *bases*. When so brought into contact with acids they *neutralise* them; that is, prevent them having any action on litmus paper, which is the usual test for the presence of an acid. This is expressed by saying that most salts are neutral to litmus; this rule, however, has a good many exceptions.

Below are a few simple questions on the foregoing, to enable anyone to test his grasp of the subject so far.

1. The ancients used to call earth, air, fire, and water the four elements. Were they right in so doing?

2. What are the chemical names of water, lime, spirits of salt, iron rust?

3. What weight of oxygen is contained In 36lbs. of water? How much in 10 cubic feet of air?

4. Explain exactly the connection between an acid and a salt.

5. If calcium oxide were acted on by sulphuric acid, what substances would you expect to be formed?

6. Mention two other names by which hydrochloric acid is known.

7. What is meant by a sulphate?

8. Why is hydrogen sometimes used to fill balloons? If you were asked to make some, how would you proceed?

9. How would you try and find out whether a certain soil was acid or not?

(*To be continued.*)

Sheep-stealing.

By MORRIS A. SUTTON.

AS this matter is ever with us, a few remarks on what is known as district responsibility, as a means of preventing the crime, may not be out of place. At the outset we may at once admit that sheep-stealing is one of the most difficult things to stop, and even in England, until recent times, the punishment on conviction was death, showing that even in a closely settled country severe measures were needed. District responsibilily has long been advocated by sheep-farmers who were at their wits end for a means of preventing this crime, and now that it is the law of the land I propose to say a few words as to the steps necessary to get it put in force.

The first thing the sheep-farmer must see to is that he keeps a proper list of sheep or other stock, and a true record must be kept of actual counting of such stock, made at intervals of not less than one month; all deaths or sales must be duly entered. This will commend itself to all careful farmers, and it is obvious that some such course is absolutely necessary in order to show conclusively that due care has been taken and reasonable attention paid.

When sheep are being stolen, and the owner can find no trace or evidence in the matter, it is first necessary to give a written notice either to the Resident Magistrate of the Division or to the police

showing his loss and giving the name or names of the head or heads of kraals suspected. The police will then make a search of the kraals suspected, and should there be no evidence forthcoming of sheep having been stolen, the owner will be required to make an affidavit as to his losses. The Resident Magistrate then holds an enquiry, and it rests with him as to the steps that are next taken.

Should the Resident Magistrate decide to put district responsibility into force, he then gives notice to the heads of the suspected kraals that they will be held responsible if any more sheep are stolen and there is no evidence forthcoming to convict the thief.

If after the foregoing notice to suspected kraals any sheep are stolen within 12 months' time, the owner must make an affidavit to that effect, search will be made by the police, and should the thieves not be found, the heads of kraals then become liable for the loss.

District responsibility has been enforced in Lion's River Division on several farms, and, in most instances, with excellent results. In one case a thief was caught in the act by a member of one of the kraals responsible, and in two other cases the thieving ceased.

I believe district responsibility has lately been enforced on two farms. One of these farms has no natives on it, and yet, between June 8th and September 7th, there were 46 sheep missed; no portions of stolen meat were found, but the owner could prove to the satisfaction of the Resident Magistrate that the sheep were stolen, and could not be found dead or alive, and that they had gone in small numbers. Some 32 natives living on seven adjoining farms are concerned in this district responsibility case.

What can be done in one Division can be done elsewhere, and I wish to draw the attention of sheep-farmers to the foregoing cases.

With our reduced stock of cattle and rinderpest likely to pay us another visit, farmers look to sheep to help them out of their losses caused by cattle diseases, and I regret to have to say it, but of late several flockmasters have either greatly reduced their flocks or have sold out altogether for no other reason than sheep-stealing.

There are many suggestions as to remedies or prevention, notably one from Ixopo, as to a system in Griqualand East, where a special body of detectives acquainted with native customs and language are employed; there was a suggestion that it might be tried on a small scale in Ixopo District; I am not very hopeful about this, but still it might be worthy of a trial in some form. Again, it has been pointed out that from sunset to dawn no one moves abroad in country districts, and a native has full swing, with very little chance of detection. But to my mind a fair trial of district responsibility offers the most hopeful solution of a great difficulty, and I want sheep-farmers in general to know that it is being enforced, and to strive to get it enforced in a more general manner, for I think stealing goes on more or less in the majority of sheep runs.

When sheep are sold to natives the skin should always be returned, as then, should skins be found, it will be valuable evidence; nor should skins be given or allowed to be taken by natives for any reason. I give below the portion of the Cattle Stealing Law which deals with district responsibility, and I trust the foregoing remarks may be of some use to sheep-farmers :—

Part VI.—Responsibility of Suspected Kraals.

43. Where the cattle of any person have been stolen or killed, and the delinquent cannot otherwise be discovered, but such person shall suspect the delinquent to be an inhabitant of one or more neighbouring kraals, he or some person on his behalf may thereupon give either to the Magistrate or to a member of the Natal Police Force (who shall transmit the same forthwith to the Magistrate) a written notice of the stealing or killing of his cattle, and of the kraal or kraals suspected, and thereupon the Magistrate, if satisfied by the affidavit referred to in the next section, or by further enquiry, that there is reasonable ground for suspecting such kraal or kraals, shall forthwith give, or cause to be given, a notice to the head or heads of such kraal or kraals that it is suspected that such stealing or killing has been done by an inhabitant of such kraals or one of such

kraals, and that in the event of any more cattle belonging to such person being stolen or killed, and the offender not being discovered, such head or heads of kraals may be made liable to pay a penalty of the value of the cattle stolen or killed.

44. The person whose cattle have been stolen or killed shall in every case, in addition to such notice, also lodge as soon as may be with the Magistrate or member of the Natal Police Force an affidavit setting forth the number, character, and description, so far as possible, of the cattle stolen or killed, the date of the stealing or killing, the effort to discover the offender, and the name of the kraal or kraals suspected ; and any person making any wilfully false statement in any such affidavit or notice shall be deemed guilty of the offence of perjury.

45. If after such notice has been given by such Magistrate to the head or heads of kraals, other cattle of the same person shall, within one year from the date of such notice, have been stolen or killed, such person shall, as soon as possible, if desirous of having the benefits of this Act, deliver to the Magistrate or a member of the Natal Police Force a like notice of such further stealing or killing and a sworn statement in the manner provided in the preceding section, and thereupon such Magistrate, if satisfied that there is reasonable ground for suspicion, shall give or cause to be given notice to such head or heads of kraals that further cattle of the said person have been stolen or killed, and that failing the discovery of the offender within a reasonable period to be fixed by the Magistrate, not being less than one month, such kraal head or heads may be subjected to a penalty of the value of the cattle stolen or killed.

46. Any member of the Natal Police Force to whom any notice is given under this Act shall take a copy of such notice and forward the original forthwith as soon as possible to the Magistrate within whose jurisdiction the kraal or kraals suspected may be.

47. Where the suspected kraals lie within more Magisterial Divisions than one, any Magistrate within whose jurisdiction any kraals may be shall have power to deal with the matter in the same way as if all the suspected kraals were within his jurisdiction.

48. If within the period appointed by the further notice the offender has not been discovered or compensation has not been made, the Magistrate may, without any formality of procedure, but in the presence of the kraal heads, enquire into the case.

49. Upon receiving a report from the Magistrate that he is satisfied that any of the inmates of the suspected kraals committed the theft or killing, or had a share in it, or knew of it and took no steps to bring the offenders to justice, it shall be lawful for the Governor in Council to impose upon the heads of each of the kraals so implicated a penalty, apportioned among them as may be considered proper up to the value of the cattle, and the cost of the search and inquiry. Any such penalty shall be paid to the general revenue.

50. Such penalty may be awarded against any one or more of such kraal heads, and where the penalty is awarded against the heads of more than one kraal, such kraal heads shall be severally as well as jointly liable, unless the Governor in Council shall otherwise apportion their mutual liability.

51. Where the stealing or killing of further cattle shall have taken place more than one year, but less than three years, from the date on which the first notice shall have been given, then a further notice may be given as provided in Section 45, and the provisions of Sections 47, 48, and 49 shall apply, except that a penalty shall only be awarded against the head or heads of the suspected kraals in case the Magistrate shall report that he be fully satisfied that the inhabitants generally of the kraals were directly implicated in the stealing or killing of such cattle.

52. This part of the Act so far as concerns stolen cattle shall not be applied in favour of any person who shall not have kept sufficient lists of the class or classes of cattle from which thefts have occurred during the period relating to the question at issue, and no such lists shall be deemed sufficient for the purposes of this part of the Act unless they contain a true record of the actual counting of such cattle made at intervals throughout such period of not less than one month.

District responsibility is, I believe, no new thing, nor can the sheep-farmer of Natal claim originality in this matter. The same thing exists in England in some of the manufacturing districts, where cotton goods are left in the fields to bleach for some time, and where detection of theft is almost impossible. I believe the system gives security where no security was before possible, and I would commend the matter to the grave attention, not only of our sheep-farmers, but to those who administer our laws.

Peach Leaf-Curl.

EXOASCUS DEFORMANS, FUCKEL.

By CLAUDE FULLER, GOVERNMENT ENTOMOLOGIST.

PEACH leaf-curl is a fungus disease which is much in evidence this spring, having been observed by the writer from the Coast to the Berg. It is claimed by most authorities that the disease is due to climatic conditions, and that variations in temperature and humidity have much to do with the appearance or absence of the trouble. Like the Black Peach Aphis the "curl" has undoubtedly been more severe this spring, and I can advance no better evidence to this effect than the fact that not a single instance came under my observation in the spring months of 1899 and 1900, though I had been credibly informed of its existence in the Colony for the past ten years. Considering the early rains which have accompanied the opening year, and the continued variations of temperature from hot sultry days to dull cold ones, all experienced in the course of even a week, it would appear that the contention referred to is reasonably correct.

The disease, however, is not due to climatic conditions, but to a fungus parasite which is, of itself alone, responsible for the injury done to the tree, but the propagation of which is dependent upon climatic conditions, or, in other words, the foliage and new growth of the peach is particularly susceptible during wet seasons, and as wet seasons favour the growth of fungus parasites, as a consequence the attack is more severe and pronounced.

Peach leaf-curl is a fungus known as *Exoascus deformans*, which has a particularly characteristic effect upon the foliage and new growths of the peach and such other fruits as it attacks. In Natal I have observed it so far upon the peach, plum and nectarine, but in other parts of the world it has been recorded upon the almond and apricot as well. The popular name of the disease has reference, of course, to the curled and mishapen foliage which follows the attack of the fungus, and which is more or less roughly indicated in the accompanying sketch. The

PEACH LEAF-CURL.

fruit and tender shoots are also attacked by the parasite as well as the foliage. Soon after the leaves are invaded they become thickened and crumpled in shape owing to the damage done to the cells by the fungus. Leaves so attacked do not usually retain their green colour long, but assume a rosy pink or yellow colour. Subsequently they become sickly and drop from the tree, particularly when the attack is severe. In mild attacks, how-

ever, I have known affected leaves to hang for a considerable time. The blighted twigs also become swollen, distorted, and usually curved, whilst the fruit assumes a blotched and blistered appearance where the fungus has invaded the cells, and usually falls without maturing. The fruit of nectarines seems more susceptible to attack than that of the peach.

The principle features in the natural history of this pest are easily grasped by the farmer who has some conception of the nature of fungus parasites, a subject which I have already dealt with in these pages. At the risk, however, of being considered wordy and wearisome, I will briefly recapitulate some of the more important features as they apply to this disease: If a piece of badly diseased foliage be inspected carefully, and an examination made with a magnifying glass, a floury coating will be noticed upon the affected areas. This has the velvety appearance of the bloom upon a plum, and is due to the fruit of the fungus which has burst through the skin of the leaf. This fruit is carried about by many agencies, and spreads the disease, particularly in the early spring, to a great extent That part of the fungus which lies within the tissue of the leaf, and which produces the spores, is known as the *mycelium*, and may in a general way be likened to the roots of a plant. It is this mycelium, of course, which does the mischief, and like a number of our native plants which are killed off by the frost of winter only to start growing from the roots again in the spring, the mycelium has also the property of resting over from season to season in the wood of its host plant, and producing a fresh outbreak of disease and a crop of spores in the spring.

The knowledge of this feature has long been in the possession of students, and the opinion was held that this resting mycelium or root of the fungus in the tissues of the tree was the principal cause of the disease. As a consequence, little hope of freeing a tree from the pest has been held out by many authorities in writing upon it.

Fortunately, however, we are now much better informed since the disease has been thoroughly elucidated by Professor Newton B. Pierce, Pathologist in charge of the Pacific Coast Laboratory of the United States Department of Agriculture. Professor Pierce's work and observations are summarised in book form and published by his Department, the report covering some 200 odd pages. A few of this author's remarks and his summary are appended for the guidance of farmers troubled with the pest.

Professor Pierce pertinently says that the losses from the disease, amounting to several millions of dollars annually, in the States, together with the obscure views held by many fruit growers and the total lack of preventive measures, made desirable the work which he carried out. He claims, as the result, that a thorough knowledge of the disease, coupled with preventive measures, will save all this immense amount of loss and, further, that the disease may be prevented with an ease, certainty, and cheapness rarely attained in the treatment of any serious plant diseases. The conclusions arrived at are based upon an immense amount of evidence. Over 1,600 peach growers were asked to test the treatment recommended, and so much of this experimental work was done by the fruit growers that it resulted in a saving to the country in one year of three-fourths of a million dollars.

Summary of Work and Observations on Peach Leaf-Curl.

By Newton B. Pierce.

1. Peach leaf-curl has a world-wide distribution, occurring in every region in which the peach is grown. In humid localities it is a leading hindrance to peach culture, and in portions of the Pacific Coast States it has greatly limited the extent of the industry.

2. The orchard losses from peach leaf-curl vary from a small amount of fruit to an entire crop, while in many instances young trees are killed. The national losses from this disease will amount to 3,000,000 dols. annually.

3. Curl is caused by a parasitic fungus known as *Exoascus deformans*, the ravages of which are largely dependent upon the atmospheric conditions prevailing while the trees are leafing out. Rains and cold weather at that time tend to increase the severity of the trouble by favouring the growth of the parasite and interfering with the proper functions of

the host. For these reasons orchards near large bodies of water and in low or damp situations are more subject to curl than those in dry regions or in elevated situations.

4. Most of the spring infections of peach leaves are due to the spores of the fungus and not to the perennial mycelium, as formerly held, hence the efficacy of sprays.

5. Curl was first successfully treated in California during the period from 1880 to 1885, the success depending upon the application of fungicides to the dormant trees. The disease was not successfully treated in Europe for ten years after its prevention in the United States.

6. The copper sprays are now found to be more effective than the sulphur or other sprays first used. Of the various sprays experimented with, Bordeaux Mixture, in the proportion of 5 lbs. copper sulphate, 5 lbs. of lime, and 45 gallons of water, gave the best results, the equal weights of the copper sulphate and lime being most effective when the mixture is applied shortly before the opening of the blossom buds. When it is desired to increase the durability of a spray by increasing the proportion of lime, the application should be made earlier or equal proportions of copper and lime should be maintained. The total saving of foliage increases with the increase of copper sulphate when the amount of lime remains constant, but the average saving per pound of copper sulphate decreases the increase of copper used.

7. In the treatment of the peach leaf-curl, from 95 to 98 per cent. of the spring foliage was saved by spraying. A net gain of 600 per cent. in foliage over that retained by adjoining unsprayed trees resulted in the case of several different sprays. Bordeaux Mixture, when applied to the dormant tree, increased the weight and starch-producing power of the leaves, and the sprayed trees showed a great gain over the unsprayed in the number and quality of the fruit buds they produced for the following year, the gain in the number of spur buds being over 100 per cent. in some cases. The lower limbs of sprayed trees showed a marked gain over those of unsprayed trees as compared with the upper limbs in both the number of fruit buds and lateral shoots they produced.

8. The average value of the fruit per tree in rows treated with the most effective Bordeaux Mixture ranged as high as 6 20 dol. above that per tree in adjoining untreated rows, or the equivalent of a net gain of 427·80 dol. per acre where trees are planted 25 by 25 feet. Over 1,000 per cent. net gain in the fruit set has resulted in the use of some of the more effective sprays.

9. The trees should be sprayed each season, as the experiments proved that treatment one season will not prevent the disease the following year. Spraying should be done even though the trees may not be expected to bear, as the loss of the crop of leaves is shown to result in as great a drain upon the trees as does the maturing of one-half to two-thirds of a crop of fruit.

10. The work demonstrates that peach leaf-curl may be cheaply and easily prevented in California, in Western Oregon, and Washington, and along the east shore of Lake Michigan, where curl causes great loss, as well as in all other peach-growing sections of the United States.

11. The copper and lime sprays are less injurious to the trees than those composed of sulphur and lime. The use of lime in winter sprays has proven an advantage in enabling the workmen to see their work and complete it with greater thoroughness than would otherwise be possible. A proportional increase of both lime and copper sulphate is recommended for wet regions, and for very wet localities a second winter spraying is advised.

12. Cyclone nozzles with lateral or diagonal discharge are best adapted to the work.

13. The proper time for winter spraying and the number of applications depend to some extent on the locality, season, etc., but active sprays are likely to do most good if applied from one to three weeks before the opening of the blossoms in spring. The proper time to apply sprays for the prevention of curl is in dry, calm weather, and during the middle of the day, in order to avoid dew or frost upon the limbs as much as possible.

14. Of nearly two hundred peach and nectarine varieties considered with a view

of determining their comparative susceptibility to curl, it was found that very few were wholly free from the disease, and that some were very subject to it. Some of the choicest varieties, as the Elberta and Lovell, are seriously affected; but it has been demonstrated that a single winter treatment will prevent the disease upon even these varieties. It may be thus fairly claimed that the spraying methods recommended will save to the peach industry some of its finest varieties, as well as result in the saving of foliage and crops already indicated.

Mapstone Oats: Further Reports.

THE following reports are published for general information. Remarks by the Government Entomologist are appended to some.

E. B. GRIFFIN, WILLOW GRANGE.

I beg to hand you the result of my trial of the Mapstone oat.

I was only able to get 20 lbs. of this seed, which I planted on the 27th of March last, covering just half an acre of land. This seemed at the time a very thin plant, but I had determined to make the most of my lot of seed. I planted on the same day, and adjoining, a field of Cape oats. These I reaped five weeks earlier than the Mapstone, but it must be remembered that the Mapstone was planted very thinly, and, of course, had much more room to spread, which it certainly did, as it was some weeks before I could notice any tendency to upward growth.

On the side the Mapstone touched the Cape (and as the former was ripening), rust appeared slightly, but so little and too late to injure the crop. Had I been growing it for forage, it would have been harvested perfectly free of rust.

Treatment.—The land was manured with kraal manure three years ago for mealies, and nothing in the shape of manure since. The last crop grown was barley, cut green. The land was twice ploughed, harrowed, and rolled. I was able to irrigate twice during the winter, after which the spring rains came and brought the crop on to perfection.

Standing about three feet high, nice and level, it looked very pretty.

For a few weeks I had to keep a boy to drive the birds which were very troublesome.

Reaping took place on the 28th of October, the oat having taken just seven months to mature. This is due chiefly to the very thin plant, and also to its being grown in the winter or cold weather.

The result is as follows:—10½ bags of clean seed weighing 1,276 lbs. net; 15 bales of threshed straw weighing 1,724 lbs., making a weight of 3,000 lbs. off the half acre.

Value of the crop is, I consider, about £20, as the seed should be worth 30s. per 100 lbs. and the straw £3.

I intend planting a few bags shortly, and will then know its value as a summer oat.

NOTE BY THE ENTOMOLOGIST.

I examined Mr. E. B. Griffin's crop of Mapstone oat on 23rd October, and found the crop just ripening, and whilst not standing much more than half the height of the Mapstone in the Fox Hill District, nevertheless gave promise of an excellent return of seed. The field of Cape oat mentioned by Mr. Griffin had then been cut, but what green stubble there was and late plants had plenty of rust upon them, some particularly rusty plants growing quite adjacent to the Mapstone. As reported by Mr. Griffin, along the side adjacent to the Cape oats and penetrating into the field, from two to four feet, the Mapstone had taken the rust in the stem. With the exception of this narrow strip, which had caught the disease from the Cape oats, there was not, however, a sign of rust in the other parts of the field, and the heads of even the rusted plants were as full and the seed as plump as in any other plant. It is worth noticing that the seed supplied to Mr. Griffin was a very poor sample, and consisted of sweepings

after the bulk of the seed had been distributed. The conclusion drawn from this trial is that the Mapstone oat gives every promise of possessing valuable powers of rust resistancy. — CLAUDE FULLER.

J. A. F. ORTLEPP, MELMOTH.

In accordance with the notice in *Agricultural Journal* No. 17, calling upon persons, etc., supplied with Mapstone oats to report, I am sorry I cannot just yet comply, in that the oats have not yet been reaped, but trust to do so fully by the end of this month.

Of the 25 lbs. received, I may state I distributed to four other farmers about 4 lbs. each, who so far speak very highly of the oat; the balance, about 9 lbs., I sowed myself on land well manured (last year) just after a crop of potatoes, on the 9th of April, and now after seven months is just ripe, fit to cut for seed; rust began to show towards the end of September, and is now very rusty, yet not useless. To me it does not appear to be the same kind of rust that has been destroying the Cape oat so completely of late years, and therefore send you a sample of the rusted oat for your further inspection. My farm being what is called "high veld," over 3,000 ft., and very much subject to misty weather, I am of opinion the oat should be sown about the end of February or first week in March, and would, I believe, ripen sooner, and before the wet season commences.

NOTE BY THE ENTOMOLOGIST.

I have examined the sample of oat sent in by Mr. Ortlepp, and find that it is affected with the *Puccinia* form of the rust. This is not the destructive stage (red rust), but is that which is, in my opinion, assumed when the parasite meets with uncongenial surroundings, and is such as I noticed to an infinitesimal extent when making my first observations upon the oat at Mapstone Bros'. farm.

The infestation is, however, in this case greater than I have seen it, but the sample of oat sent by Mr. Ortlepp is rather fine, and stands 5 ft. in height, and the attack appears to have come subsequent to the cutting stage, and not to have prevented the ripening of the seed. This has been the case with some other trials, and if such experience holds good throughout, the oat will have justified all its claims to rust resistancy and fill a gap in the Maritzburg District if nowhere else.—CLAUDE FULLER.

W. OLDFIELD, FOX HILL.

Mr. Oldfield reports to the effect that the seed was planted about the beginning of last February in land from which a crop of potatoes had just been taken. This had been manured with kraal manure and basic slag. Towards the end of April it was so dry that it looked as if the oats would not be worth anything, but having been irrigated a little they began to stool out and fill up the ground so that each plant became a proper bush.

The crop was cut towards the end of of September and at the beginning of October, as, owing to the irregularity with which they came on, they had to be cut at different times.

Mr. Oldfield considers the crop a success, as some of the oats stood four feet in height.

NOTE BY THE ENTOMOLOGIST.

The sample of seed supplied to Mr. Oldfield was a very poor one, and from my own observations very little of it germinated. As a consequence the oats were very wide apart when they came up. They stooled out wonderfully, and I have never seen any other examples to compare with them, some stools being quite 56 inches in circumference.—CLAUDE FULLER.

THOMAS FLEMING, BOSTON.

I received 12 lbs. of these oats from Government (through the Boston Farmers' Association) which I sowed on 19th January last, on a strip of land five yards from Winter oats. The land was not cultivated the previous year. Kraal manure was used as well as a liberal supply of bone dust. The oats were, I consider, sown too late for this District. At an early stage the Winter oats became blighted. The Mapstone oats promised well, but when seeding were attacked by the blight, and were useless for seed. I cut the field. The Winter oats were fed off. Both oats came on again in the spring; the Winter

has again been attacked, but so far I have not noticed any rust on the Mapstone, which is now in seed. After all, I hope to secure some seed. I purposely had the two kinds of oats almost side by side, and consider the test a very fair one. From my experience, I would say Mapstone oats are rust resisting—not rust proof, and the chances are in favour of getting a crop if sown at the right time.

Alexandra Agricultural Society.

AT the annual meeting of the Alexandra Agricultural Society, held at Umzinto on November 16th, the President (Mr. John Kirkman, J.P.), presented the following report, which is taken from the *Mercury*, and somewhat abbreviated :—

During the year we have had visits from two experts : Mr. Rouillard, an agricultural chemist, who gave us a most valuable lecture, which appeared in the *Mercury* ; and Mr. Fuller, Government Entomologist, who also came, at my invitation, to lecture on insect pests and fruit culture. The weather was not favourable to the carrying out of that gentleman's intention, but I may say that a promise was given that he would come here again. His report to the Government has just been sent me, and nothing, in my opinion, has appeared in the way of Government reports which is of more value. I strongly advise every member to apply for copies, for it is full of interesting information, and it is a pleasure to congratulate Government on such a result.

Our only function, the Show, was a pleasant success. The entries in produce, horses, and cattle were not as numerous as in former years, but other entries were in considerable excess, making a total of 670. Manufactures and sugar were good, and, as regards the latter, it was pleasant to find so many of our Victoria friends competing. In the poultry exhibit we were all most agreeably surprised, for the advance all through the section was most marked. The benefit of the show-cages, kindly lent us by the Durban Club, was so great that you will not hesitate, I am sure, to purchase similar cages for our own use in future. Tea and coffee exhibits were both good, and you will be glad to hear, as regards tea, that new gardens are now being started. Sir Benjamin Greenacre's kindness in sending a superb exhibition of ferns, for inspection, was much appreciated, and members will agree with me that it is good for all of us to look forward to the sweet by-and-by, when we shall retire from the hard toil of agriculture, and join Sir Benjamin and others in the pleasures derived from the culture of Nature's most beautiful gems. As regards our fruit exhibition, I must warn members of the danger of becoming conceited, and I suggest that we look upon the compliments so liberally paid us purely as a spur to make us strive for better and better. The presence of Mr. Polkinghorne, president of the Victoria County Association, was gratifying to all of us.

The labour question is extremely serious. For a long period now we have been unable to indent for Indians. The reason is one which can be removed, and we look forward to the prompt action of the new Board. Native labour is in a worse state still. There really exists no necessity for natives to work for money, unless for luxuries, and fines for fighting. Prior to rinderpest, the lobola had to be paid before marriage, and to raise money to buy cattle, and to pay off debts to friends for help in so doing, was the chief reason of natives turning out for work. Now they lobola on tick. If the Supreme Chief were to declare his determination to allow no marriage unless the native code were strictly carried out, and to plainly tell all the natives that the word "equivalent," in Section 178, Law 19, of '91, meant money at a fair rate of value for lobola : or money's worth in legalised long-dated and short-dated bills, recoverable at maturity, if needful, by Government, under Section 12, Act 40, of '96, without cost to the woman's kraal ; and with labour in the P.W.D. as a contingency : then all talk about poll-tax, native passes, or registration fees might drop. Old and

young amongst natives are asking for some such definite policy, and to leave things as they are is cruel and demoralising. I am indebted to a well-known Colonist here for the first suggestion of the above, which would be a willing cause to bring out 10,000 natives in a week—after they really understood the, to them, welcome news. At present, so far as poor statistics tell us, at least two-thirds of the available workers amongst natives are beer-drinking at their kraals.

The locust pest last season was very bad, and this year it appears worse still. The loss to the Colony is enormous, and hard work does not receive its due reward. Government were good enough to grant a sum of money, which was spent under the supervision of Mr. Archibald, M.L.A., during last season's hopper stage. The amount spent was £91. The reports kindly supplied me by the Minister for Agriculture are on the table for inspection. I earnestly suggest that this Association joins other Associations for one common end, viz., the destruction of hoppers at the cost of all people concerned. It is not fair that this burden should fall on the shoulders of the few, nor, in my opinion, is it quite needful to spend Government money for the relief of native tenants of absentee landowners. I quote Mr. Archibald's opinion from his report: "I would suggest that some stringent measures be taken to compel private landowners to clear their lands. This is done by planters and farmers, who cultivate, but absentees seem quite indifferent to what happens."—Report to Minister of Agriculture, 1901.

I regret that it is not possible to report to you any particular results from use of mineral manures. No doubt the trouble is the danger of their being put into solution by a heavy downpour of rain, before they are incorporated with the soil on our hillsides. This may be avoided by placing the manure deeper than most of us have hitherto thought wise. It is to be hoped that more interest will be taken in such matters. The use of mill manure is fully appreciated, and it is always successful.

The mealie crop last gathered was, in this county, with few exceptions, not an average crop. Examination of the rainfall registers, and the crops concerned, seem to point out hat the plant does not require—in fact does not thrive so well—with great heat coupled with much rain. In most cases the early planted crops were the best, except when punished by locusts. We earnestly hope that their planting late, to avoid that pest, will not always be necessary. A discussion on this and kindred matters would be good; for we can all learn something from each other. If there is a best time to plant, a best way to cultivate, to harvest, and to store, then surely it is worth trying to find.

Cattle have done splendidly during the past year. The county, except in one place, is free from disease, and young cattle seem to have pulled through the usual troubles without loss. I call members' attention to Mr. Fuller's exhaustive report on ticks. It seems certain that the insect cannot reproduce its species until after a feed on animal food; and we may take it that such is the reason why the scarcity of cattle has been followed by a great apparent reduction in the number of ticks. We are looking forward to the time when wealthy residents shall experiment in the production of the very best milking cow for the Coast, and we trust that the enormous acreage of land lately bought from Government shall soon be covered with choice stock, and that we shall be asked to attend the yearling sales. Rinderpest is reported on the march towards Natal. There is no need to be dismayed.

Prices have been good on the whole for the period referred to. Mealies came down in price when the military began to use oats instead; but the markets appear to be in a healthy state. Getting to the market is not so easy. The N.G.R. does its best; but we should like it to do better. However, gentlemen, it is bad agricultural form to grumble. I venture to suggest that farmers, and planters, and stockkeepers might wisely combine to have regular rated classes, both for stock and produce. There would be little difficulty in arranging to have bi-weekly slips sent out from Durban and Maritzburg, with the up-to-date prices attached to every class; and thus a good deal of business might be done direct, saving extra profits. The present price of cattle is very high, ranging from £25 to £14 for oxen, according to class; and from £50 to £15 for cows—all guaranteed and acclimatised cattle.

In conclusion, I have to thank my colleague, the Hon. Secretary, Mr. R. G. Archibald, for the keen interest he has taken in the year's work. To the Committee also do I tender my hearty recognition of enthusiastic support, and kind blindness to the President's shortcomings. The relations on all sides have been most cordial, and my year of presidency will always be to me a sort of pleasant memory. But you must pardon me for saying that surely our energy and organisation are capable of doing more for agriculture than is expressed by our one single yearly effort for a Show.

The Tunis Sheep in America.

THE stock-farmers of the United States, says "Bruni" in the "Australasian," have little, if any, prejudice in live-stock husbandry. If a variety of the domestic animals gives a promise of proving useful as farm stock, that variety – no matter what its origin—is given a fair trial, and if the result is a success, the variety is adopted as a beneficial farm stock. This has been the case with the Tunis sheep. In the year 1773 General Wm. Eaton, then United States Consul at Tunis, purchased from the Bey of Tunis ten sheep, from the Royal stud farm. These sheep were sent to America, but only one ram and one ewe survived the voyage. They were placed under the care of Judge Peters, of Belmont, near Philadelphia, who raised a good-sized flock from them. Several drafts were sent to Carolina, Georgia, and Virginia. During the war these sheep were nearly exterminated, but since then they have been bred up, and their value as mutton sheep has brought them into prominence. During the fine-wool craze they declined in favour, but they have since come into the first rank, particularly in the South, as mutton sheep. The following description is given of these sheep :—"They are hardy, fatten easily, of light bone, broad, and long backs, slender neck, and deer-shaped head. They breed at any time desired, and sometimes produce two crops of lambs a year." From a work, entitled "A Study of Breeds," by Professor Thomas Shaw, I learn that these sheep in size are nearly equal to the Dorset, but are not as heavy. The average weight of a matured ram in good form is put at 180 lb., and of a matured ewe 130 lb. Their early-maturing qualities are of the best, and their lambs can be rapidly pushed on for markets. They are active foragers, and consume a great variety of weeds. It is claimed that the carcase dresses profitably on the block, the meat is of the very best, the fat being blended with the lean, and not laid on externally, and the quality is excellent. The Tunis sheep have a peculiarity, which is thus described by Professor Shaw:—"At birth the tail has much loose skin extending from the base for a considerable distance downwards. Unless when cut close while the animal is young, the space thus furnished fills with a fatty substance, to the width of 3in. or 4in. It will then weigh from 3 lb. to 6 lb., according to the condition of the sheep. The Tunis breed must not, however, be confounded with various races of fat-tailed sheep found in the old world." Though I have met with several notices of this breed of sheep in American publications, the only mention of the wool that I have seen is by Professor Shaw, and he merely says of it that it is probably inferior in weight to that of the Southdown. Oddly enough, he says nothing of its quality. A portrait of a ram is given in a late number of the "American Agriculturist," which shows a very shapely sheep, on short legs, with a good head and very small horns, not larger than will be sometimes seen on merino wethers.

The motor-car is coming largely into use in England for the purpose of conveying strawberries and other delicate and quickly perishable fruits from the provinces into London and other large centres. By this means of transport the injurious handling necessitated by railway conveyance is removed. The baskets of strawberries, etc, are simply loaded on the motor-car at the gardens, and are delivered into the hands of the shopkeeper, thus saving half-a-dozen handlings. It is thought that the system will meet with a very wide adoption.

Gleanings.

Should bad farming be penalised? Expressed in that form, the subject is too broad to be considered, but bad farming by neglect of weeds to the detriment of a neighbour's farming may yet require to be dealt with as a correspondent says it is in the Isle of Man.

A sugar contractor who arrived recently at Cairns (Queensland) with white labour to feed the cane carriers has relinquished the contract. After a week's trial at 4d. per ton his men struck, saying that the work was not fit for white men, although there were 19 whites employed for the same work which 15 Hindoos were accomplishing. Ten of the white men were the sons of cane farmers at Bundaberg, and were used to handling cane.

Mr. George Vulder, principal of the Hawkesbury Agricultural College, writes in the "Agricultural Gazette" of New South Wales:—"Cabbages are well suited for feeding to all classes of farm stock, particularly dairy cows, being regarded as superior in value to turnips and rape. They do, however, sometimes slightly affect the flavour of the milk and butter, but this is generally due to feeding the animals to excess on cabbages. Provided they are fed in combination with other fodder there is little risk of this. The open-leaf cabbages are of better feeding value than the hearting ones, and it is generally considered are not liable to taint the milk. In Europe cabbages are largely grown for feeding to dairy cattle."

The largest transaction in timber on record has just been completed in California. A hundred thousand acres of heavy timber, consisting of sugar pine, yellow pine, fir, and spruce, have been sold to one buyer for the sum of 2,500,000 dol. The purchaser is one of the largest lumbermen in the United States, and has accumulated an immense fortune at the business; his five sons will carry on this extensive affair.

It is interesting to learn that a new species of coffee (Coffea robusta) has been introduced by the Belgian Societe Horticole Coloniale from the Congo, which, from observations made upon it in its native habitat, is believed from its great vigour to be able to resist the disease which has made such terrible inroads upon plantations all over the world. It is at the same time a very free-bearing species, and produces berries of excellent quality. C. robusta is handsome as a decorative plant, with its broad, shining leaves and abundant bloom. The scented flowers of pure white are succeeded by green berries, which become first yellow and finally turn red, so that the plant is ornamental at all stages. Should it prove on further trial to be absolutely disease-proof it will (says the "Garden") be gratefully welcomed as an international boon.

It is suggested that the Dairy Show authorities should request the exhibitors of roots to state the quantity as well as the kind of manure used.

At Hiam-kill-marsh-priest, in Kent, the farmers had a peculiar method of washing their sheep in the eighteenth century. There are in that district numerous creeks which are muddy when the tide is out, but which at full tide are deep in water. The farmer tied ropes to three or four of his flock and hauled them across, when the rest followed quite willingly. This operation was repeated till every sheep had crossed seven or eight times, which was as often as the flock could find time to cross at one tide. Farmers claimed that this mode of washing was preferable to scouring and rubbing.

Throwing cream out by centrifugal motion is old. Now they jerk chicken feathers off by wind. It is done this way. The fowl's head is chopped off, the body is put in a place provided for that purpose, then two tornadoes are turned loose on the bird. They are called "cross currents of air from electrical fans." The chicken jiggles an instant and the feathers are gone. The fans are pretty lively things themselves, turning at the rate of 5,000 revolutions per minute.

A silver-mounted horse-hoof in the form of an ink-well was shown in the Industrial Hall of the Glasgow Exhibition. This relic of the Crimean War was found in a Boer wagon by Private A. Hester, of Govan, now in South Africa on service in the King's Own Scottish Borderers. The hoof is well preserved, and the inscription is as follows:—"The hoof of Donnybrook, the charger of Major-General Johnstone, C.B., late 33rd Duke of Wellington's Regiment, during great part of the Crimean campaign." The lid of the ink-well is the Crimean medal of the major-general. How this relic got into Boer hands is a mystery.

Mr. Edward Lisle, whose "Observations on Husbandry" was published in 1757, describes the method employed by his "oxhind" or cattleman to break cattle to the yoke:—"He yoked two of the steers, being two yearlings, together, and so suffered them to walk about the ground where there were no pits nor ditches for them to receive hurt by. He also tied together the bushy parts of their tails: the reason of which was because they should not be able to turn their heads to each other, so as to strike one another with their horns, or, by bending their necks too much, by endeavouring to face one another, and then striving, break their necks." In this condition the oxhind let them go on the ground, if without holes or ditches, all night, or else turned them into an empty open barn so yoked, and thus treated them two or three times before he worked them.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	F. R. Moor ...	Greystone.
		,,	F. Bloy	Monte Cristo.
		,,	F. Knapp ...	Klipfontein.
		,,	J. W. Moor ...	Moorleigh.
		,,	J. Oates ...	Oatsvale.
		,,	R. C. O'Neil ...	Hillgrove.
		,,	C. J. Labuscagne...	Haatsfontein.
		,,	B. J. Wilkes ...	Portington.
		,,	A. G. Harding ...	Marshlands.
		,,	Du Plessis & Cloete	Compensation.
		,,	J. Van der Merwe	Welgekoose
		,,	A. Pretorius ..	Shypoort
		,,	C. W. Dennill. ...	Guadaloupe.
J. Button	Estcourt, South of Bushman's River	,,	S. Nel ...	Wagon Drift.
		,,	C. B. Lloyd ...	Hidcote.
		,,	Geo. Gibson ...	Craignevin.
		,,	L. Schomann ...	Twyfelfontein.
		,,	S. Schomann ...	Willow Grange.
		,,	W. McFie ...	Highlands.
		,,	J. K. H. Miller ...	Beacon Hill.
		,,	H. E. Kirby ...	Klipfontein.
		,,	J. Marais ...	Malan Spruit
		,,	A. Lawrence ..	Grant'eigh.
		,,	L. Berthon ...	Littlecote.
		,,	J. Chadwick ...	Howard.
		,,	C. J. Smythe ...	Stratherne.
A. H. Ball	Weenen ...	,,	W. Lotter ...	Doornkloof.
		,,	P. Van Rooyen ...	Middleburg.
		,,	C. P. F. Van Rooyen	Mona.
		,,	P. M. Lotter ...	Waterfall.
		,,	S. C. Van Rooyen	Middleberg.
		Lungsickness	Maboko	Bushman's River Poort.
J. J. Hodson ...	Lion's River ...	Scab	W. T. Shaw ...	Shawswood.
		,,	J. J. Morton ...	Sherwood.
		,,	F. Curry ...	Weltevreden.
		,,	Mrs. F. McKenzie	Onverwacht.
		,,	W. L. Methley ...	Newstead.
		,,	Jos. Raw	Buffels Bosch.
E. J. B. Hosking ...	Upper Umkomanzi	,,	Mr. Gibson ...	Howard's Hill.
		,,	Wm. Watson ...	Minerva.
R. J. Raw .	Impendhle ...	,,	T. Fleming ...	Good Hope.
		,,	J. W. Brooke ...	Impendhle Store.
		,,	G. Renyard ...	Hamilton Hall.
		,,	A. C. Crosse ...	Dingley Dell.
		,,	R. Gresham ...	Castle Howard.
		,,	C. P. Speirs ...	Mount Park.
		,,	R. Ogram ...	Tilletudleni.
		,,	A. H. Lee ...	Inhluzani.
		,,	F. Knapp ...	Furth.
		,,	S. M. Shaw ...	Umgeni Poort.
		,,	C. W. Roberts ...	Ebrington.
		Lungsickness	C. C. Lewis, and Native ...	Clairmont.
W. Wilson	Polela	Scab	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
		,,	R. C. Gold ...	Woodend.
		,,	R. M. Arbuckle ...	Costmore.
		,,	J. J. Van Dyke ...	Riverport.
		,,	J. Van der Merwe	Nooitgedacht.

Stock Inspector.	District.	Disease.	Owner.	Farm.
W. Wilson	Polela	Scab	S. Maritz ...	Maritzdale.
		,,	F. E. Peto ...	Clovelly.
		,,	H. Nicholson ...	Fondling.
		,,	H. C. Gold ...	Dartford & Greenend.
		,,	J. Van Wykes ...	Epsom.
C. E. Hancock ...	Ixopo ...	,,	W. Gray ...	Helmsley.
		,,	J. Dalgarno ...	Abercairney.
		,,	A. Stone	Craigie Lee.
		,,	G. Thompson ...	Cromwell.
		,,	J. Anderson ..	Littledale.
		,,	Est. R. Raw ...	Eastwolds.
		,,	Lulakana ...	Mackenzie's Farm.
		,,	J. W. Marwick ...	Flettsberg.
		,,	W. K. Anderson ...	Maxwell.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	Pietermaritzburg Corporation ...	Sanitary Depôt.
		,,	F. Knapp & Nonshlene ..	Polly Shorts.
		,,	J. Townsend ...	146, West Street, Pietermaritzburg.
		,,	T. Owen ...	9, Pietermaritz St.
		,,	P. H. McCrystal...	11, ,,
		,,	F. Knapp	,,
J. A. Morrison ...	Durban & Umlazi	,,	Muti ...	Infuni M.S.
		,,	P. Saville ...	Umzimbazi.
		,,	W. Pearce ...	Lower Illovo.
W. A. Hutchinson	Alfred ...	Scab	Nqubu ...	Location.
		,,	Makubana ...	Amaci Location.
		,,	J. Wessels ...	Sheepwalk.
		,,	Geletu Flentyi ...	Location
		,,	Inkubi and Duli ...	
		,,	C. J. Triegaart ...	The May.
		Lungsickness	T. Groom, H. Clark, W. Simpson, P.W. Dept.	Ingeli Poort.
			G. Blakeway	
			F. Mainwearing	
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	,,	F. E. Zunckel ...	Rivulet.
		,,	J. Lawford ...	Emmadale.
		,,	Natives	Hongerspoort.
		Scab	A. J. Harding ...	Zwart Kop.
		,,	J. Dryer ...	Culfergie.
		,,	J. M. Wales ...	Farleigh.
		,,	D. Evans	Zuur Laager
E. Varty ...	Umvoti, Western Portion	,,	J. M Van Rooyen	Pompoennek.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	— Thompson ...	Marburg.
		,,	W. Clothier ...	Ultima Thule.
		,,	C. Mahai	Marburg.
		,,	C. Kaupar ...	,,
		,,	J. Malichi ...	,,
		,,	H. Mason	Oakhurst.

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

Rinderpest at present exists amongst natives' cattle on farms Doornhoek, Kirkintulloch, and Dipping Station, Van Reenen's Pass, and amongst cattle of Pepworth & Reid, on farm Rietfontein, in the Ladysmith Division, and on farms Schoonspruit and Zandspruit, in the Upper Tugela Division north of the Tugela River.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 4th December, 1901.

The F. Stevens & Co. Fruit Canning Syndicate.

By Frederick Stevens.

THE canning business of F. Stevens, Scottsfontein, Highlands Station, had its origin in the experimental canning of fruit from Mr. Stevens' own orchards in '96 and '97, chiefly for home consumption. Some of it found its way amongst neighbours, and seemed to be so much appreciated that Mr. Stevens decided the following year to put up a larger quantity and offer some for sale.

The quantity offered for sale in '98-'99 was 5,500 3-lb. tins, the whole of which was sold out within four months. The cooking apparatus used was made locally from Mr. Stevens' own design; the tins were made in Durban and the labels printed there. The box sections were imported from America.

The following season a much larger output was intended, and preparations made accordingly. Additional boilers were ordered locally, and machinery for making the tins ordered from England. It was decided to make Estcourt the manufacturing centre, and suitable premises were leased there.

At the time of the Boer invasion everything was in a forward state for commencing operations. The tin plates, box sections, and other raw material were already stored in the premises, and the machinery was on rail at the station waiting to be off-loaded. Whatever chance there might have been of successfully carrying on operations at Estcourt that season—and as events proved subsequently the Boer invasion would not have prevented it—the military authorities nipped it in the bud by commandeering the premises for the use of the officers' mess of the Dublin Fusiliers. As soon as the Boers retired to the Tugela the machinery and material were removed to Mr. Stevens' farm Scottsfontein, 13 miles from Highlands, and an attempt was made to snatch what remained of the fruit season.

The output for '99-1900 was 21,000 lbs. of canned fruit, which was disposed of in four months.

The following season, 1900-'01, was a record bad one for fruit, and the output was 13,000 3-lb. tins, whereas preparations had been made to fill 30,000 tins. This does not mean that there was not sufficient fruit available, but that the crops bespoken fell short of the estimate, although a handsome margin had been allowed.

Mr. Stevens has now associated with him a few of the leading Durban and Maritzburg business men, who have guaranteed sufficient working capital to enlarge the industry to the full extent of its capabilities, and the business is now being carried on under the style of F. Stevens & Company.

Mr. Stevens has a fairly extensive orchard, planted mainly with varieties of fruit suitable for canning. Next year there will be nearly 2,000 trees in bearing, and a further 4,000 in four years' time. These orchards will serve as a backbone to the industry, but in view of the large annual output anticipated, much of the fruit manufactured will have to be purchased.

Tomato canning, which has been successfully tried at Scottsfontein, will be a prominent feature of the industry, and sweet corn and vegetables will shortly be included.

During the present season arrangements have been made with a Noodsberg wattle grower for a supply of box sections, and nothing now will be imported for the business beyond the tin plates, solder, and nails.

In the putting up of the canned goods nothing but the best grade of fruit, etc., is used, and every precaution is taken to ensure its arriving at the factory in as perfect a condition as possible. The cooking is done by what is know as the open-bath process. With fruit canning, as in jam making, each manufacturer has some wrinkles of his own which are not given away, and there are several processes and variations of processes. However Mr. Stevens' process may differ from others, it ensures a maximum of cleanliness in every detail, and the full preservation of the flavour of the fruit.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 2nd January next :—

Thornybush.—Bay mare pony, branded LM on off hind quarter, sore on front leg from being knee-haltered.

Lower Umfolozi.—Black cow, black-and-white spotted belly, branded on left hip JL, with black heifer calf.

Estcourt.—On H. Carter's farm "Tintern," grey colt, 3 years old, branded on the off-side hind leg HE, and piece out of back of right ear.

Amended Pound Notice.—In *Gazette* of October 29th, 1901, Government Notice 614 :—Reported by J. Thorrold as running on the farm "The Moorings," Sunday's River, grey mare, 14 to 15 hands high, looks aged, in poor condition, broad leather strap round neck, branded CV on off-leg. Small grey mare, fair condition, may be foal of the above mare. Small brown mare, between two and three years old, in fair condition. This mare's tail has been cut, but has long hairs hanging down over the cut part. These animals have now been driven to Ladysmith Pound, and will be sold on the 4th of December if not released.

The stock impounded as hereunder will be sold, unless previously released, on the 15th January next :—

Howick.—Dark-bay gelding, black points, been shod all round, dark mark and white spot under saddle, notch in right ear.

N'Konjeni, Mahlabatini, Zululand.—Red ox, 5 years old, branded V left flank. Two black-and-white oxen, 3 years old, branded DF right side.

Thorny Bush.—Black horse, branded NC and 50 on front hoofs, branded HB. Bay mare, untamed.

Isipingo.—Bay pony, mare, 13·1 hands, 4 years old, branded ND on near hind quarter.

Howick.—On Mr. Henderson's farm, Hilton.—One stray sheep, branded H near side.

Nqutu.—Blue-and-white bull, no brands or marks, value about £6. Impounded by Native John, and will be sold one month from date (25th November) if not previously released.

N'Konjeni Mahlabatini, Zululand, on the 13th November, 1901.—Black bull, 3 years old, no brands. Black-and-white bull, 5 years old, branded DU right side. Impounded by the Magistrate, Mahlabatini, and will be sold one month from date unless previously released.

Correspondence.

To the Editor Agricultural Journal.

DISEASED VINE.

SIR,—Thanks for information about diseased vine ; I note the remedy for the disease.

(*a*) As I understand the treatment, it must be delayed until next winter ; am I right ?

(*b*) I now pick off all leaves and fruit as they appear to come under the influence of the fungus and carefully burn them.

(*c*) Can one reduce the quantities given to, say, five gallons water and four fluid ounces of sulphuric acid ? These quantities would give me an ample supply, as I have only a few young vines which, excepting the diseased one, have not yet commenced fruiting ; moreover, I have no utensils in which to boil 20 gallons water, neither have I a wooden receptacle to hold the stuff when made.

Yours, etc.,

JAMES THORROLD.

The "Moorings," Sunday's River,

The following replies to Mr. Thorrold's enquiries are supplied by the Government Entomologist:—

(*a*) The treatment of the vines with sulphate of iron and sulphuric acid solution must be delayed until next winter, but the vines may now be treated with Bordeaux Mixture, prepared according to instructions given upon p. 29 of my report, a copy of which has been posted to Mr. Thorrold. Should the preparation of this mixture prove too irksome, I would recommend fortnightly sprayings with "Strawsonite." Packets, price 6d., may be purchased from P. Henwood, Soutter & Co., Durban and Pietermaritzburg, one packet being sufficient for 2-3 gallons of water.

(*b*) This practice will do no harm.

(*c*) Yes, certainly. Any formula given for the destruction of insect and fungus pests can be proportionately increased or decreased.

Forestry.

WILL FOREST CULTURE PAY IN QUEENSLAND?

IN our notes on Forest Conservancy we mentioned (says the "Queensland Agricultural Journal") the case of a natural growth of young blue gums (*Eucalyptus tereticornis*) springing from seed which had been scattered over the ground by the felling of several large trees in seed. The young saplings grew up straight as arrows, and the grove only required thinning out at proper times to have established a splendid stand of timber for the future.

As this occurred in the year 1864, it will be understood that had these trees been allowed to grow to the present day they would have been nearly thirty-seven years old, and by judicious cutting and replanting we should have now possessed a crop from which a good annual income would have resulted. A correspondent, Mr. J. T. Pentzcke, of the Daintree, writes of a similar experience. He commences by putting the question—"Will forest culture pay the farmer?" This would depend greatly on the system of forestry adopted, and also to a large extent on the concessions in the way of long leases made by the State Government to men who would honestly undertake to take the matter up and carry it out in such a manner as to make the work a revenue-producing one for future generations.

Before the scrub lands on the Daintree were open for selection, the pioneer cedar-getters had already sent many shiploads of valuable cedar to the South. The only site for a sawmill was a low-lying, ti-tree, and mangrove swamp. The hardy pioneers had only a small piece of camping ground, where they suffered much from fever and ague. Mr. Pentzcke took up some land in the scrub adjoining Mr. Freshney's selection, and cleared about 4 acres, leaving two cedar trees standing in the clearing, and carefully protecting them from fire when burning off. When the crops of maize, bananas, sweet potatoes, &c, were well grown in October and November, the winged seed of those cedars began to scatter broadcast over the land, and lay thickly about on the pumpkin leaves. These germinated under the shelter of the crops, and, after the wet season was over, he destroyed more than a thousand young cedar plants in clearing up the ground, besides a quantity of undergrowth, which is needed by the young trees to enable them to grow tall and slender whilst making their "height growth," a most important period for the silviculturist. The plants, being thus sheltered, do not become bushy, but draw up till they top the scrub and then commence to make lateral growth and spreading tops. Had he left the cedar and undergrowth alone, these would to-day have been a nice patch of tall valuable timber which in fifteen years' time from now would have been fit to harvest, as he has observed that the cedar on the Daintree increases by 3 inches in girth per annum. There are, besides cedar, many other valuable timbers in the scrubs, and others might be planted. Some of the native timbers there are of exquisite beauty and of great commercial value,

but as yet they are only known to botanists. They require to be sent to a market where their value would be thoroughly understood. When this so devoutly to be wished consummation is attained, the foresters would go systematically to work, taking the forest on the face and felling all mature trees, get rid of weakly, useless trees, save all plants of useful kinds, and plant bare spaces with better varieties. Thus, at the outset, a rich harvest would be gathered without planting; but felling without replanting is contrary to the rules of good forestry. "Therefore," says Mr. Pentzcke, "we *must* replant in order to leave a harvest for those who come after us, for *we* shall not reap the benefit of what we have planted." In writing of the Diseases in Plant Act, he complains that the planter is much hampered and handicapped by its operation, and maintains that the greatest pest is neglect. During the early period of cedar-getting Mr. Pentzcke's next-door neighbour had a selection comprising 160 acres. On this area he and his neighbour felled cedar-trees, which yielded 300,000 superficial feet of sound timber, whilst a great quantity was left as waste. Not a single tree was felled under eight feet in girth, because as all timber-getters know, cedar of less girth is not worth anything; in fact, to fell smaller trees is nothing short of criminal. As soon as the regular cedar-getters had taken off the large timber, the land was selected for farming. Then the selector cut down all the remaining timber, even that only two feet in diameter, and pit-sawed it. Now, had he allowed that young timber to mature, it would by this time have increased 200 per cent. in size and value. There is still a great quantity of young cedar and over eighty fine bean trees on this land, besides numbers of other excellent timbers. One acre is planted in coffee, staked with bean-tree stakes. Had the timber producing these stakes been cut in "flitches," and sold to veneer-cutters, it would have brought £6.

We are greatly obliged to Mr. Pentzcke for his interesting letter. If more Northern men were like minded, it would not be long before private forest culture would form a valuable Northern industry. Some people scout the idea of tree-planting, on the ground that they would be in their graves before any profit could be reaped from a plantation. Such people forget that all good parents try and make some provision for their children. A couple of hundred acres of cedar and pine well managed would form a legacy which would render their children independent in the prime of life.

This reminds us of a German story about tree-planting. Some travellers saw an old man of seventy planting an orchard of young cherry-trees, and they asked him why he was so foolish as to plant trees, the fruit of which he could not hope to live to enjoy. "I shall probably not live to enjoy the fruit, certainly, but those who come after me will enjoy it and bless the memory of the planter," was the old man's reply.

Cutworms.

THE vast amount of damage done to the onion crops in New York State by cutworms has led to a series of experiments to demonstrate the most effective method of destroying the stealthy marauders. The results are issued in a special bulletin, and it appears that they tried spraying the onion with a mixture of pulverised resin 5 lb., fish oil or any animal oil 1 pint, concentrated lye 1 lb., mixed with 5 gallons of water, and then 1 gallon of this used in 160 gallons of water. They also tried spraying at night with kerosene emulsion, but both these methods proved unsatisfactory in many respects. A bait made of bunches of freshly-cut grass dipped in a solution of one part Paris green to eighty parts of water, and another made of 1 lb. of Paris green to 50 lb. of bran, moistened, did not prove of as much value as a mixture of bran, or equal parts of bran and middlings mixed as above with the Paris green, and applied dry. This can be sown in drills along the outside of the field to trap and kill worms if they come from other fields; it can be easily and uniformly applied with the onion-seed drill; it can be sown in drills alongside the rows of onions, and the labour required is much less than that of mixing with water and ladling it out in piles. For other garden crops, such as tomatoes, egg-plants, sweet-potatoes, cabbages, etc., it is advised to use a table-

spoonful of bait about the base of each plant after it is transplanted, and when possible it should be scattered over the field a few days before the plants are transplanted. Much of the damage usually attributed to bandicoots and hares is due to cutworms. In fields that are really badly infested it is said that a change to a millet crop for a season will be of great benefit.

To keep White Ants from a Building.

ALL house-owners (says the "Queensland Agricultural Journal") both in town and country know by experience the destruction caused by Termites when once they have affected a lodgment in a building either of stone, brick or wood. It is expensive work getting rid of them and replacing the damaged timbers; therefore, the best plan is to build in such a way that the pests have no chance of gaining an entrance. Hence, in a wooden building the stumps on which the lower framework rests demand the most careful attention. In the first place, no stump should be used which is the least gone or "dozy" at the heart. Neither should any that have radiating cracks from the centre to the circumference be employed. In the next place, every stump should be thoroughly sapped well into the old wood, and stumps should also never exceed 12 inches in diameter of solid wood, neither should they stand out of the ground at any less height than 2 feet or 2 feet 3 inches. Suitable stumps of this kind having been prepared, the next operation is to tar them. Some char them before tarring, but this is worse than useless. The heat causes the timber to crack longitudinally by the expansion of the moisture by heat, and a dozen channels are thus opened for the entrance of the enemy. Stumps should not be dressed with cold coal tar. It should be thoroughly boiled until every particle of moisture and volatile oils contained in it are driven off. It should then be allowed to cool, and next day it will be almost solid. When all is ready, warm the tar till it becomes fluid enough to apply. Give the stumps two heavy coats of this, not forgetting the end which is to be set in the ground. Now pour some crude cold tar into the stump hole and set the stump on this. See that it stands in the same position as it occupied in the growing tree, the small end end uppermost. Then slightly damp the soil to be returned with crude tar, and ram it in firmly. The lower end is now quite secure. The upper end should be covered with a 24-gauge galvanised iron cap.

On no account allow a spike to be driven through the cap to hold the ground plates. There is not any need for a spike, as the weight of the building will hold everything firmly in its place.

The building will not shift; and if a hurricane comes along, the spike would not hold any more that a wooden peg. Thus both top and bottom of the stump are so far absolutely safe from the white ants.

But all this will be useless unless great care is taken with the building of the chimney. This should have a concrete foundation, and be capped with iron projecting about three inches all round, set lower than the stump caps. Thus the ants can find no means of communication with the building by means of the chimney.

Finally, verandah steps should be carefully isolated by setting the sides of the steps on short stumps well clear of the ground, capped and tarred as before directed. The house is now practically safe. But there is still a source of danger, and one that is commonly disregarded. People find the under part of the house a convenient storeroom for old timber, cases and barrels. This lumber is often pushed under the house, touching the joists. The ants are not long in finding this out, and once they do so all the previous precautions will be of no avail. There is a case on record where the Termites entered a building by constructing a tunnel up a piece of stiff grass which grew up just inside a stump, and touched the flooring of the house. Therefore, all weeds, *Sida retusa*, &c., should be carefully cleared away, and no lumber be allowed to connect the joists with the ground. By attention to these points there will be no danger of a house being invaded by this one of the greatest pests of hot climates.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—An abundance of garden produce is disposed of on the Market almost every day at prices which evidently do not meet with the approbation of the growers: but as the season, up to the present, has been so favourable, it was only natural to expect a record—so far as vegetables are concerned. More forage has been sold on the market during the past few weeks than there has been for many months; and now that the farmers have obtained a variety which is in a measure insusceptible to rust, it may be expected that scarcity in this article is a thing of the past. Trade is far from brisk, and one hears the same complaint daily about business being quiet.

Mealies.—The average price is about 11s. 6d. to 12s. per muid.

Forage.—As stated above, there is a better supply than we have experienced for a long time, and prices have been as low as 1s., 1s. 3d., 1s. 6d., and 1s. 10d. per 100 lbs.; superior samples realising from 8s. to 10s. 8d. per 100 lbs.

Hay.—From 1s. 9d. to 2s. 3d. per 100 lbs.; bedding, from 17s. 6d. to 19s. 6d. per load.

Potatoes.—New potatoes are offered almost every day at prices varying between 12s. and 17s. 9d. per 100 lbs. There has also been a large quantity disposed of at figures ranging between 3s. and 6s. 6d per 100 lbs.; these, however, are only fit for seed. Sweet potatoes from 1s. 6d. to 5s. per sack.

Beans.—Sold from 11s. 3d. to 14s. 9d. per 100 lbs.

Pumpkins.—From 5s. to 8s. 9d. per doz.

Mabele.—Most of the samples are poor and have only realised from 4s. 6d., 5s., and 5s. 2d. per 100 lbs.; sound and good samples have, however, reached 8s. to 10s. 3d. per 100 lbs.

Peas. From 4s. to 10s. and 12s. 6d. per 100 lbs.

Onions.—The market has been well supplied during the past fortnight, and prices have been almost everything between 9s. and 25s. per 100 lbs.

Butter.—Plenty offering every day at prices varying between 9d. and 1s. 9d. per lb.

Eggs.—Some mornings eggs have been as low as 11d., 1s. and 1s. 3d per doz., however, some samples have commanded 2s., 2s. 5d., and 2s. 7d. per dozen.

Poultry.—Now that we are nearing the festive season, prices are advancing; and while chickens have been disposed of at 1s. 7d, 1s. 10d., 2s., and 2s. 3d. each, fowls (fit for table) have realised 3s. 6d., 4s. 4d., and 5s. 9d. each. Ducks, 8s. to 10s. 6d. per pair. Turkeys (cocks), from 26s. 6d. to 32s. 6d. each; hens, about 15s. each.

Sundries.—Beef, 3d. to 7½d. per lb.; mutton, 3½d. to 9½d. per lb.; pork, 3d. to 8d. per lb.; ham, 10d. to 1s. 0½d. per lb.; bacon, 4½d. to 10½d. per lb.; pigeons, 1s. 9d. per pair; rabbits, 1s. 1d. each; and fish, according to size.

Vegetables.—Beans, beetroot, celery, cabbage, carrots, lettuce, onions, peas, potatoes, rhubarb, tomatoes, turnips, etc., sold every day.

Fruit.—Bananas, lemons, oranges, naartjes, peaches, pineapples, and a large quantity of plums, have been disposed of daily.

Wood. From 5d. to 1s. 5d. per 100 lbs.

DURBAN.—Our correspondent (Mr. W. H. Edmonds) is, we regret to say, unable, through indisposition, to furnish us with his fortnightly report.

WOOL.

Mr. James Egner reports:—The wool sales on Monday opened fairly strong, notwithstanding the unfavourable cable from London reporting a ¼d. drop on Merinos and ½d. on crossbreds. The top price, 7d., was reached by two exceptionally clean and good-yielding wools; the average unskirted wools brought from 5¾d. to 6¼d. These prices were in the face of higher shipping rates. It is, however, my firm opinion that these prices will not be maintained: in fact there are indications in that direction, purchases not finally closed yesterday were refused to-day. It is a mistake, as a rule, of farmers not to trust to their brokers and to public competition. When the next Bucknall liner is available, another farthing increase—all things being equal—as I explained in a recent report, may be looked forward to by sellers.

STOCK SALES.

Messrs. J. Raw & Co., auctioneers, held a sale at Nottingham Road on 20th November, under the auspices of the Nottingham Road Farmers' Association, when the following prices were realised:—Sheep, 25s., 28s.; pigs, 29s., oxen, £21, £21 15s., £19 10s., £17, £18 10s., £18; cows, £15, £13, £25, £14; cows and calves, £16 10s., £15, £17, £21, £13, £19 5s.; heifers, £9 5s.; horses, 15 gns.; yearlings, £8 15s.; fowls, 6s.

At Mooi River, on the 21st November, where about 200 horses were sold, the following prices were realised:—¼ gn, 1 gn., 1½ gns.; 2 gns, 2½ gns., 2¾ gns., 3 gns., 3½ gns., 4 gns., 4¼ gns., 4¾ gns., 5 gns., 5¼ gns., 6½ gns., 7 gns., 7¾ gns., 8¼ gns., 9 gns., 11 gns., 11¾ gns., 17 gns.

Since the 21st ult. we have not held any country sales of stock, and at present have only the market sales of the 23rd and 30th November to report upon. The prices realized on these dates were as follows:—Cows, £12·10s.; £11; £16, 7s. 6d., £7 5s. each; cows with calves, £13, £14. £20 each; heifers, £12, £16 each; itole, £10 10s each; oxen, £18 and £19 5s. per head; horses, 10 gns.

A small lot of cast military horses were sold at:—1½ gns., 3 gns., 6 gns., 7 gns., 8½ gns., 9 gns., 9½ gns., 10½ gns., 11 gns., 12 gns., 16 gns., 18 gns., 20 gns. each.

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AND MINING RECORD.

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CONTENTS.

Rinderpest.

(Continued.)

BY H. WATKINS-PITCHFORD, F.R.C.V.S., DIRECTOR VETERINARY DEPARTMENT.

BILE INOCULATION.

A RECOGNITION of so grave a fact that bile taken directly from a beast which had succumbed from the rinderpest when introduced into the system of of a healthy animal was, under certain certain circumstances, capable of giving rise to the disease, called for the devising of a means by which this objection to the use of bile as a protective agent could be overcome. Koch had shown in his earlier researches into the disease that the admixture of glycerine with virulent blood was sufficient to cause the destruction in the blood of the contained infectious principle. It would, therefore, have seemed a natural inference that the same agent would exert a similar bactericidal effect when added to other infectious body fluids. That this in fact was the case was ascertained by Dr. Edington, who, by adding a large percentage (33 per cent.) of glycerine to the gall taken from a rinderpest beast, was able to show that by such contact the infective power of bile was

as effectually destroyed as was the contagium of blood. A further practical advantage was noted, inasmuch as — in accordance with the well ascertained antiseptic powers of glycerine—this mixture was capable of resisting the inroad of putrefactive organisms, and so preserving the bile for an indefinite time.

This was a distinct advance in the bile method, and such a simple process would doubtless have been genenerally adopted had it not been asserted by other workers that the addition of glycerine seriously impaired the immunising powers of the bile.

That this seems to be the case to some extent is undoubted, although how great the loss of immunising power is must be a matter still for future determination. The question as to how such deterioration could occur involves a consideration of the composition of rinderpest bile, which would necessarily be off too technical a nature for general interest. Briefly, it may be conjectured that if the immunising principles of the bile are dependent in any degree upon the actual presence of the rinderpest organism in a living state, that the destruction of the vitality of this germ consequent upon the addition of a large percentage of glycerine would deprive the bile of any properties due to the presence, either in an active or inhibited state, of this specific organism.

Whether rinderpest bile owes any of its immunising power to the actual presence of this specific organism is problematical. Should it exist, it is probably present in such an inhibited or attenuated state that it is incapable of vigorous growth, and might in this form conceivably exert a gradual immunising effect, somewhat in the same manner that the attenuated microbe of quarter-evil produces its immunity.

However that may be, no one who has studied the effect of bile injections in sick animals will deny the existence of a strong anti-toxic or curative principle contained in it. That these passive immunising substances are destroyed to any degree by the addition of glycerine is improbable, and we have no reason to believe that this undoubted immunising principle is less stable than, or differs greatly from, that contained in the blood and other body fluids of an animal having suffered from the disease. From our late experience we know that rinderpest serum maintains its potency for three or four years without a degree of deterioration appreciable to our present somewhat uncertain powers of standardization. With this in view one has less hesitation in accepting the statement made to the effect that glycerinated bile "is equally efficient after a year has elapsed;" but that this efficiency equals the efficiency of fresh bile, unglycerinated, is, as far as I am aware, unasserted by even its warmest advocates. Still, we may, in judging of the value of the glycerinated bile-system, place any loss of immunising power attendant upon the addition of glycerine over against the undoubted advantage possessed by this preparation in being free from risk of causing the disease.

When preparations have to be made to meet an advancing wave of the disease this claim to freedom from risk of spread is of the utmost importance. The immunity consequent upon the adoption of the glycerinated method may possibly be shorter lived and less marked than where pure bile has been used; still, it is probable that by this means a barrier would be presented which would effectually temporarily check the onward progress of the disease. Whether one would be justified in advising so fortuitous a policy in the event of a general outbreak is questionable, however.

The most which can be claimed from the application of the simple injection of glycerinated bile is that by its use a temporary or passive immunity is established, which protects inoculated animals for varying lengths of time. The duration of such protection is probably dependent upon the amount of the immunising substances contained in the bile used. This is without doubt a very inconstant quantity, and again depends upon such factors as the virulence of the disease to which the animal succumbed, its individual susceptibility, and perhaps age. That breed exercises a strong influence upon the course of the disease is undoubted. This was noted in Natal during our last outbreak. The grey cattle of the Russian Steppes contract only a mild form of the disease compared to the rinderpest known to the cattle-owners of western Europe. In India this race or

breed influence is again strongly marked, and the reactions of these various breeds to preventive measures seem to differ as widely. Such variation of susceptibility is quite in accord with well-recognised but ill-understood principles in the complex question of immunity, and as an instance in this connection we might recall that anthrax, a deadly disease of sheep generally, is powerless against a certain breed of Algerian sheep.

We are, perhaps, not justified in considering that that the bile furnished by an animal suffering from an acute and virulent form of rinderpest is on that account likely to contain greater quantities of the immunising principle than those contained in the bile taken from an animal succumbing to a mild or more lengthy form of the disease. In the rapid, or fulminating form of the disease, such as I have observed lately amongst young cattle in the Orange River Colony, it is improbable that the animal economy has time to elaborate to any great degree the resistive antitoxic principles upon which the value of the bile so greatly depends. It seems reasonable to suppose on the contrary that by an acute invasion of the animal system—causing rapid death without great tissue changes (septicœmia)—the specific organism is more likely to be found in the bile in an actively infectious condition. This may possibly explain the frail immunity obtained, and perhaps the contagion produced, in some of those cases in Natal in which bile was taken from animals dying early in the course of the malady or killed, according to Koch's directions, from the sixth day of the disease.

The fact that an animal eventually succumbs to a disease does not preclude the development within its system of certain immunising principles, and we have seen reason to believe that in some instances this immunising or antitoxic principle is present to a marked degree in the blood of animals actually dying from the disease.

In enteric fever in man the presence of the so-called agglutinating principles which are inseparable from the immunising or resistive principles, have been clearly shown to exist in the system as early as the fourth day of the fever, long before the crisis of the disease has been reached, and during the course of which these specific properties gradually increase.

From our practical observation we know that bile which has been taken from a beast which has died after the disease has run its usual course, is of greater value for immunising purposes than bile which has been abstracted prematurely. We have also found that animals which have recovered partially and then suffered a relapse ending in death, almost invariably have, when opened, biles which are not considered fit for use, being thick and grumous, and generally of offensive smell. Such galls, however, if appropriately treated would, in all probability be found to be of great immunising value.

It is interesting to observe in this connection a statement made by Dr. Rogers, the Bacteriologist to the Indian Government, to the effect that he experienced no drawback to the use of foul-smelling biles when glycerinised. He says, in describing the inoculation of cattle by this method :—"Again in three of the experiments biles were used which were originally foul-smelling, while Edington advises that only sweet-smelling biles should be used. This was done on purpose because a large proportion of the biles obtained from these animals (hill cattle) are foul-smelling, and unless they can be utilized the method would have very little practical value, and it is worthy of note that two such biles used on the eighth day after mixing with glycerine caused no abcess formation, while, strange to say, it was in one of these cases that the solitary success was obtained." This is another instance of the use of glycerine in treating rinderpest bile, for with this experience before us we may be induced to "give the benefit of the doubt" to the many biles the smell of which would cause hesitancy as to fitness for use.

The first Earl of Yarborough, about a century ago, introduced an odd but sensible way of stopping the practice of sitting late over the wine after dinner in the hunting season. At a certain hour the stud-groom entered the dining-room and announced that "the horses are bedded up," when the whole party rose from the table, formed a procession through the stables, and returned to coffee in the drawing-room.

Trout in the Little Mooi River.

MR. J. C. PAKKER informs the Minister of Agriculture that he has received a letter from Mr. L. S. Kershaw stating that trout from four inches long have been seen by the sons of Mr. W. T. Trafford in the Little Mooi River. On December 4th, 1900, Mr. Parker sent Mr Trafford 200 for putting into the river. Mr. Parker concludes his letter as follows :—"It is satisfactory to know that there is one more river stocked. Most likely the trout will stay and breed there."

"A Smuggling Adventure."

IN the next issue will appear, we have the pleasure to state, an account of an adventure under the above title from the pen of Natal's universally known and much esteemed old colonist, Mr. Charles Barter. Mr. Barter, we are pleased to state, is in good health.

District Reports.

BULWER, 14th December.—During the last three weeks the weather has been most changeable—sudden changes from extreme heat to very cold weather. Last Monday morning there was a cutting cold wind blowing, giving one the impression that it was winter instead of midsummer. Plenty of rain continues to fall almost daily in the vicinity of Bulwer, but beyond the mountain, about 12 miles from Bulwer, there has been very little. I hear the grub is very destructive this season to the crops; several farmers will have poor crops of mealies in consequence. In the upper parts of this Division it is too late to plant mealies in December, therefore it is no use replanting. There are any quantity of potatoes now to be got in the District; the price being about 15s. per bag. Mealies are being offered freely at 13s. per bag, but there is little or no demand for them. Plenty of wool is now being transported to Maritzburg, the bulk of which is coming from East Griqualand. The buildings of the new Magistracy at Himeville, Underberg District, have been started, and I am told there are 18 stonemasons at work, and if the necessary Native labour is obtainable it is contemplated the buildings will be finished in six months' time. The Bulwer Agricultural Hall is being pushed on. The full length of the one wall has been carried up to the full height, but the others have not reached half-way yet. It is to be hoped the hall will be completed before the next Show—to be held in June next. About 500 head of cattle belonging to Mr. James Cole, of Riverside, Dronk Vlei, passed through the village a fortnight ago from the vicinity of Ladysmith. The herd, I understand, is running on the farm Coleford, Indawana District, on the East Griqualand border of this Division. All the cattle seem to be perfectly healthy. I have heard of no sickness amongst stock in the Division, and, as far as I know, the District is free from disease. The Village Water Supply is under consideration, but I am afraid the expense will be so great that the majority of the property owners of the village will not accept the scheme proposed for a regular domestic supply. As for irrigation purposes, that is out of the question, as there is only a limited quantity of water in the springs.

H. W. BOAST, Magistrate.

INGWAVUMA, 30th November.—Rain fell on 12 days during the month, there were only five thunderstorms, and they were not of a violent nature. The other rains here were of a mild and pleasant kind, and mostly fell during the evenings. It has been a good month for planting, consequently everyone has been busy putting in mealie and mabele seed. The majority of the white inhabitants have also been taking advantage of the rains to give some attention to their vegetable gardens. A couple of herds of Native cattle are still infected with lungsickness, but I am glad to report that other herds which were affected have now been declared free. The stock are looking well on the whole.

J. R. HELLET, Acting Magistrate.

INANDA DIVISION, 13th December.—Since writing last, locusts have been very much in evidence in this Division, and large swarms have been hovering about all over the country. They seem to have shown signs of diminution during the past few days, and I hear they are dying off. This is no doubt due to their having deposited their eggs. I fear there will be an unusually large number of hoppers—as the swarms have been so general throughout the

Division. I have noticed that considerable damage has been done to mealies, in some places nothing of the leaves being left; only the central stalk remains As, however, the majority of mealies so damaged are still small, they will grow out, and recover from the effects of this. I have not heard of much damage being done to cane. This is probably due to the abundance of green grass and mealies at present, and locusts appear to prefer the latter to cane. We have had some very hot days, but cloudy weather has preponderated—though without much rain, and notwithstanding complaints I have heard that we were getting too much wet weather. I am of a contrary opinion—measurements prove that the actual rainfall has been small, and there are not wanting signs of parching; moreover, streams have as yet hardly been affected this summer, not an inch of rain has fallen here this month; for this time of year that is not enough. Following are some of the meterological observations for November:—Rainfall, 4·54 in., which fell on 17 days, the heaviest being 1·01 in. on the 8th. Max. temperature in the shade 110 degrees on the 28th, min. temperature 60 degrees on the 16th, and the mean temperature for month 74·2. I have not the figures by me, but speaking from memory I can say that one day this month the temperature has reached 100 degrees in the shade. At present we seem in for a dry spell, as the appearances are not favourable to rain. Stock continues to thrive, and the Division is at present clear of disease, no cases of horsesickness have come to my notice. There have been a few cases of influenza amongst horses reported; I do not, however, know of any cases at the present moment. I hear that enteric fever has been somewhat prevalent in one or two places amongst Natives, but I have not heard of any cases amongst Europeans. In the early part of the season there were signs of a heavy crop of mangoes, but I hear that the fruits have been largely attacked by some kind of blight, which cause them to turn brown and drop off, so that the crop will be small after all. This is a pity, as it is a favourite fruit, and is likely to be dear. Avocado pears are also said to be very few on the trees. This appears to be a very uncertain kind of fruit, only yielding a good crop once in several years. Mealies and tobacco have been very largely planted, and given favourable weather, the crops should be heavy; at present they are looking well.

JOHN L. KNIGHT, Magistrate.

IXOPO, 27th November.—During the last fortnight a considerable quantity of rain has fallen. Mealies are very scarce, as far as the natives in the Thorn Districts are concerned, and very large areas of ground are being broken up and planted by Natives—which shows they realise the advisability of providing food for themselves. The election of members for the Local Road Board takes place on the 12th December, and a meeting is to be held here on 7th December to decide whether this Magistracy shall be brought under the provisions of the Grass Burning Act, No. 31, 1895.

FRANK E. FOXON, Magistrate.

LOWER UMFOLOZI, 2nd December.—The past month was dry, and but little rain fell till the night of the 29th—continuing throughout the 30th in the form of general, drizzling, soaking showers. Slight showers fell also on the 16th and 24th. High hot winds from the north were very prevalent, and on the afternoon of the 28th a regular hurricane from the south was experienced. No fresh cases of lungsickness among cattle were reported. Certain two spans of oxen quarantined about the beginning of October last by the then Acting Magistrate, were released by Stock Inspector Gielink on the 28th. Cattle are generally doing well throughout the District, and are in good condition. Crops of mealies and sweet potatoes are most plentiful, though the former—save along the coast and about the Upangeni Mission Station—appear to be rather backward, owing, as natives say, to lack of early rains. Along the coast green mealies, from small early-planted patches, are actually being eaten, and, strange to say, kafir corn is, so far, very little in evidence. One small swarm of locusts passed the Magistracy, going south, into Umlalazi District, about the middle of the month, and another settled on the Ubonambi flats, but neither did any damage to crops.

A. R. R. TURNBULL, Magistrate.

NEW HANOVER, 2nd December.—There is nothing of interest to relate since my last report. The weather is remarkably cool for this time of the year. Stock is in the best of condition. A case of cattle stabbing—evidently the culprit was a Native—was reported about two months ago; otherwise cattle stealing or killing is a very uncommon offence as far as this Division is concerned, and I have only had one case of this sort to deal with during the current year.

A. BITTER, Magistrate.

NKANDHLA, 30th November.—The weather has been pleasant, the total rainfall for the month being 2·74 inches. The minimum temterature was 29 degs and the maximum 92 degs. on the 12th and 29th instant respectively. I regret to have to record three fresh outbreaks of lungsickness at the kraals of Msigiza, Chief Siswana; Ujana, Chief Siganganda; and at the kraal of the Chief Mpumela. The other herds still under license being R. J. Hutchinson, Empandhleni; Chief Sitshitshili, Jafta; Chief Moses Sikonyana; Chief Matsbana Ra, Sitshaguza. At the same time I am pleased to say the disease appears to be in a very light form, as few deaths have so far taken place. The pasturage at the present time is exceedingly good. Mr. J. R. Cooper, Stock Inspector, visited the District on the 7th inst. I regret to say that a considerable amount of sheep stealing is going on in the District. Twenty sheep were killed by a flash of lightning at the Ntingwe on the 19th inst. All crops are very backward and up to the present very little cultivation has been done in this neighbourhood and along the border. A few small swarms of locusts have been seen about the District. During the month 39 head of cattle, 119 goats and 2 horses were

brought into the District from the Transvaal by Natives, also 1,700 odd sheep belonging to Mr. H. T. James and Mrs. Pretorius, of the Entonjaneni District. Dysentery has been bad, five deaths having taken place at the Etaleneni Mission Station, and several Natives in this neighbourhood are still suffering. Small Boer patrols are to be seen daily along the border, near the Babanango, but no looting has been done by them during the month

C. C. FOXON, Magistrate.

UBOMBO, 6th December.—The mealie crops appear healthy, but are backward and less in quantity than in the last two years. This, however, cannot be attributed to adverse planting conditions, but to the last year's good yield, and its attendant social functions. Some artichokes have been cultivated on the mountain. The cattle on the mountain are free from disease and in good condition. The game in the District is being watched for any deaths from rinderpest; as yet none have been reported. The Government reward for the destruction of wild dogs, it is to be hoped, will be attended with the production of many scalps, for wild dogs are a most useless evil; they are as destructive to small game as rinderpest. Last month's rainfall was heavier than the last, being 3·36. Maximum and minimum temperature 87 deg and 53 deg.

J. M. ROBERTSON, Acting Magistrate.

UMLALAZI, 15th December.—Very hot days have been experienced during the past fortnight, the thermometer rising to over 100 deg. on more than one occasion. After one such day this week a somewhat severe thunderstorm burst, the lightning striking a tree and setting fire to some rubbish, finally entering the ground, leaving a deep perpendicular hole. This hole was shown to me, and is within 20 yards of the house of Mr. G. Gielink, Stock Inspector, near the Matikulu River. A fair amount of rain has fallen. Young locusts are hatching out in considerable numbers, but I have hopes of destroying many of the swarms by burning the old grass which has been left for this purpose on their breeding grounds. Anthrax has broken out in a herd of cattle in the District, and I regret to say one Native has died, and several others are ill from the effects of eating the meat of the dead animals. This they persist in doing after repeated warnings, and notwithstanding the fact that last year a woman died in the same kraal and from the same cause. Lungsickness is still in the District, but does not appear to be spreading, owing to the admirable quarantine maintained by the Stock Inspector.

J. J. JACKSON, Magistrate.

WEENEN, 14th December.—The road between Estcourt and Weenen has been lately chained off, showing the distance to be about 22 miles. That this is correct is strongly questioned by most of the residents, who are of opinion that a mistake in the measurement has been made. By common repute the distance is about 25 miles, and two or three cyc'ometers have registered it as over 23. But the overestimation of distance is a common fault, and the official mileage may probably be taken as correct. This road, by the way, is, in places, in a deplorable condition of disrepair, and it is to be hoped that a gang may soon be detailed off to attend to it. The thermometer has registered over 100 deg. in the shade on several days lately. Another fall of rain would be a welcome relief from this oppressive heat. The Natives of this Division, owing probably to the high wages paid by the military and other employers, are in an extraordinarily prosperous condition as regards ready money. As an example of this may be mentioned the fact that at a Branch Court held last week at Umhlumba fines amounting to £540 were paid by them. Judging from the readiness with which the various sums were handed in, their exchequers were by no means exhausted by this drain.

C. G. JACKSON, Acting Magistrate.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 15th January next:—

New Germany.—Bay mule mare, treading with right hind hoof sideways, no other particular marks or brands, fair in condition.

Mooi River.—Dark chestnut gelding, long square tail, long hogged mane, both hind and near fore-fetlocks white, large star on forehead, little strip on nose, branded on near hind leg EB.

Dronk Vlei.—Bay horse, height about 14·2, age four years. Indistinct brand on right hip, looks like Cz.

Acton Homes.—Bay gelding, branded on the right leg GD. Bay mare, branded on the right shoulder P.

Nqutu.—Two sheep (ewe and lamb), no brands.

Boston.—Grey mare, square tail, white face, near hind foot white, has had a sore back. Bay mare, nick in bottom of off ear, with young filly foal, bay.

Estcourt.—Black mare, branded JL right leg, and left leg O, very wild and vicious. Impounded by Native Untute by order from Court. Bay mare, branded MC over U right buttock, white splash on forehead, right hind foot white, and white marks where saddle goes on back, piece out of right ear, very wild, and old marks on front legs, like knee-halter marks.

Harding.—Bay gelding, thick-set, about 14 hands, black points, off front foot little white, star on forehead, aged, no brand. Bay gelding, about 13 hands, 3 years old, black points, star on forehead, white hind feet, no brand.

Ladysmith.—Grey mare, about 14½ hands high, tail and mane medium length, no brands visible, six or seven years old.

The stock impounded as hereunder will be sold, unless previously released, on the 5th February next:—

Candella.—Bay mare, about 14 hands high, little white star on forehead, tail and mane been cut, shod all round, with headstall on, in fair condition.

Boston.—Running on the farm Inhluzani: Black-and-white cow, 6 years old, white back, legs, and belly, red inside ears, no brand; will calve shortly.

Petroscar, Fugitive's Drift.—Brownish-black mare, with star, 4 years old, branded PM on right hip three white feet, switch tail. Small brown mare mule, branded S in circle on right hip, harness marked, very wild. Small dun-coloured mare mule, branded S in circle on right hip, and P on left thigh, harness marked, seems blind.

Greytown.—Bay mare, star on forehead, hollow-backed, long tail, no brands or marks visible, with bay colt foal about one year old. Dark-brown mare, star on forehead, front leg white up to knee, branded looks like JR joined on right hip, with bay colt foal, white face, no brands visible, aged about three months. Running on the farm Haartebestvlagte, Umvoti County, and reported by Mr. R. Torlage as too wild to be driven to the Greytown Pound: Black heifer, long slit in each ear, branded CH, age about three years.

Richmond Road.—Black yearling filly, no marks or brands.

Springfield.—Running on N. Van de Merwe's farm, Vaalbank, Gourton: Two-year-old stallion, dark-brown, branded ASL (indistinct), right hind leg white, very small star on forehead. Probable value, £8. Will be sold one month from date of advertisement (16th Dec., 1901), unless previously released.

Rinderpest Notice.

UNDER Government Notice No. 506, of 1901, I hereby grant permission to all owners having stock in that portion of the Klip River Division north of Sunday's River and west of the Railway Line; in that portion of the Newcastle Division west of the Railway Line; and in that portion of the Newcastle Division north of the Ingagane River and east of the Railway Line to inoculate their cattle with Bile. Owners should send to the Bile Station at Bester's Station seven per cent of their cattle, such cattle to be between two and four years old, and in low condition if possible. Bile will then be issued to them free of charge for a double inoculation of their cattle. Owners wishing for a single inoculation only, should send in three-and-a-half per cent. of their cattle. Owners not sending in three-and-a half or seven per cent. of their cattle will be charged 5s. per dose for such Bile as the Department can supply There is only a limited supply of bile and serum at present. A charge of 2s. 6d. per dose is made for serum.

It is desirable that glycerinated bile be used—in any case for the first inoculation—as there will then be less danger of starting fresh centres of the disease. Glycerine will be added to Bile free of charge.

S. B. WOOLLATT,
Principal Veterinary Surgeon.

Maritzburg, 16th December, 1901.

Weekly Rinderpest Reports.

TO 17TH DECEMBER, 1901.

LISBON and Schoon Spruit.—Nothing to report.

Zand Spruit.—Two deaths occurred here on the 7th December and two on the 8th December. Three of these were yearlings and one a calf of two months old.

Van Reenen's Dipping Station.—Nothing to report.

Kirkintulloch.—Since last report there have been five deaths—two four-year-old animals, two yearlings, and one small calf. All the stock on the farm, with the exception of 32 which have been isolated and not inoculated on account of lungsickness, have been inoculated twice with bile.

Reitfontein.—No fresh cases reported. The cattle are being inoculated a second time with bile.

Normandien (Newcastle Division).—An outbreak occurred here on the 13th December. District Veterinary Surgeon Hutchinson is in charge, and has inoculated all the cattle with bile.

Farm Jammerdaal (Krantz Kop Division).—Rinderpest was reported here on the 14th December. The Principal Veterinary Surgeon has proceeded to the spot to investigate.

Matashana's Ward (Nkandhla District, Zululand).—Stock Inspector Cooper reported rinderpest here on the 15th inst. Two dead, two sick. Appliances for inoculation with bile have been sent to him. The cattle are strictly quarantined.

(Signed) M. J. HIME,
For Prin. Vet. Surgeon,
17th December, 1901.

Secretary, Transvaal Administration, to Prime Minister.

Telegram. 13th December, 1901.

13th December, M. 316. Following is state of rinderpest as reported for past week :—

Zeerust, Krugersdorp, Volksrust.—No cases.

Middleburg.—No fresh outbreak.

Boksburg.—437 cattle inoculated, of which 43 took disease and 20 died.

Standerton.—40 fresh cases during week ; no deaths.

At Military Dairy Farm.—107 have died.

Principal Veterinary Officer Army reports no disease at present east of Belfast, including Lydenburg and Barberton ; but, on the northern line, disease is general up to Pietersburg.

Queensland Cattle.

THE Government has imported, and is now distributing amongst certain farmers adjacent to the railway, for experiment and care, one hundred heifers and three bulls from Queensland. These animals have come from tick-infested country, and are said to be proof against redwater. The Government has imported these animals with a view to ascertaining whether they will be immune from redwater in this Colony. The Government Bacteriologist (Mr. Pitchford) has charge of the cattle, and is conducting the experiment.

Paspalum Dilatatum Propagation.

MR. WILLIAM CARTER, Highthorn, Estcourt, writes :—

A small quantity of the seed was sown about the 1st December in fairly good soil, and was watered regularly by means of a hose. Germination, as usual, proved slow, and many of the seeds proved sterile. About six weeks after sowing a few plants came through, and are now about two inches in height, so it will be seen that their growth has been by no means rapid. The common land grasses have proved troublesome, and threaten to smother the *Paspalum dilatatum*. I think that the only means by which the latter grass can be saved is by transplanting it into clean land. I would have picked the land grass out by hand, but as it is not easily distinguishable when young from the *Paspalum dilatatum*, I let it be for fear of doing more harm than good. I intend sowing the rest of the seed next January, as I think it likely to succeed best when sown at that time.

Agricultural Chemistry for Beginners.

CHAPTER III.

By Archibald Pearce.

NITROGEN AND AMMONIA.

NITROGEN is an element of the highest agricultural importance. It is another gas, of which four-fifths of the air by measure consist. By nature it is exceedingly inactive, and does not readily combine with other elements, and this is the reason why, although so abundant in the atmosphere, various nitrogenous manures have often to be applied to the soil; for all plants must have nitrogen for their growth, and only a few have the power of obtaining it from the air. In the air it acts as a check on the active and vigorous oxygen, diluting it, as it were, and preventing the too violent actions that would otherwise take place. The nitrogen that plants need is never absorbed into their tissues in its elementary form, but always in the shape of its compounds; accordingly nothing further will be said abont it, but we shall proceed at once to its compounds, of which the chief are Ammonia and Nitric acid.

Ammonia and Alkalies.

Ammonia introduces us to a class of compounds called *alkalies*, which are exactly opposite in their qualities to acids. They have a kind of soapy taste, and if applied to litmus paper that has been reddened by an acid they restore its blue colour again. Litmus paper is thus very useful as a test; an acid substance reddens it, an alkaline substance turns the colour back to blue, and if no effect is produced on either the red or blue paper the substance is said to be neutral. The alkalies act as bases, inasmuch as if mixed with acids they produce salts. The best known, besides ammonia, are caustic potash, caustic soda, and the alkaline earth lime.

Ammonia is a compound of nitrogen and hydrogen, in the proportion of 14 parts by weight of nitrogen to 3 of hydrogen. It is in reality a gas, but is very soluble in water, and this solution is the liquid commonly sold as ammonia. It is in almost all cases the product of the de composition of animal or vegetable substances containing nitrogen. If a tuft of hair, or a few feathers, or a piece of horn be heated in a thin closed glass tube over a flame, we shall observe a few drops of a more or less evil-smelling liquid produced, and if we test this with red litmus paper, the presence of ammonia will be shown by the change of colour to blue. If a rotting manure-heap is allowed to get too dry, we can often smell the escaping ammonia, or show its presence by laying a piece of red litmus paper on the top, proving that the valuable nitrogen is being wasted. Any chemist will supply a little red or blue litmus paper for a few pence. The chief commercial source of ammonia is the gas-works, where illuminating gas is distilled from coal, which contains a small proportion of nitrogen; the ammonia is dissolved by the water in which the gas is washed, and the various ammonia products are manufactured from the solution.

Ammonia is generally believed not to be easily, if at all, assimilated as such by growing plants; it must first be converted into nitrates, as will be described in the next chapter. Most soils have the power of absorbing and holding ammonia, and not allowing it to be easily washed away, a property that is often of importance in a country subject to heavy downpours of rain.

Ammonia very readily combines with acids, acting as a base, and forming salts of ammonia, generally called ammonium salts. The best known of these are sulphate of ammonia (ammonium sulphate) and sal-ammoniac (ammonium chloride). The ammonia in all ammonium salts is easily expelled by the action of lime; one can illustrate this important fact by mixing a small quantity of sal-ammoniac or sulphate of ammonia with a similar quantity of lime, when the ammonia

given off is easily perceptible by the smell; in fact, such a mixture forms an efficient filling for smelling-bottles. From this we can see that lime must never be mixed with any manure containing ammonia on pain of losing its most valuable ingredient. This is the reason why Thomas Phosphate (basic slag), which contains free lime, should not be mixed with sulphate of ammonia, and why it is dangerous to put lime on a manure-heap.

Sulphate of Ammonia.

Almost the only form of ammonia compound used as a fertiliser in this country is the sulphate. This should be in the form of a pale bluish-white powder. When chemically pure it contains 21·2 per cent. of nitrogen; but a good commercial sample will give about 20 per cent., equal to about 24·3 per cent. of ammonia. A rough test may be easily made of its purity by placing a small quantity on a piece of red-hot iron, when it should almost entirely volatilise, or disappear as vapour, as all ammonium salts will. Any residue remaining is an impurity. It is the most concentrated form of nitrogenous fertilizer, and is thought to be most effective on strong clayey soils, but not so suitable for those rich in lime, as a loss of ammonia will probably ensue, due to the action of lime already spoken of. For cereals, potatoes, and turnips it has proved valuable; it may be mixed with bones, superphosphate, and guano, and is the commonest form of nitrogen compound found in "special" fertilisers. Being so rich in nitrogen, about 1 cwt. per acre is usually sufficient to apply.

Nitrogen in Analyses.

If a chemist has to examine a manure or a soil, one of the chief points he has to report on is the amount of nitrogenous substance it contains; and in order that the relative values of different manures, etc., may be easily compared, he tells us, as a general rule, how much nitrogen there is present, regardless of the particular compound form in which it may exist. He does not usually say there is so much nitric acid, or so much sulphate of ammonia, and so on, but lumps them all together and says there is so much nitrogen. But occasionally we find that instead of this system he calculates how much ammonia the nitrogen is equivalent to, and reports that there are present nitrogenous compounds equal to so much ammonia. It will, therefore, be useful if we can perform the calculation for ourselves, so that we can compare analyses arranged on these different methods. From what was said above as to the composition of ammonia, it will be readily seen that to convert the percentage of nitrogen into its equivalent of ammonia we must multiply the former by $\frac{17}{14}$ or 1·215; and *vice versa*, ammonia may be converted into its equivalent of nitrogen by multiplying by $\frac{14}{17}$ or ·824.

Questions.

1. What are the chief constituents of the air?

2. How can you distinguish between an acid and an alkali?

3. If you added ammonia to nitric acid, what compound would you expect to be formed?

4. If you used hydrochloric acid instead of nitric, what would you get then?

5. How could you tell when you had added enough ammonia to neutralise the acid?

6. If a manure contains $8\frac{1}{2}$ per cent. of ammonia, how much nitrogen is that equal to?

7. Why is it wrong to mix sulphate of ammonia with basic slag and not with bone-dust?

8. Could you prove that a piece of flesh contains nitrogen?

Some observations made in France have led to the conclusion that it is highly probable that onions grown on beds that have been manured with sulphate of potash will keep sound and good for a much longer period than others of the same variety grown on land where the sulphate of potash has not been applied.

At a time when so much ambiguity prevails concerning what sort of animal is required for a British cavalry horse, the conditions which govern the class of new York shows for "horses suitable for cavalry service" are worth quoting. The competitors must be geldings not under four years old, from 15 h. 1 in. to 16 hands high. They must be sound and well bred, gentle under the saddle, free from vice, with free and prompt action at the walk, trot, and gallop; whilst they must weigh not less than 950 lb. or more than 1,150 lb.

Veterinary Departmental Report for October, 1901.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

MY time during the month has been chiefly occupied in the official work of the office.

Lungsickness.—This disease has increased again in the Klip River County owing to the military authorities exchanging young stock for oxen, which young stock was affected with the disease and was distributed about the county, more particularly round Ladysmith. Outside of the infected areas, that is in Natal south of the Tugela, there were only eight cases under license. Three thousand and one head of cattle were admitted to the clean depôt at Spionkop during the month, and 1,602 allowed to leave that depôt and come south of the Tugela; 36 deaths occurred in the depôt, the majority from gallsickness; two, however, died of lungsickness amongst Mr. Piccione's troop. This herd was kept strictly isolated. At the depôt at Pieters 415 oxen were admitted, and 402 released and allowed to come south of the Tugela.

Scab.—This disease appears now to be on the decrease.

Rinderpest.—Many cases of rinderpest have been reported during the month, but upon investigation have been found to be some other trouble. A case occurred, however, on the farm Doornhoek, near Van Reenen's Pass, amongst a troop of 150 head of cattle belonging to three natives. Special report upon the outbreak has been sent in to you.

Horsesickness.— One case reported from Durban.

Glanders.—Some cases were found amongst military horses arriving per SS. "Custodian" from England. The animals were tested with mallein, and those reacting to the test were destroyed.

S. B. WOOLLATT,
P.V. Surgeon.

IXOPO. - D.V.S. VERNEY.

Scab.—Lambing having finished and shearing having commenced, associated with a good supply of green grass, there should be considerably less sheep scab in the districts.

Lungsickness.——No fresh outbreaks of this disease.

Rinderpest.—No fresh outbreaks of this disease have occurred in East Griqualand, which certainly indicates what a valuable agent bile is when properly handled. Rinderpest is said to exist in the Bazana District, Pondoland, native cattle being affected.

As per usual I have been very busy doing a large amount of castration in horses.

A case of threatened redwater occurred in an imported bull, but under my new treatment for this disease the animal made a good recovery.

GREYTOWN.—D.V.S. CORDY.

Scab.—One fresh outbreak occurred in the Western Umvoti Division.

Glanders.—None.

Rinderpest.—None.

General.—A few cases of quarter-evil were reported from the Western Umvoti Division.

I resumed the duties of District Veterinary Surgeon on the 19th of the month, after having been with the volunteers since the middle of the previous month.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—Twenty-three outbreaks have been reported during the month in the Klip River Division. A large quantity of young stock was brought into this Division by the military authorities from Orange River Colony some time previous to the issue of the recent proclamation prohibiting the entry of cattle from the Orange River Colony, and bartered by them in exchange for trek oxen, with the result that the majority of the animals so disposed of have since had to be placed under license for this disease. Eighteen fresh outbreaks have been reported in the Division of Newcastle, these, in a great

measure, being due to the large movement of transport during the past two months. In the Divisions of Dundee, Umsinga, and Upper Tugela, the outlook continues more encouraging. Only four outbreaks are reported from Dundee and two from Upper Tugela.

Scab.—There is a considerable falling off in the number of cases of this disease. Only six outbreaks have been reported during the month throughout the whole of my District.

DURBAN.—D.V.S. AMOS.

From the 17th of September to the 18th of October I was on duty with the Natal Volunteers as P.V.O., being called out for active service for the second time.

Since my return I have examined personally all incoming ships with stock on board, military or otherwise. In one military ship (the "Custodian" from England) I found two cases of suspicion which afterwards proved to be glanders. These horses were tested at Lord's Ground and were immediately destroyed.

Horsesickness.—Horsesickness has prevailed during the month, but no cases have come directly under my personal notice.

I beg to draw your attention to the condition of the compound. It is a very serious matter indeed that the fence should be allowed to remain in its present condition. The sand is level to the top of the fence on the inside and outside, and anyone can with ease walk into the compound from the shore; and, again, the fence is being very badly strained the whole length.

HOWICK.—D.V.S. BYRNE.

I have been absent from my District doing duty in Durban from October 1st to the 21st, when D.V.S. Amos returned from the Front and took over his District again.

During that period the arrival of animals by sea were:—Seven stallions, 86 horses, 2 mules, 11 dogs, 44 goats, 2 pigs, 2 cows, 1 calf, 5 heifers, 2 bulls, 3 oxen.

The 5 heifers and 2 bulls arrived with a tuberculin certificate from England.

I resumed duty at Howick on October 22nd.

There have been two fresh outbreaks of scab in Upper Umkomanzi Division.

There is no lungsickness, glanders, or rinderpest in this Division. There have been several cases of sickness in cattle during the month from gallsickness and tulip, but most of the cases recovered.

In Lion's River Division there have been five cases of scab.

There is no other contagious disease in this Division.

In the Umgeni Division there are four cases of scab and two of lungsickness.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc: 37, 1900. For the month of November, 1901.

Date.	Description.	Quantity.	Imported from.	Ship.	Remarks.
1901.					
Nov. 1	Potatoes	100 Bags	Melbourne	Australasian	Free of Pest
„ 12	Ornamental Plants	1 case	London	Inyati	„ „
„ 13	Apples (Sul, hured) ...	39 casks	Hobart	Gulf of Anend	„ „
„ 14	Potatoes	1,494 cases	Melbourne	„	„ „
„ 22	Ornamental Shrubs	20 tins (p'ffin)	Cape Town	Pembroke Jastle	„ „
„ „	Lemons	230 cases	Malaga	Umsinga	„ „
„ „	Oranges	25 „	„	„	„ „
„ „	Grapes	390 barrels	„	„	
„ 27	Potatoes	900 cases	London	„	„ „

C. B. JONES, Examining Officer, Agricultural Department.
Custom House, Durban, 4th December, 1901.

Frieslands, etc.

INTERVIEW WITH MR. P. OTTO, J.P.

By ERGATES.

HALF way between Mooi River and Greytown lies the broad, long valley or basin known as the Riet Vlei of Natal. Here are to be found representatives of some of the best known old colonial names—Otto, Norton, Varty, Robinson, and others. Within the valley may be seen some twenty homesteads, the most of them being only five or ten minutes' walk of one or other. The land of the respective homesteads, so to say, radiates on to the surrounding hills. This amiable proximity of the dwelling-houses is a curious feature to the average colonist, and demands investigation. The only explanation obtainable goes back to the times of the earliest settlers. It is supposed that mutual protection was the motive of the close congregation. Mr. P. Otto, whose farm Somerville is situated at the northern end of the valley, is the best known breeder of Friesland cattle in Natal, and to him I went to learn what he would say with respect to the breed of his special stock.

"You were the first to import pedigree Frieslands?"

"No, no; my father was the first. He began in about 1855, and I have gone on. My own importations have been fifteen bulls and seven heifers."

"You have always kept to Frieslands?"

"No; about twenty years ago I tried Shorthorns. After five years' experience with them, I gave them up. They did not thrive, they were poor milkers, their coats were long and harboured myriads of the small blue ticks which teem in this district as the autumn approaches. I had to clip them! The Frieslands, also called Fatherlanders, and Holsteins did admirably. Our veld is sweet; the troop get nothing but what they can find in the veld. Frieslands grow to an enormous size. They are not a rapidly maturing breed like the Shorthorn, but they are long-lived; plenty of oxen I have worked – and Frieslands work splendidly in the yoke—till seventeen years old, and then let them run to get into condition for the butcher."

"But Frieslands are regarded by many as soft; it is held that where the breed originates the conditions are those of bovine luxury: up to their knees in rich meadow grass half the year, and carefully housed and fed during the other half of the year."

"The hardiness of animals, I imagine, is not lessened by the fact that they come of stock carefully nurtured. It is certainly not so with human beings. But, be that as it may, I can say that under conditions such as mine they are not in the least delicate. I hold they are hardier; and I believe I have no senseless bias in favour of one breed over another, than any other class of imported cattle, and the cows admittedly are in the first rank as milkers. It is remarkable how people swear by the breeds they have; and all of them, I daresay, are right according to their locality. The calves go down to my winter farm Saxony, where gallsickness is prevalent, and where some always die from that sickness. Reit Vlei is also subject to quarter-evil. Stock that I breed I can, therefore, pretty well guarantee to be immune from the most fatal maladies of South Africa. They do well wherever I have sent them. From Durban to Bulawayo I have supplied cows and heifers, and they have all done well. I sell the cows at from £40 to £60, and the demand is greater than I can meet. I never sell a cow, however, until I have some of her progeny to keep the herd going."

"What quantity of milk do the cows give?"

"Off the veld they give from 15 to 20 bottles a day, but, of course they would give much more if fed. I milk only once a day, and I find the calves do better. All the cattle, as you have seen, are remarkably quiet. There is no difficulty whatever in milking the cows without their calves; to either way they take naturally."

"What was your rinderpest experience?"

"At first I biled the whole lot with bile sent me by Mr. Pitchford. About

four months later rinderpest and lung-sickness broke out at the same time. I then got serum ; the first lot was good, but a second lot I got unfortunately caused what was apparently blood poisoning. I found, at least I believe so, that Friesland are not so susceptible to rinderpest as other cattle. Here, I think, is the explanation : Holland at times has been visited with rinderpest, and there is the probability of her stock being still immune in some degree. When my cattle leave here for wintering on my Thorn farm their coats are full of the small blue tick, but with the first frost the ticks fall off, and in July the cattle are fat and sleek. Before the winter oats took rust I used to keep the calves here."

"And about colour ? "

"I prefer as much black as possible. I agree with what Mr. Simmons said about white and mange ; and there is another drawback to white ; the hair is twice as long as the black, and, in consequence, affords better harbour for ticks. As to red I should have no objection, but red pedigree Frieslands are scarce, and it is not characteristic of the type, and if I were to breed from that colour for sale most people would imagine them to be cross-breds. I have never heard of any reds, or, rather, red and whites, being imported into Natal. I have never heard it claimed that the reds are hardier. For scours my common remedies are an egg smashed up, shell and all, or two tablespoonfuls of castor oil and five drops of laudanum. The Friesland crosses well with nearly all breeds ; with the Africander a splendid large and heavy ox for the butcher or transport-rider is got. Crossed with the Zulu one gets good size with constitution of the toughest character."

The bull Okkinga is one of the quietest bulls I have ever seen, and Mr. Otto says that all he has had are the same in that respect. The shortness of Okkinga's black hair was astonishing ; no grip of it could be got between forefinger and thumb. "Cecil Rhodes," another bull, runs day and night with the cows on the hills. The Show trophies—a blaze of silver tankards, centre-pieces, etc.—overflow the dining-room sideboard, and are accommodated on stands which flank each side. There is another trophy of perhaps greater interest to a visitor, especially if the weather be rainy, which Mr. Otto laughingly claims to have come out of Frieslands, namely, a billiard-room and a first-class colonial-built table.

HORSES.

"And about your horses ? "

"None could have wished for a more satisfactory mare than my thoroughbred Topsy. She brought me over £900, and all her progeny were winners on the turf. For nine seasons running she had foals —or stop ! one year she failed, but in the year following she made up by having twins. She had a foal when twenty-three, and in the following year she was killed by lightning. During the last four years I have had the Hackney mare Limewash —bred by Sir Humphrey de Trafford. I believe in crossing the Hackney mare with the thoroughbred, especially the light breedy class of mare such as Limewash. Every farmer, in my opinion, an opinion also strongly expressed by Mr. C. B. Lloyd in the *Journal*, should keep a couple of mares, and get them covered by the stallions he fancies. He should do them well ; that is, give them some food at night and stable them, and groom every day. Their cost on a farm where there is any cultivation is very small, and for that they will more than pay if he only uses them for scuffling and such-like farm work."

SHEEP.

About sheep Mr. Otto said :—"I keep only a stud flock of Rambouillets. Formerly I used to run an ordinary flock, but this is not sheep country, and I have given them up, or, rather, they gave me up. With my stud flock it is different ; I can give all of them individual attention. I have had the flock for twenty-five years, and it has long been pure bred. Fresh blood I frequently get from France and Germany. I sell all the rams I can breed at £10 per head. A good many farmers who have been going in for black-faces in unsuitable districts are coming back to the merino, and are sorry they ever changed. Against blue-tongue I dose them. I give 20 drops of muriatic acid in a wineglass of water. In bad cases I repeat, and keep under cover, and feed on milk."

"Are the weights good ? "

"Yes, they scale well ; a 6-tooth wether killed a short time back scored 80 lbs.

dead weight. A 6-tooth ewe I put on the scale this year showed 155 lbs. live weight. The average clip of wool from the flock is 11 lbs.; a 2-tooth ram gave 16 lbs. My father was the first to import pure-bred Rambouillets into Natal."

ANGORAS.

"Goats do well here, but I had a troublesome flock—regular travellers. No wire fence could keep them in, and the stone walls they used as promenades. I found them to be a nuisance and got rid of them. They are all, as you know, wretchedly bad mothers, always ready to desert their kids. My neighbour, Mr. T. B. Varty, has a fine flock doing well and not inclined to stray."

PIGS.

"I breed from Berkshire and a Middle-white boar—pure bred. The litters, curiously are always white. This cross gives splendid bacon. At eight months out of a litter I killed last winter the smallest weighed 192 lbs. and the heaviest 240 lbs.—clean. Of course I do them well. They all run out a couple of hours every day. I feed them on separated milk, umbuya, vegetable marrow, and peaches; the last comes out in the flavour of the meat. At the end, for topping off, I give mealies. The pigs always get a few, very few, mealies. I do not look on them as good pig food. Next season I intend crossing the Berkshire with the Tamworth. The cross should be good."

POULTRY, ETC.

"The Silver Dorking which I now keep are first-rate farm birds, good layers, and good for the table. I have taken lots of prizes with them. The ducks are Aylesburys; they are strong, hardy, and grow quickly. I can sell any quantity at two guineas a pen, a drake and two ducks. They travel during the day a long way up the spruit, but they always come back at sundown. The turkeys are American Bronze; I find them very hardy, and they grow to 30 lbs. weight, and pay well at from 20s. to 30s. or at 1s. 3d. per lb.—and selling by weight is the most satisfactory. They are splendid mothers; all feed in the field." At Somerville the Belgian hare is also to be found—and to be found thriving well in all stages from the size of a mouse upwards. Under this heading I include a brace of Kafir cranes, but not kept for profit. One of them goes by the name of "Sir Walter." He used to reside at Government House, and was well known to Maritzburgers during the late Governor's term of office in Natal.

BARLEY WHEAT.

Mr. Otto is not a cultivator on a large scale. He makes sure of growing all his stock can possibly want, and it is only the surplus which he sells. About the ordinary crops there is no need for lengthy remark, but some special reference to the beardless barley, barley wheat, or Nepaul wheat may be useful. Large quantities in bale are being, as many know, largely imported into the Colony. This is what Mr. Otto said:—"I have used it largely for several years as green fodder; in the Cape they work horses on it green. Cut as forage it is also excellent. My neighbour, Mr. Tom Varty, says it is the best of all forage. Horses eat up cleanly every bit of it. The grain is also first class for poultry. It has no beards to get into the gums of horses. I grow my own seed for three years; after that it deteriorates, and I then get fresh. Frost does not hurt it; it should be watered in winter. If it is grazed it is apt to be pulled out, for the roots are shallow. When the soil is in good order I sow it broadcast, and then plough it in—about three inches. It is the quickest of green fodder plants I know."

MEALIES AND MANNA.

Mr. Otto grows the Golden Beauty, a yellow mealie, chiefly. He finds that it grows as quickly as the Hickory King, but that it has not the disadvantage attaching to that mealie of shedding its corn in the field. Having heard good accounts of the manna he is giving it a trial. His first sowing took three weeks to come up, so he soaked the seed for the second lot. He recommends putting it into boiling water and allowing it to soak for 24 hours, and in sowing it to mix it with sand.

IMPLEMENTS.

Mr. Otto spoke very highly of a Jack's harrow which he got from Messrs. Mason and Broadbent, Maritzburg. It is very strong and goes well into every undulation, and if turned over it makes a capital

chain harrow. He prefers the second size. McCormack's Daisy self-delivery reaper he also spoke of very highly. He got his from Messrs. North & Sons, Durban, the price being £25. It cuts forage beautifully, and with it he can easily get through eight or nine acres a day. About the Cambridge roller he was enthuiastic: "I don't know how I managed before I got it. Every farmer ought to have one. The price charged for it, however, is, I think, unduly high."

Were the subject not too personal I should like to write something about the exceptionally beautiful flower garden, the fancy pigeons, the large aviary, and other common adjuncts of the farm which go so far to account for the attractions of country life.

Maggot Fly: Myiasis.

AUCHMEROYIA (BENGALIA) DEPRESSA, WALKER.

BY CLAUDE FULLER, Government Entomologist.

COAST readers will, perhaps, be interested to learn that the human parasite so well known by the above distasteful title has made an early appearance this spring, authentic specimens having been sent to me by Stock Inspector W. C. Robbins from Umhlali during November.

I have not previously discueed this particular pest in these pages, chiefly because there are so many points to be cleared up with regard to its natural history, that one could not feel satisfied to give an account of the insect without elucidating some of these. It now, however, appears the wiser course to make some mention of the fly, in order that those who have the opportunity of observing it and its habits will do so more critically than hitherto, and really try to discover the truth without taking anything for granted.

The pest, which we call the "maggot fly," belongs to a group of two-winged flies known as the *Sarcophagidæ*, the members of which are more commonly spoken of as "flesh flies," because the eggs are laid upon dead animal matter, and the young or maggots feed therein.

Many of the *Sarcophagidæ* are viviparous, that is, the young are born in an active state, the eggs being hatched in the maternal abdomen; a well-known instance of this is the common blow-fly, which, in a general way, resembles the maggot fly, though not belonging to the same sub-family.

Some of the *Sarcophagidæ* are parasitic in their younger stages upon locusts and other noxious insects, the eggs being deposited upon the bodies of these hosts and the young larvæ eating into the tissues through one of the joints between the segments. These larvæ or maggots feed upon the internal tissue of the locust and so destroy it. They are, therefore, looked upon as beneficial insects, and in certain parts do much to keep under destructive species. Another fly which also belongs to this group is the adult form of the "screw-worm." This species has the habit of occasionally depositing its eggs in the nostrils of mammals, and even human beings, and the maggots which hatch perforate the tender membrane, causing horrible sufferings, and at times death. A number of flesh flies also deposit young in wounds, and the maggots develop there; one instance of this kind came under observation last year.

The maggot fly is not restricted to Natal, but it is also known further up the coast, and has been recorded from Delagoa Bay, and forms the subject of several notes by various writers, and has been commented upon in the Transactions of the South African Philosophical Society by L. Peringuey, the well-known Entomologist at Capetown. Similar cases of Cutaneous Myiasis are also recorded from the Senegal, the fly being called the Cayor fly (*Ochromyia anthropophaga*, Blanchard).

The specimens collected for me last season were kindly determined by a specialist in this respect, Mr. D. W. Coquilett, of the Entomological Division of the United States Department of Agriculture. Mr. Coquilett referred the species to *Auchmeroyia depressa*, Walker,

or, as it has been more generally termed in other writings, *Bengalia depressa*.

So far as the attack of the fly is concerned, I think it may safely be said that last season alone there were some hundreds of patients who passed through the hands of various medical men and who suffered from this form of parasitism to which the term "Myiasis" has been applied.

For my own part I have met two or three dozen parties who suffered, though I was always too late to see more than the scars left after the maggots had escaped.

In one case a child under six months of age had had between 20 and 30 taken from the scalp, and in the majority of cases this seems the part most subject to invasion. In other cases the cartilageous portion of the nose was attacked, and maggots were commonly found in the skin of the chest, stomach, back, arms, buttocks, and legs. In another case the finger of a baby was invaded, and two cases of attack in the scrotum were mentioned to me by reliable witnesses.

In no instance have I had any direct evidence of natives suffering from the pests, but I have flies reared from larvæ taken from the body of a coolie. Dogs and rabbits also suffer from the same parasite.

The range of the fly seems limited to the coast and no further inland than an elevation of 1,000 ft. It is common from the Tugela downwards, being particularly abundant about Verulam and Durban last season, and not so much so south of the Port.

There is a general opinion that more than one species exists which has this unfortunate habit, and whilst this is possible I am of opinion that, upon the whole, the trouble arises from the species named above. I am led to make this remark because a number of writers to the daily press insist that any large, brown fly is a dangerous one. Such an assertion at once detracts from the value of any statement such writers may make, as it shows too hasty judgment and a habit of jumping to large conclusions upon small evidence. I take it that the better course is to advise householders that (as the flies can only be determined with a certainty by a specialist, and then only after a minute inspection), the wiser plan is to destroy every large, brown fly found about the home, and particularly in the sleeping rooms.

The following is a general description of the true maggot fly, in popular words, but it is only fair to say that it will apply equally well to many species probably having nothing in common with the pests:—

Length, half an inch. Head large, eyes large and of a dark-brown colour, the face (or area between the eyes) of a light or even yellowish brown. The thorax or chest—the central division of the body carrying the wings and legs—of a greyish brown and sparsely clothed with spiny hairs. The abdomen is white beneath, and of a grey-brown colour above, except for the large light-coloured segment which is attached to the thorax. The wings are transparent, glassy, tinged with a smoky brown, and many veined, but not banded or spotted in any way. The mouth is not suited for piercing, but is spread out and of a sucker-like form, suited for taking up food in a liquid state. The female flies are not supplied with any needle-like ovipositor with which to pierce the flesh of a victim in order to deposit their eggs in the skin.

The eggs of the maggot fly, taken from the female's abdomen, are elongated and white, being about 3-50th inch in length. With regard to the depositing of eggs, and how the larvæ become encysted in the skin, I regret to say that I have no data supporting that explicit testimony which one requires before accepting individual views. In at least three directions it has been averred that the flies lay their eggs about the bedding, and the larvæ, which hatch from them, bore into the skin, one writer to the *Natal Mercury* stating that the maggots had been picked out 20 at a time, "while their bodies were vigorously flapping to and fro as they bored their way into the flesh." It is claimed that this usually happens when the victim is asleep—certainly none of my acquaintances have been able to satisfy themselves as to where and how they became infested. As to how long the maggots take to mature in the flesh I will quote from notes supplied to me by a fairly careful observer who submitted them to me as a matter of personal opinion open to amendation. "When camping out last March," ob-

served my informant, "I noticed a maggot fly in the tent on the Tuesday of one week, and on the following Saturday suffered from an itching in the arm and chest. On Monday the spots had taken the form of blind-boils, with a black speck in the centre of each. A week later maggots measuring one-third of an inch were expressed from the 'boils.' The fly observed was caught, and living maggots excluded from the abdomen when squeezed."

Full-grown maggots from which adults have been reared by placing them in sand are of a white or dirty whitish colour and much besprinkled with minute black spots which, as a matter of fact, are really spines. They measure about ½ an inch in length, and at least one moulted skin has been excluded from a "boil" with a maggot.

The pupa resembles that of any ordinary fly of the size of this, being stout and oval in outline. It is of a dark purple colour and, as a rule, covered with a mealy coat.

The "boils" or swellings caused by the presence of the maggots in the skin are naturally a source of discomfort, but in the majority of cases little pain seems to accrue from them. I have, however, met individuals to whom the attack had proved most painful. After the maggots have been excluded from the skin the affected part usually heals rapidly, especially if the hole is treated with a little antiseptic. The scar, however, remains quite a conspicuous mark for months, but whether it is permanent I cannot as yet say.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of November, 1901 :—

Name of Colliery.	Labour Employed. Above Ground. E.	N.	I.	Below Ground E.	N.	I.	Coal raised. tons.	cwt.
Natal Navigation	15	30	177	13	170	198	11,193	13
Dundee Coal Coy.	14	20	108	17	164	337	10,575	9
Elands Laagte	11	20	160	11	130	280	9,406	0
St. George's	11	80	47	6	139	17	4,219	0
Crown	6	58	3	4	129	1	2,208	0
*Natal Marine	7	137	2	20	166	23	2,076	19
†No. 42	9	27	9	3	93	0	1,855	0
Newcastle	4	17	11	3	117	0	1,620	8
Dudley	5	17	4	2	41	1	832	0
Natal Steam Coal	5	31	7	1	37	1	685	6
Inkunzi	2	10	0	1	46	0	585	0
West Lennoxton	2	4	9	1	11	27	573	13
Central	11	36	1	3	60	2	540	19
Hillside Colliery			No return.					
Total	102	487	538	85	1,303	887	46,371	7
Corresponding month, 1900 ...	88	471	359	54	1,600	546	36,997	18

*13 Europeans 138 natives, 23 Indians employed at non-productive work.
†The output for October was 1,969 tons 5 cwt. and not 2,055 tons 6 cwt. as shown in Return dated 7th November.

Mines Office,
December 9th, 1901.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of November, 1901 :—

	tons.	cwt.
*Coal Bunkered	23,874	2
Coal exported to Cape Colony	3,450	16
" Beira	142	3
" Chinde	39	14
Total	27,506	15

*Included in this is Imported Coal, viz., 324 tons 7 cwt.

GEO. MAYSTON,
Collector of Customs.

Custom House, Port Natal.

The Banana.

THE above represents a banana plant at the stage of developing fruit. The photograph was taken at Mr. Vincent Symmon's fruit farm, Malvern. Although the farm is much sheltered from winds naturally and artifically, this was the best specimen that could be found. The leaves of the plant, for beauty's sake, are unfortunately most easily tearable. For practical information as to cultivation, see No. 3, Vol. IV., etc. The following scientific description is taken from the *Encyclopædia Britanniça.* BANANA (*Musa sapientum*) a gigantic herbaceous plant belonging to the natural order *Musaceæ*, originally a native of the tropical parts of the East, but now cultivated in all tropical and sub-tropical climates. It forms a spurious kind of stem, rising 15 or 20 feet by the sheathing bases of the leaves, the blades of which sometimes measure as much as ten feet in length by two feet across. The stem bears several clusters of fruit, which somewhat resemble cucumbers in size and form ; it dies down after maturing the fruit. The weight of the produce of a single cluster is sometimes as much as 80lb., and it was calcu-

lated by Humbolt that the productiveness of the banana as compared with wheat is as 133 to 1, and as against potatoes 44 to 1. The varieties of the banana cultivated in the tropics are as numerous as the varieties of apples in temperate regions, and the best authorities now agree that no specific difference exists between it and the plantain. The fruit is extensively used as food ; and in many of the Pacific islands it is the staple on which the natives depend. In its mature condition it contains much starch, which on ripening changes into sugar, and as a ripe fruit it has a sweet but somewhat flavourless taste. From the unripe fruit dried in the sun, a useful and nutritious flour is prepared. The following represents the percentage composition of the pulp of the ripe fruit : nitrogenous matter, 4·820 ; sugar, pectin, etc , 19·657 ; fatty matter, 0·632 ; cellulose, 0·200 ; saline matter, 0·791 ; water, 73·900.

Co-operation.

CREAMERIES IN IRELAND.

THE following is extracted from the Farm column in the "Manchester Examiner" :—

The progress of agricultural organisation in Ireland is surprising. At the end of last year there were no fewer than 477 societies, with a membership of 46,000, or nearly 100 per society. These included 236 creameries, with 26,000 members, representing in this one branch alone a paid-up share capital of £74,000, buildings and plant worth £129,000, and butter sales of more than £700,000. There are also 106 agricultural societies which did a business in the year of £74,000, 21 poultry societies which traded to the extent of nearly £9,500, 76 agricultural banks, to the members of which over £7,000 was lent, and 38 other societies with a trade of £221,000. The income of the Irish Agricultural Organisation Society for the year ending December appears to be about £4,440, of which £1,930 was absorbed in salaries, £1,500 in subsistence allowance to officers travelling, and the balance to rent, printing, postage, and incidentals. Dealing first with the dairy societies, it may be mentioned that in 1899 29¾ million gallons of milk were supplied, one creamery — that of Lombardstown, in Cork — dealing with 656,000 gallons. A number of others came close upon it, and the butter produced was just below 12 million pounds, the average produce per gallon of milk being 6 62 oz. ; so that one pound of butter was produced per 2·4 gallons of milk. The average price paid per gallon was 3·9d., and the average price for butter 10·9d., the cost of producing each pound of butter working out at 1·47d. And here a remark may be made showing the difference in the cost of production in the different creameries. In one creamery the cost per lb. was 3·37d. —no doubt owing to the small quantity of butter produced during only a portion of the year. The lowest cost was in one of the largest creameries, where over half a million gallons of milk was handled. Here the cost was 0·73 d., or less than ¾d. a pound. Curiously, however, the creamery dealing with the largest quantity of milk manufactured at a higher rate— 1·12d. per pound. We now come to the last year, for the report includes practically two years. In 1900 171 creameries handled 35½ million gallons of milk and produced 13½ million pounds of butter, one gallon producing on the average 6·59 oz. ; in other words, 1 lb. of butter was produced from 2·42 gallons of milk. The average price paid for the milk was 3·84d. per gallon, and for the butter 10·84d. per pound. The highest charge for producing a pound of butter upon the average (although figures are not provided in all cases) was 2·83d. to the pound, while the lowest was 0·61d. Again, the quantity of milk handled does not appear to govern the cost of production, for the cheapest work was done with 120,000 gallons, whereas much larger quantities of milk were handled by creameries where the cost was much higher, so that there is

probably some reason unaccounted for which explains the difficulty. In one case 550,000 gallons of milk were handled, and yet the cost of producing a pound of butter reached 1·85d. I am bound to say that the general work is exceptionally good, for in no single instance in which figures are given was the butter ratio large. The details supplied in the myriad of figures which the report contains are of enormous value to those who study the co-operative system. Let us, however, look at a few additional facts. From 1892 to 1898 butter systematically fell in price; in the previous year it reached 11·55d. per pound; in the latter year 9·83d: but in 1899, although the number of creameries rose from 100 to 160, the price of the butter rose to 10·92d., falling last year to 10·84d. Again, the quantity of butter made from each gallon of milk, 6·26 oz. in 1892, was increased, with one exception, year by year until 1899, falling a fraction in 1900, when it was 6·59 oz.; so that those responsible have now the satisfaction of knowing that by skilled work they have increased the butter yield of the milk and at the same time practically maintained the price. There have, however, been greater fluctuations in the price paid for the milk, which in 1892 was apparently 4d., falling to 3½d., in round figures, from 1894 to 1898, and rising from 1899 to 1900 to 3 84d. The net profits realised last year was £12,000 —an enormous advance upon any previous year.

We may take it, then, that the creamery system in Ireland is established as a great success, and that it is now but a matter of time for the whole country to be covered, except so far as private creameries—which are very numerous—are concerned. The agricultural societies are also doing work, although in one case a serious loss has been sustained. The largest society is at Enniscorthy, and here there are 732 members, the year's trade reaching £17,500. As the Minister for Agriculture has told us, the farmers want cohesion, and it may be many years before this system becomes general in England, where it is much needed. Not only does combination enable the farmer to buy good material, seed, food, stock, manure, coals, implements, and the like, but in every case he obtains what he needs at a much lower cost; and this is a still more serious item in Ireland than in England, inasmuch as in the small country towns the dealers buy almost from hand to mouth, and in the past have sold at a prodigious advance upon cost price. The large English buyer is able to purchase his 100 tons with advantage to himself. But large tenants are in the minority; it is the smaller tenants in whose interest co-operation should advance, and the society of which Mr. Yerburgh is president is ready to come to the rescue.

Bots in Horses.

REMEDIES for bots in horses are regarded with suspicion, owing to so many having proved worthless. From the way the bot obtains its sustenance from the inner lining of the horse's stomach, it is almost impossible to give the animal any dose that will be taken by the parasite. The following "cure for bots" is taken from the journal of the Jamaica Agricultural Society:— The United States Department of Agriculture publishes a simple cure for bots in horses. An experimenter tried a few tests upon a quantity of live bots taken from a horse which the bots had killed. When put into sage tea they died in 15 hours; but as that was too slow a process, he tried them in nitric acid; but it seemed to trouble them no more than water. He then bruised some tansy, and made an infusion of the juice, and put some of the bots in it. They were dead in a minute. As he had a horse suspected of being troubled with bots, he gave him some tansy tea in the morning, and a dose of salts in the evening. The next morning the horse's excrement contained 1½ pints of bots, and the cure, after repeated trials, is now said to be recognised as thoroughly effective.

The late Lord Glasgow spent thousands in endeavouring to breed first-class race-horses If he did not succeed in producing any whose names live in Turf history, he deserves immortality for his drastic method of getting rid of bad thoroughbreds. He never sold a horse; he used to have a regular shooting day after trying his two-year-olds, and those found not good enough to train were destroyed out of hand.

Gleanings.

Pirate Chief a son of Buccaneer, had his career spoiled by a curious accident. His lad left him in his box on a single rack-chain while he went to fetch something, and omitted to put up the stirrup irons. The horse turned to bite at a fly or something, and got the side of the near iron fixed between his teeth, and, struggling to get free, broke the rack chain, reared up, fell over, and ricked his back. He never fully recovered from the effects of the fall.

Denmark, the great butter-making country of the world, bought last year 35,000,000 pounds of oleo oil from the United States. Last year England bought nearly £8,000,000 worth of butter from Denmark, but the frugal Dane spreads oleo on his own bread. Oleo costs him 15 cents. a pound, while England pays 40 cents. a pound for his best butter. It will be seen that the Dane does not pay butter prices for his oleo.

Treacle, like all sugary compounds, is very fattening, and the experience of many feeders (says the "Agricultural World") confirms the opinion that, when used with discretion, it is capable of being very advantageously employed in the fattening of farm stock. It is, of course, best adapted for use when the animals are being house-fed, and the most effective plan of giving it is to dilute it with hot water, and pour it over the chaffed fodder which the animals are receiving. In the use of treacle—as, indeed, in the use of all foods—moderation must be exercised at the commencement, and only a small quantity given. A pound per head per day is quite enough for a beginning, but when the systems of the animals become accustomed to it—for, as is well known, it is very laxative in its effects—as much as 3 lb. per day may be given with advantage to full-sized cattle.

Mr. N. W. Stirling, the secretary of the Pastoralists' Association of South Australia and West Darling, who is now serving as remount officer, with the rank of lieutenant, in De Lisle's South Australians, in the Wynberg district of South Africa, writes as follows:—"I have never seen such a big area of good grazing country anywhere before. I put the bulk of it at the worst at two acres to a sheep. Down this end the homesteads are very good indeed—good, substantial houses, good gardens, good dams, and first-class fences. There is a lot of twaddle talked about the Boers being behind the times, for in many cases they are far ahead of us. All the improvements they have made are really first-class. The cattle are small but good sorts, I should say something more like Devons than anything else we have. They are very even for size and colour (red or black). The sheep are mean, but it must be considered no serious attempt has ever been made to improve them. Horses, so so. Of course, one difficulty is how soon a man will be able to settle on the land. I should say not for two years, at any rate."

The London market for frozen mutton has further advanced. Australian mutton is ¼d dearer, at 3¼d., a price that compares with 2d. to 2⅛d. at the beginning of June, when the market was at its worst. River Plate mutton has advanced 5-16d., and is now quoted at 3¼d.

The English wheat crop is estimated at 54,250,000 bushels, or more than the production of the Australian Commonwealth and New Zealand combined. Yet we are given to regard the English agriculturist as much behind the times. He gets an average yield of 28 to 34 bushels per acre. We are pleased with 12 bushels.—"Pastoralists' Review."

The virtues of that old-fashioned and easily-procured drink, buttermilk, have not been half sung these days. Physicians say that its lactic acid is even more healthful than the citric acid of oranges and lemons. It is credited, too, by those who should know, as being of value to a rheumatic patient. It has been found to be both nourishing and fattening, as well as remarkably easy of assimilation. If liked at all, it is undoubtedly a better drink in summer than many of the carbonated, artificially-flavoured drinks that are consumed in almost unlimited quantities.

A Chicago harvester company has secured a track of 54,000 acres of hardwood timber, from which it will attempt to raise the timber used in the manufacture of its implements. It is the first instance of an American manufacturing concern to employ modern forest methods in raising timber for its own use. A plan is being perfected for the intelligent and economical working of this track, which will include the removing of less valuable species. The merchantable timber will also be cut without injury to the growth of the forest. The track consists chiefly of oak, ash, and hickory, which are the woods chiefly used in the manufacture of agricultural implements.

Thus Mr. Roosevelt, now President of the United States, described his favourite shooting pony in "Hunting Trips of a Ranchman": "Stoutly built and strong, able to carry a good-sized buck behind his rider for miles, without minding it in the least; he is very enduring and very hardy, not only picking up a living, but even growing fat when left to shift for himself under very hard conditions; he is perfectly surefooted, and as fast as any horse on the river. Though both willing and spirited, he is very gentle, and will stay grazing in one spot, when left, and will permit himself to be caught without difficulty. Add to these virtues the fact that he will let any dead beast or thing be packed on him, and will allow a man to shoot offhis back or right by him without moving, and it is evident he is nearly perfect as hunting horseflesh can be."

The Ringing of Plants.

IN a recent number of "American Gardening" some experiments in ringing grape vines, carried out at the New York Agricultural Experiment Station, are recorded. Two vineyards in different parts of the State were treated, and the vines in each were ringed for two years. In one vineyard, trained upon the two-arm Kniffin system, both arms were ringed beyond the fifth bud, and in the other vineyard, using the renewal system of training, the arms were ringed beyond the renewal bud. In both vineyards very marked differences in favour of the fruit on ringed arms was noticed with certain varieties, the bunches and berries being longer and more compact and ripening earlier. In most cases, however, the quality was injured, and the grapes, which naturally show a tendency to crack, were worse in this respect than those produced by unringed vines.

The process of ringing consists in the removal of a ring of bark sufficiently deep to prevent reunion of the two separated portions during that season of growth. This ring of removed tissue consists of both the outer and inner bark, leaving the wood cylinder fully exposed. The operation is properly performed at the season of the greatest activity of growth in the cambium layer. The physiological effect of this is a violent interruption of the normal processes of circulation of the plant sap. The upward passage of fluids, while slightly affected, is practically maintained as in the ordinary shoot. The downward passage of elaborated food from the leaves is, on the other hand, considerably impeded, the result being that the upper end of the shoot, or that portion which is beyond the ring, becomes gorged with the elaborated food, and an unnatural aging or maturity of that portion of the plant is brought about. Shoots treated thus will develop ripe fruit at an earlier date than the rest of the tree, and further the aging process, which manifests itself in the beautiful autumn tints, is more or less advanced. The upper portion of the shoot also shows a somewhat stunted growth, and become short-jointed. A strangulation by a ligature would accomplish the same end, the essential fact being the interruption of the downward flow of the sap.

The process of ringing or decortication has been tried on vegetables—the tomato, egg fruit, etc. Tomatoes are largely increased in size at the expense of flavour; egg fruits from ringed plants are as heavy again as those from ordinary plants. Possibly monster pumpkins may become still more monstrous by the shoots being ringed, and so may other vegetables and fruits where quality is of less importance than mere size. Each grower should decide for himself as to whether ringing is a profitable or advisable practice to pursue.

Lucerne Growing.

IT is difficult to understand, says "Bruni" in the "Australasian," why lucerne is not more extensively grown in Victoria, or, indeed, Australia generally, than is the case at present. In districts where a supply of water is available for irrigation it is questionable if any known fodder plant can produce as good returns over a period of years, though some of them may beat it for one year. Notwithstanding an enormous writing-off of principal and remission of interest on loans contracted for water supply purposes, the Rodney Irrigation Trust now owes the State a large sum for interest, yet its territory is probably the best reticulated in Victoria, and fully three-fourths of the land is suitable for the growth of lucerne. If the landholders would only give to this noble fodder plant the attention which it deserves, there would be absolutely no difficulty experienced in meeting their obligations to the State, and, at the same time, securing very substantial profits for

themselves. There is a good deal of lucerne grown in the County of Rodney, and though the majority of the fields are not treated properly, nevertheless they pay handsomely, and largely increase the stock-carrying capability of the land as compared with what was possible under natural pasture. All who have tried lucerne are loud in their praises of it, and the marvel is that they themselves do not grow more of it, and that their example is not extensively copied by their neighbours. With regard to the American appreciation of the value of lucerne as a stock fodder, the following remarks from Mr. F. D. Coburn, secretary of the Kansas State Department of Agriculture, are worth quoting:—"The wonderful performances this year of this widely-exploited plant have attracted attention anew to its worth, it having yielded two, three, or four cuttings, and the stockman who was possessed of even a small acreage is in an enviable situation. The intelligent Kansas farmers, whose State far and away leads all others in alfalfa production, are constantly bettering their condition and chances for success by devoting larger areas to its culture, as is conspicuously indicated in official statistics compiled by the State Board of Agriculture. For instance, the first official notice was taken of alfalfa by the Board in 1891, when the total returned was 34,384 acres; this year its field extends over 319,000 acres, showing the phenomenal increase in the ten years of over 828 per cent. This increase is strikingly suggestive of the rapidity and extent to which merit alone has forced recognition of a very wonderful field crop. This year's figures proclaim an increase for the State of 43,134 acres, or more than 15 per cent. over one year ago. All portions of the State display remarkable and increasing interest in alfalfa growing, as is demonstrated by the large gain. Alfalfa seems to flourish in well-nigh all sections of the State, and after once gaining a firm roothold can be safely relied upon to produce from two to four cuttings whether the season be wet or dry. Preparations are going on for seeding additional lands to this remarkable plant, and in the light of all experience it appears a most judicious thing to do."

Points about Bonedust.

"BRUNI," in the "Australasian," remarks:—A very large quantity of artificial manures will be required in the cereal-growing districts this season, and farmers will act wisely in placing their orders as early as possible, so as to make certain of obtaining what they need. In order to receive full benefit from the reduction in railway rates, it is also desirable that farmers in the same locality should club together and order a considerable quantity of manure at one time, and provide for local storage until the material is required for use. Some manures improve by being kept two or three months after being obtained from the factory, and bonedust, which is largely used in connection with grain growing, is one of these, and this points to the desirability of laying in a supply before the actual time for applying it to the field has arrived. The value of bonedust as a manure, assuming it to be pure, depends upon its solubility. In this connection, experiments conducted by Voelcker many years ago, are instructive and reliable. He found that different kinds of bone varied much in their solubility and practical efficiency as manures, and his experience has led him to the following conclusions:—1. Bonedust made from solid bones, even when reduced to a fine powder, is less soluble in water, and acts more slowly on vegetation than much coarser bonedust made from porus or spongy bones. 2. Fresh bones impregnated with grease do not readily enter into decomposition, and are less valuable as a manure than bones from which most of the fat has been removed by boiling in an open copper. 3. Fat or bone grease has no fertilising value whatever, and, as it retards the solution of bonedust in water, it is decidedly an objectionable constituent of fresh bones as far as the agriculturist is concerned. 4. Water dissolves much

more phosphates of lime from rotten than from fresh bones. 5. During the putrefaction of bones soluble nitrogenous organic compounds and ammoniacal salts are produced from the gelatine contained in the bones. These compounds act powerfully and quickly as fetilising constituents, and are indirectly useful in greatly enhancing the solubility of bone phosphates in water. 6. Bonedust kept in a heap for three or four months heats and becomes more efficacious as a manure than bonedust applied to the land fresh from the mill. 7. High-pressure steam renders bones so brittle that they can be easily ground into a fine powder, which is readily assimilated by plants. 8. Bone-meal prepared by high-pressure steam contains not much less nitrogen than ordinary bonedust, and, as a manure, is far more efficacious and valuable than the latter. 9. Placed in a heap, with ashes or sand, and occasionally moistened with liquid manure or water, bone enters into putrefaction, and becomes a much more soluble and energetic manure than ordinary bonedust.

Garden Notes for December.

By W. J. Bell, Florist and Seedsman.

KITCHEN GARDEN,—The main crop of cauliflower should be sown without delay, especially the late growing varieties, such as Autumn Giant. This variety requires six or seven months at least to mature from the time the seed is sown, and in some localities they have been known to take several months longer. Another sowing of celery may still be made where the first sowings have failed, though it is now getting too late for sowing this crop, expect for soups, unless a very sheltered spot can be found for sowing in the open. Sowing in boxes is preferable, as they can be moved about as required, but should not be placed under the drip of trees.

Succession sowing should be made of French Beans, Beet, Cabbage, Carrot, Lettuce, Radish, Mustard and Cress, Leek, Parsley.

Early varieties of Tomato and Bush Marrow may still be sown except in the colder districts.

Peas seldom do much good at this time of the year unless they are well staked with rough twiggy sticks.

Thin out the growing crops of beet, radish, carrots, lettuce, etc., as required. The thinnings of lettuce may be transplanted into another bed about nine inches apart, and will make good plants to follow after those left in the seed bed. Some of the larger varieties of lettuce should be planted not less than one foot apart, and Webb's Wonderful—one of the largest in cultivation—requires to be planted not less than eighteen inches or two feet apart.

Beds of beet, radish, turnip and carrot are frequently spoiled by want of thinning out, and, to facilitate this operation, sowing in drills is the most convenient.

Keep all crops free from weeds by constant hoeing, and give copious supplies of water in dry weather. When frequent watering is required, mulching with littery manure will be found a great benefit, as it prevents too rapid evaporation, and baking and hardening of the surface of the ground, to which some soils are very liable when water is constantly applied in hot weather.

No seeds should be sown at this time of the year unless they are well shaded immediately afterwards with some kind of light material such as straw, grass, or hay. If fresh cut grass is used it should be free from seed if possible.

Flower Garden.—Many varieties of tender and half-hardy annuals may be now sown for autumn flowering, including Asters, Balsams, Calandrinia, Centaurea Margarita, Centaurea Americana, Cosmos, Chrysanthemum tricolor, Gaillardia Helianthus, Helichrysum, Marigold, Nasturtium, Phlox, and Zinnia.

Carnation seed may also be sown now for spring flowering.

Dahlias should be well staked, and should be freely supplied with water in dry weather, but should first be mulched with old manure.

Phlox decussata will now be near blooming, and should never be allowed to suffer from drought if fine heads of bloom are required. In hard dry soils these should be planted in trenches like celery with plenty of manure underneath, or if in borders where trenches cannot be made, plant each clump in a sort of basin, that is, lower than the surrounding surface, and mulch with old rotten manure up to the general level. Any water applied will then soak in to the roots, and will not spread out and be lost as it would if they were planted level with the surface.

All kinds of evergreen flowering shrubs and fence plants may be planted this month, also evergreen fruit trees such as the Orange, Naartje, Lemon, Lime, Guava, Mango, etc.

The budding of roses and fruit trees may be commenced, also layering.

Carnations may be layered now for flowering in the autumn and winter where frost is not severe. For spring flowering they may be layered about February and March.

In the operation of budding, the buds should be well-formed eyes in the axil of the leaf. Having fixed on the intended stock and bud, take a sharp budding knife and with a clean cut take the bud from the branch with about a quarter of an inch of the bark above and below; remove the small portion of wood left without injuring the eye, as if this comes away with the wood it will be useless.

If budding with the wood is done the wood left inside of the eye should be very thin, so that it will shape itself easily to the stock.

Beginners and those who are not expert should bud with the wood, as the shield is more solid and not so easily bruised. After the eye is ready, choose a suitable place in the stem of the stock and cut a T shaped cut through the bark. Open this with the handle of the budding knife and set the shield under it.

Afterwards bandage over above and below with raffia, bringing the lips of the bark of the stock together again over the bark of the bud, taking care that the base of the eye is in actual contact with the bark of the stock.

A Branding Mixture.

WE have had, says the "Breeders' Gazette," several complaints that druggists are in doubt as to compounding the formula for the New Zealand chemical branding mixture. The directions, as we printed them, are as follows :—

Barium sulphite and coal tar, thinned by equal parts of American potash and water and spirits of turpentine, each equal in measure to the original composition.

We found no difficulty in understanding these directions, but for the benefit of those who are puzzled we put them in the form of a prescription with full directions as follows :—

Barium sulphite	...	16 ounces
Coal tar ...	...	16 „
Mix thin with		
American potash	...	32 „
Turpentine	...	32 „
Water ...	...	32 „

Mix the barium sulphite and coal tar thoroughly as is required by the nature of the two substances. Mix the three last-named—potash, turpentine, and water—also as required by their natures so as to secure perfect fluidity and amalgamation. Gradually then incorporate the two masses.

A correspondent reports that he has had good success by clipping the hair from the point at which he wishes to apply the brand, but from the experience of others this is not necessary. The same correspondent states that a wooden brand will answer quite as well as one of iron.

An odd compliment was paid a naval officer who accompanied Sir John Malcolm's Mission to Teheran by a Persian trader. The officer was a very poor horseman, and, being mounted on a rather spirited Arab, afforded the onlookers a good deal of amusement by his frantic endeavours to keep his seat in the saddle. The trader sought to console him, saying that he had told all his friends, "You, like all English, good rider, but this one time they see you you very drunk." It was, he thought, a serious shortcoming in a white man to be unable to ride, but none whatever to be very drunk in public on a ceremonial occasion.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of November, 1901.

STATIONS	TEMPERATURE (In Fahr. Degrees).				RAINFALL (in inches).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1901.	Total for same per'd from July 1st, 1900.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	80·3	63·7	98·8	55·6	8·17	24	1·65	19th	21·63	12·81
Stanger...	83·2	59·1	112·0	51·0	5·80	24	1·60	18th	15·87	12·45
Verulam	84·3	64·1	110·0	40·0	4·83	18	1·01	8th	15·70	11·77
Newcastle	90·0	59·7	93·0	56·0	5·10	13	2·17	23rd	14·11	7·0
Estcourt	83·3	55·4	95·0	48·0	4·39	13	1·19	24th	10·06	6·63
Port Shepstone .	79·0	62·5	95·0	55·0	9·95	18	1·85	24th	26·34	11·95
Umzinto	80·4	55·0	98·0	53·0	7·32	18	1·55	4th	16·22	11·69
Richmond	73·6	55·5	99·0	46·0	6·07	22	1·42	5th	15·30	...
Maritzburg	80·1	57·1	102·0	49·0	4·28	20	·70	29th	11·38	7·31
Howick	78·6	53·8	95·0	40·0	3·90	22	·57	30th	12·20	3·19
Dundee	85·4	52·2	9 .0	50·0	4·78	13	1·75	29th	15·18	..
Weenen	87·9	57·2	101·0	49·0	4·34	13	1·44	23rd	9·61	6·08
New Hanover ...	82·8	57·5	100·0	51·0	3·97	18	·83	29th	14·58	7·8
Hillcrest	72·7	58·5	99·0	53·0	5·48	23	1·08	6th	16·02	...
Mapumulo	82·3	59·0	102·0	53·0	6·07	18	1·16	19th	18·37	10·62
Nongoma	76·3	58·7	92·0	54·0	4·12	6	1·05	11th	12·62	10·09
N'Kandhla	73·4	56·9	92·0	50·0	2·74	13	·65	24th	...	...
Qudeni	70·2	50·0	86·0	43·0	4·62	23	1·76	24th	21·59	...
Umlalazi	86·3	71·1	112·0	57·0	4·33	17	1·20	29th	...	...
Hlabisa	78·3	61·0	97·0	55·0	3·85	9	1·10	11th	15·95	...
Melmoth	80·4	59·0	101·0	54·0	3·76	17	·84	24th	12·67	9·84
Eshowe	78·3	60·7	101·0	55·0	5·11	19	·90	30th	20·60	16·30
Point	...		...	..	3·89	17	·71	29th	14·15	10·97
Lower Tugela... ...	83·5	65·1	104·0	58·0	3·24	30	·75	24th	...	...
Nqutu	77·1	55·3	89·0	46·0	2·70	13	1·10	24th	...	...
South Coast Junction	...	...	.	...	7·05	26	1·42	18th	21·84	...

OTHER STATIONS.

Estcourt	...	...	97	44	4·96	13	1·30	23rd	11·05	6·94
Nottingham Road ..	...	...	..	...	5·20	18	1·42	19th	16·24	8·86
Adamshurst		...	91	50	4·09	20	·66	6th	11·27	...
Hilton	...	...	94	47	5·29	20	·71	29th	14·80	8·29
Ixopo (Gerton) ...	...	...	92	58	4·60	15	1·00	30th	8·29	5·16
Mid Illovo (Ismont)...	..	..	92	51	7·48	20	1·11	6th	19·73	9·80
Ottawa	...	...	...	...	4·68	17	1·01	9th	15·59	11·49
Mount Edgecombe ...	...	...	103	61	5·86	18	1·10	10th	18·38	12·17
Cornubia	...		...	...	6·78	...	...	...	20·00	14·12
Milkwood Kraal ...	...	...	...	...	5·20	...	.	...	14·27	8·14
Blackburn	...	...	..	...	6·67	...	...	...	17·71	12·01
Saccharine	...	...	...	...	5·50	...	...	...	17·40	12·49
Prospect Hall... ...	...	...	...	...	5·97	...	...	...	17·70	...
Clairmont	...	...	...	...	8·50	...	...		22·60	11·06
Equeefa	...	...	101	59	7·82	21	1·10	24th	19·66	11·08
Umzinto (Beneva) ...	...	...	..	...	9·02	21	1·35	23rd	20·71	11·26

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		"	F. R. Moor ...	Greystone.
		"	F. Knapp ...	Klipfontein.
		"	J. W. Moor ...	Moorleigh.
		"	J. Oates ...	Oatsvale.
		"	R. C. O'Neil ...	Hillgrove.
		"	C. J. Labuscagne...	Haatsfontein.
		"	B. J. Wilkes ...	Portington.
		"	A. G. Harding ...	Marshlands.
		"	Du Plessis & Cloete	Compensation.
		"	J. Van der Merwe	Welgekoose.
		"	A. Pretorius ..	Shypoort.
		"	C. W. Dennill. ...	Guadaloupe.
		"	S. Nel ...	Wagon Drift.
J. Button	Estcourt, South of Bushman's River	"	C. B. Lloyd ...	Hidcote.
		,	Geo. Gibson ...	Craignevin.
		"	L. Schomann ...	Twyfelfontein.
		"	S. Schomann ...	Willow Grange.
		"	W. McFie ...	Highlands.
		"	J. K. H. Miller ...	Beacon Hill.
		"	H. E. Kirby ...	Klipfontein.
		"	J. Marais ...	Malan Spruit
		"	A. Lawrence ...	Grantleigh.
		"	L. Berthon ...	Littlecote.
		"	J. Chadwick ..	Howard.
		"	C. J. Smythe ...	Stratherne.
A. H. Ball	Weenen ...	,	W. Lotter ...	Doornkloof.
		"	P Van Rooyen ...	Middleburg.
		"	C. P. F. Van Rooyen	Mona.
		"	P. M. Lotter ...	Waterfall.
		"	S. C. Van Rooyen	Middleberg.
		"	A. Hair	Oribee Vlakte
		Lungsickness	Maboko	Bushman's River Poort.
J. J. Hodson ..	Lion's River ...	Scab	W. T. Shaw ...	Shawswood.
		"	J. J. Morton ...	Sherwood.
		"	F. Curry ...	Weltevreden.
		"	Mrs. F. McKenzie	Onverwacht.
		"	W. L. Methley ...	Newstead.
		"	Jos. Raw	Buffels Bosch.
E. J. B. Hosking ...	Upper Umkomanzi	"	Wm. Watson ...	Minerva.
R. J. Raw	Impendhle ...	"	J. W. Brooke ...	Impendhle Store.
		"	A. C. Crosse ...	Dingley Dell.
		"	R. Gresham ...	Castle Howard.
		"	C. P. Speirs ...	Mount Park.
		"	R. Ogram ...	Tilletudleni.
		"	A. H. Lee ...	Inhluzani.
		"	F. Knapp ...	Furth.
		"	S. M. Shaw ...	Umgeni Poort.
		"	C. W. Roberts ...	Ebrington.
		"	A. W. Leggatt ...	Selbourne.
W. Wilson	Polela	"	J. Hayes ...	Glengariffe.
		"	H. Pennefather ...	Home Rule.
		"	R. C. Gold ...	Woodend.
		"	R. M. Arbuckle ...	Costmore.
		"	J. J. Van Dyke ...	Riverport.
		"	J. Van der Merwe	Nooitgedacht.
		"	S. Maritz ...	Maritzdale.
		"	F. E. Peto ...	Clovelly.

Stock Inspector.	District.	Disease.	Owner.	Farm.
W. Wilson	Polela	Scab	H. Nicholson ...	Fondling.
		,,	H. C. Gold ...	Dartford & Greenend.
		,,	J. Van Wykes ...	Epsom.
		,,	Caleni	Location.
		,,	J. Willson... ...	Stony Glen.
C. E. Hancock ...	Ixopo ...	,,	W Gray ...	Helmsley.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	Pietermaritzburg Corporation ...	Sanitary Depôt.
		,,	J. Townsend ...	146, West Street, Pietermaritzburg.
		,,	T. Owen ...	9, Pietermaritz St.
		,,	P. H. McCrystal...	11, ,,
		,,	F. Knapp	,,
		,,	Kamana	Sand Pits, Town Hill
		,,	H. H. Boden ...	The Knoll, Hilton Rd
J. A. Morrison ...	Durban & Umlazi	,,	Muti ...	Infuni M.S.
		,,	P. Saville ...	Umzimbazi.
		,,	W. Pearce ...	Lower Illovo.
W. A. Hutchinson	Alfred ...	Scab	Nqubu ...	Location.
		,,	Makubana ...	Amaci Location.
		,,	J. Wessels ...	Sheepwalk.
		,,	Geletu Flentyi ...	Location
		,,	Inkubi and Duli ...	Location
		,,	C. J. Triegaart ...	The May.
		,,	Umhlenga	Mount Nebo.
		Lungsickness	T. Groom, H. Clark, W. Simpson, P.W. Dept.	Ingeli Poort.
			G. Blakeway	Ingeli Poort.
			F. Mainwearing	Ingeli Poort.
W. Gray ...	Upper Tugela, S of Tugela River & Estcourt, N. of Bushman's River	,,	F. E. Zunckel ...	Rivulet.
		,,	J. Lawford ...	Emmadale.
		,,	Natives	Hongerspoort.
		,,	Wm. Zunckel and Umliezana	Wilhelmus Hohé
E. Varty ...	Umvoti, Western Portion	Scab	J. M Van Rooyen	Pompoennek.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	— Thompson ...	Marburg.
		,,	W. Clothier ...	Ultima Thule.
		,,	C. Mahai	Marburg.
		,,	C. Kaupar ...	,,
		,,	J. Malichi... ...	,,
		,,	H. Mason	Oakhurst.
A. S. Parkinson ...	New Hanover ...	Scab	Umshola & Makenke	Swaimana's Location

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

Rinderpest at present exists amongst natives' cattle on farms Doornboek, Kirkintulloch, and Dipping Station, Van Reenen's Pass, and amongst cattle of Pepworth & Reid, on farm Rietfontein, in the Ladysmith Division, and on farms Schoonspruit and Zandspruit, in the Upper Tugela Division north of the Tugela River, and at Normandien in the Newcastle Division.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 18th December, 1901.

Pine Cultivation.

THE following is a Report made by H. H. Cousins, M.A., F.C.S., to the Board (Jamaica) of Agriculture :—

The broad scale cultivation of Pines appears to present so many pitfalls and difficulties, and the interests are of such importance to Jamaica at the present moment, that I have thought it desirable to make a special study of this cultivation, and have visited every important pinery to which I could obtain access.

The outcome of these observations has been a conviction that a prospective grower would do well to make a thorough tour of inspection before embarking on so hazardous an enterprise as a pine cultivation, unsupported by wide knowledge and experience of local conditions.

There are to be seen pines, representing thousands of pounds in money, which plainly demonstrate almost every fundamental error in pine cultivation. I have myself seen demonstrated, literally by the acre, the following pitfalls in the growing of pines under our local conditions.

(1) Defective Drainage.—While it is a truism to assert that drainage is the most neglected feature of Jamaica agriculture, it is an axiom of pine cultivation that perfectly drained soil is absolutely assential to the health and vigour of the plant. I have yet to see pines overdrained in Jamaica. A striking demonstration of this fact is to be seen in St. Catherine. A piece of 8 acres was planted in pines. Four acres on the flat. Two acres with one foot trenches and raised beds. The flat-planted pines have actually died out except on a few isolated hillocks. The one foot trenches sufficed to save the plants, but the fruit was only modcrate. The two feet drainage resulted in success. Nothing could impress this lesson so well as a personal visit of inspection.

(2) Too Rich Soil.—Pines imported from Florida have been planted in soil containing 30 times the amount of plant food present in the Florida sands. In some cases rich pasture lands have been broken up, liberally manured with stable manure and finally top-dressed with the cotton seed meal, so much used by the Florida growers. Where the drainage had been attended to, the plants made phenomenal growth, and to an inexperienced eye promised the most gratifying results. Now that the fruiting stage has been reached and the enormous excess of nitrogen has exerted its effect, nine-tenths of the plants are monstrosities, "cockscombs," fruit with reduplicated crowns, or in some cases have produced a mass of axillary leaf shoots instead of fruiting. Acres of such pines are to be seen in St. Catherine.

Deeper trenches and a corrective in the shape of phosphatic fertilisers are being tried on plants about half grown which would otherwise give the same disappointing results. If some check can be given to this excessive vegetative stimulus, a fine crop of magnificent fruit should result.

(3) Danger of raw Organic Manure.—The pine is a "clean feeder," and readily injured by the injudicious use of manure. Partially decayed manure appears to poison the roots. Decaying tree-stumps have a similar effect. Pineries in which tree-stumps have been left in the soil from considerations of misjudged economy show stretches and patches of yellow, poisoned plants wherever the pines come in contact with the decaying roots in the soil. Clean cultivation and careful manuring are essential.

Improper Preparation and Planting of Suckers.—In the rush to get stock of the Cayenne and other popular sorts, many growers have planted many inferior suckers. Large cultivations are to be seen in a very unhealthy state owing to propagation of suckers infested with the pineapple scale at the roots. Such suckers should always be fumigated with Hydrocyanic acid (1 oz. 98 per cent. Cyanide, 2 ozs. water, 1½ ozs. Acid per 150 c. feet of space. Exposure one hour after sunset).

The growers from Florida, while responsible for the neglect of drainage and the evils of over-manuring, have at any rate taught us how to prepare and plant suckers. Most cultivations appear to have been well managed in this respect. A

tendency to plant suckers of too large a size which fruit prematurely should be guarded against.

Diseases.—I have noted the following enemies of the pine at work in this Island :

Mealy Bug.—This is well known. It attacks the fruit as well as the leaves. It causes spots in the fruit. Fumigation with Hydrocyanic Acid is to be tested on certain infected plantations.

Pineapple Scale.—This mainly attacks the roots and the stem beneath the surface of the soil. The leaves appear yellow and the plant has an unhealthy appearance. This seems to be due to injuries to the root-system by the attack of the scale. Suckers from infected plants should be fumigated before planting.

Blight. — This mysterious desease is only too well known by pine-growers. It seems worse where drainage is deficient. The American authorities claim to have found a fungus. The putrefactive rotting has been traced to a Bacterium in the Government Laboratory. Whatever the precise cause, the disease is contagious, and affected plants should be carefully removed and burnt. Plenty of lime should be applied to the spot and the soil left vacant for a year.

Puccinia Disease. — The Assistant Chemist is now studying a fungoid pest which is quite prevalent on pines in Jamaica. It appears to be a typical "puccinia" or rust fungus, and is undoubtedly a serious pest. The disease is still under observation and experiment.

Young Plants Susceptible to Fertilisers. —Placing a little fertiliser beneath each sucker has resulted in two instances in a very serious loss owing to the injurious effect produced. Care should be used in applying fertilisers to young plants. In Jamaica such help is rarely needed until the plants have made some appreciable growth.

Over Propagation.—The great demand for pine-suckers has put a premium on forced vegetative growth. The considerable number of unfruitful plants to be seen on some cultivations may probably be due to this cause. Experiments to test this and the general heredity of the pine-sucker are being started.

Conclusions.—Pines can be grown to perfection in Jamaica on a large scale. Hundreds of acres are available which only require attention to the natural requirements of the plant to secure certain and profitable results. Meanwhile, thousands of pounds are being wasted through lack of information and experience of local conditions. Success is certain, if the necessary care and attention is given to the essential conditions which the pine-apple demands for its healthy growth.

Orange River Irrigation.

A BIG SCHEME.

A COMPANY with a capital of a quarter of a million, it is stated, is being formed in London for the purpose of irrigating 136 square miles of land at Kheis, in Griqualand West, having a frontage of about 11 miles to the Orange River below its junction with the Vaal. The land is said to be capable of yielding abundant foodstuffs and cereals, and the company—the Orange River Irrigation Company—are determined upon carrying out the work on the most modern plan. A weir over 700 yards in length has already been constructed across the Orange River, and a canal has been dug for a length of two miles. A water race, 20 feet wide and 700 yards in length, has been constructed from the weir to feed turbines and pumps for lifting water into the service reservoir, from which a canal will be made to irrigation 6,000 acres. The pumps are capable of lifting six million gallons of water daily with a turbine to drive them. A site has been laid out as a township near the works, and it is anticipated that electric power will be generated by the turbine for driving threshing machines, grinding mills, saw mills, electric light and working stamps.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—Only a week from Christmas, and yet, so far as the usual conditions are concerned, it might be months away. One hears from almost every representative of trade the same complaint, viz., "owing to the N.G.R. failing to deliver goods, it is a moral impossibility to execute orders." The amount of profane language this state of affairs is answerable for, to say nothing of the disorganizing of business, is something astounding. A day or two back one merchant in Longmarket Street received a consignment of goods by ox-wagon, and the only way to save the situation, unless matters are altered, will be for some enterprising individuals to start transport riding. Very little rain has fallen this month, and farmers are complaining of the ravages made by grub.

Mealies.—On the market prices have fluctuated between 5s. 6d. and 6s. per 100 lbs.; and privately about the same prices have been offered and accepted.

Forage.—Almost every morning forage is now sold on the market at prices varying between 5s. and 8s. per 100 lbs; one lot of extra good quality realised 20s. per 100 lbs.

Hay.—Good samples have changed hands from 3s. to 4s. per 100 lbs.; bedding, from 5s. to 15s. and 21s. per load.

Green Barley.—From 11d. to 1s. 4d. per 100 lbs.

Potatoes.—Recently the market has been abundantly stocked, chiefly with Early Roses and good table samples have been sold at prices varying between 6s. 6d. and 11s. 9d. per 100 lbs., inferior samples from 2s. to 4s. per 100 lbs; Sweet potatoes from 2s. to 3s. 9d.

Mabele.—Prices have averaged about 8s. 3d. per 100 lbs.

Onions.—Market well supplied, and price. have varied between 6s. 3d. and 16s 6d per 100 lbs.

Pumpkins.—About 6s. 6d. per doz.

Beans.—Red, 6s. 6d. per 100 lbs.

Peas From 8s. to 22s. 6d. per 100 lbs.

Butter.—While some samples have only realised from 8d. to 9d. per lb., others have reached 1s. 5d., 1s. 8d., and 2s. 1d. per lb.

Eggs.—From 1s. to 2s. 10d. per doz.

Poultry.—Fowls (fit for table), from 4s. to 8s. each; chickens, from 1s. 10d to 3s. 4d. each; ducks, 6s. 3d. to 16s. 9d. per pair; turkeys, from 11s. 6d. to 32s. each; geese, 7s. 6d. to 9s. 6d. each; guinea fowls, 6s. 3d. per brace.

Sundries.—Mutton, from 7d. to 9d. per lb.; beef, 4½d. to 8d. per lb.; pork, from 3d. to 8½d. per lb.; bacon, from 6d. to 9d. per lb.; ham, from 11d. to 1s. 2d. per lb.; rabbits, from 1s. to 2s. 3d. each; fish, according to size.

Fruit.—Apples, apricots, bananas, grenadillas, lemons, limes, mangoes, oranges, strawberries, &c.

Vegetables.—Beans, beetroot, cabbages, cucumbers, carrots, lettuce, onions, peas, rhubarb, tomatoes, and turnips.

Wood.—From 9d. to 1s. 3½d. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44 writes:—

General.—Business is fairly brisk, but the manner in which it is hampered is sufficiently indicated by the recent loud complaints of up-country merchants regarding the extreme difficulty of procuring stocks by rail.

Mealies.—The market is dull, and with weevil forcing the hand of the speculators, farmers and others, any improvement must arise from extraneous causes. Local dealers are offering 12s. per muid.

Potatoes.—The new crop promises to be a very fine one, and parcels coming to market are superior to those of recent years. Rates have slumped enormously, and quotations on paper are practically illusory.

Forage.—Plenty is on offer at all prices, according to quality, and the quantity in the market shows clearly that rust is becoming a negligeable quantity.

Mabele is offered freely at 16s. 6d. per muid, and rates have dropped smartly in this line.

WOOL.

Mr. James Egner writes:—Prices were very firm at the last sales, 7⅛d. being the top price; this is the highest price since the opening. Ordinary skirted wools ruled from 6½d. to 6¾d.; unskirted from 5¾d. to 6⅛d. The market was fully a farthing stronger, which is accounted for by the fact that a ship of the Bucknall line was available, and freights in consequence were down to 5s. per bale. This matter I explained in my last. The London market closed steady for Merinos, whilst lower classes were 5 per cent. and cross-breds 10 per cent. lower.

In 1761 Mr. Jenison Shafto bet Mr. Hugo Meynell 2,000gs. that he would find a man who would ride a hundred miles a day for twenty-nine consecutive days on any number of horses not exceeding twenty-nine. Mr. John Woodcock was the person on whom Mr. Shafto's choice fell, and he began his task on Newmarket Heath on May 4th at one in the morning, and finished on June 1st at six in the evening. He used only fourteen horses, seven of which he rode three times. The course was from Hare Park to the ditch, making three miles, and thence three miles on the flat on the side of the ditch nearest Newmarket. Lamps and posts were put along the course to enable Mr. Woodcock to start before dawn, and so avoid riding in the heat of the day.

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CONTENTS.

Scab: A Review.

WE are in receipt of an advance copy of a pamphlet by Mr. Fred Verran, J.P., a Government Stock Inspector of the Old Colony, entitled "Scab: Its Nature, Cause, and Cure." Mr. Verran deserves cordial congratulations; his booklet is just what it should be. He points out the evils of scab in strong, simple, and convincing language, and in a manner that should best appeal to those for whom he is writing. His advice is eminently practical. Although the Scab Law of Natal is defective in many respects, yet, with the general desire of sheep farmers to keep their flocks free of the disease, this Colony, under normal conditions, is passably "clean." Nearly all the outbreaks of the disease can be traced to sheep introduced from the three surrounding Colonies, and hence it is to be hoped that in those Colonies, at any rate, Mr. Verran's pamphlet will have many appreciative readers. We extract the following, which deals with the duties of In-

spectors. "The Scab Inspector's life is by no means a happy one. He must at all times be on the watch He must put up with all sorts and conditions of men. He must have no friends or enemies, must put up with being reported for doing his duty, or not doing his duty. If he takes a pride in his work and does it well he is complained of as being too strict."

Sorrel.

MR. ALFRED PEARSE, Blesberg, Lidgetton, recently requested information respecting sorrel, which is becoming a nuisance on cultivated land in some of the up-country districts.

The plant was sent to Mr. J. Medley Wood, Curator, Botanic Gardens, Durban, who writes :—"It is a cosmopolitan weed ; I met it many years ago in the Mooi River and Nottingham Road Districts. It has probably been introduced here with seeds of cereals, and has no doubt spread considerably. It has no deleterious qualities, and nothing can be done but to destroy it wherever found."

Frieslands: Correction.

IN the "Interview" which appeared in the last issue there is a misprint. Mr. P. Otto, instead of saying that he had "no" objection to red in Frieslands, said that he had *an* objection.

Locusts.

THE Entomologist informs farmers in the Districts of Fox Hill and Manderston that young locusts are now hatching from the eggs deposited five or six weeks ago, and recommends their destruction at once with soap solution.

This solution should be in the proportion of one bar Sunlight soap to eight gallons of water, and it may be applied with a syringe.

Locust poison may also be used. This can be put on with either syringe, switch, or spray pump.

FORMULA.

Arsenic	...	1¼lbs.
Washing soda	...	1¼lbs.
Water	...	8gals.

Common sugar or treacle to sweeten.

District Reports.

BULWER, 28th December.—There is little to report during the last fortnight. We have had plenty of heavy rains, and also some pretty warm weather ; quite ideal growing weather, and in consequence crops look exceedingly well. The forage crops are attacked with the rust, though I do not think so bad as other seasons. Of course the Mapstone and Algerian oats are excepted, as they are apparently rust proof. One calf died in the village of gallsickness the other day, otherwise all kinds of stock is free from disease and in good condition. Fruit season has been good this year so far.

H. W. BOAST, Magistrate.

HARDING, 23rd December.—We are having any quantity of rain, mostly accompanied by thunder, which does not last long, but is very heavy while it lasts. The cattle at Ingeli Poort are still in quarantine for lungsickness. There is nothing in the shape of rinderpest in or about the Division, as far as I know. A question arose a little time ago as to whether clean cattle could get lungsickness from inoculated cattle. I should like to see what the general opinion is on the subject. I heard from natives that locusts had again paid us a visit down towards the Umzimkulu, but they were not doing much harm. I notice the fruit moth, which was so

troublesome last season, has not put in an appearance so far, but the commoner kinds of moth are at work.

P. W. Shepstone, Magistrate.

WEENEN, 27th December.—After the lapse of more than two months, another case of lung-sickness, in a previously affected herd on the farm Bushman's River Poort, has been reported. This emphasizes the necessity for a longer period than that of six weeks specified in the Act, for no less than three instances have lately occurred in this Division where this limit has proved insufficient. Nocturnal depredations among kafir goats near the Tugela have been frequent during the past fortnight, due, it is believed, to a leopard. Permission was given to organise a hunt in the hope of destroying the offender, but he is unfortunately still at large. A hailstorm, forming a narrow belt, passed over part of the village and agricultural settlement last week. It is a matter for congratulation to tobacco planters that their fields did not lie within the zone, or heavy loss would have ensued. The first pickings of this leaf have commenced, and it is probable that this year's output will more than treble that of any previous season. Crops in general look excellent, and stock of all kinds is thriving as it seldom fails to thrive in The Thorns.

C. G. Jackson, Acting Magistrate.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 5th February next :—

Moss Dale.—Red cow, branded on right hip LIFE & SO, indistinct.

New Germany.—Bay mare, about 14 hands, branded on left hind quarter PR. Poor in condition.

Nqutu.—Chestnut mare, white stripe down face, 14 hands 3 inches, mangy.

Bulwer.—One hamel unclipped, clip on lower side of left ear, no visible brands.

Acton Homes.—Black heifer, little white under belly, piece cut out of right ear, branded on right hip with broad arrow.

Pomeroy. — Mouse - coloured mule, branded PEC on left hip. Dark-brown mule, rather small, no brands.

Ladysmith.—Bay mare, tail and mane medium length, about 14 hands high, no brands visible.

Colenso.—Three kafir goats, one a black ewe, right ear slit, with a black-and-white kid, and one black ewe.

Howick.—Black ox, slit in ear. Black ox, white under belly. Black ox. Brown ox, long horns. Brown-and-white ox, long horns, slit in ear. Black and-white cow, slit in left ear, branded P in diamond.

Estcourt.—Brown mare, nearly black, two white hind feet, stripe down face. Brown mule, age two years. Bay mare, black points, branded JB right buttock.

Important to Employers.

IDENTIFICATION OF NATIVE SERVANTS ACT.

Act to Facilitate the Identification of Native Servants.

BE it enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Legislative Assembly of Natal, as follows :—

1. This Act shall not come into force unless and until the Governor shall, by Proclamation in the *Natal Government Gazette*, notify that it is His Majesty's pleasure not to disallow the same, and thereafter it shall come into operation by the same or any other Proclamation.

2. In this Act :—

"Servant" shall mean any native employed for hire, wages, or other remuneration to perform any handicraft or engage in any bodily labour in agriculture or manufactures or otherwise, or in domestic service, or as a boatman, porter, miner, driver, herd, or other occupation of a like nature.

"Master" shall mean any person employing for hire, wages, or other remuneration any native servant. For the

purposes of this Act the word "Master" shall mean and include any body corporate, company, society, or individual.

"Service," "Contract of Service," and the like expressions shall be understood in reference to the foregoing definitions.

3. This Act is not to apply to natives rendering service to a landlord in lieu of rent, when such service is rendered upon the farm on which the natives live, nor in any other service performed on the land on which they live.

4. A pass granted to any native under Law No. 48, 1884, or under any Law or Act for regulating the introduction of labourers into Natal, shall be a sufficient identification of this Act, for so long as such pass remains in force.

5. No native shall after the commencement of this Act enter into a contract of service, or offer himself for engagement as a servant in this Colony, or (save as is hereinafter excepted) continue in any employ as a servant, or be registered as a togt labourer, or under Law No. 21, 1888, unless he shall have obtained the pass provided for in this Act, and every person intending to engage a native as a servant shall first require the native to produce his pass.

Such pass is in this Act referred to as an identification pass.

6. Any native who is in service at the date of the commencement of this Act, or who, during a term of service loses his identification pass, may obtain a temporary pass, as hereinafter described, from the office of the Magistrate of the division where he is employed.

7. One of the officers attached to each Magistrate's office in the Colony shall be appointed by Government as a pass officer for the purpose of signing and issuing identification passes and temporary passes. In his absence, or if he be prevented from attending, any other officer of the department may, with the Magistrate's written approval, sign and issue such passes on his behalf.

8. The officer shall attend daily during the ordinary office hours to receive applications for passes.

9. For the purpose of obtaining an identification pass a native shall attend before the pass officer of the division in which he resides, and shall furnish to the pass officer the particulars necessary to be entered in the register.

10. Before granting an identification pass or temporary pass the pass officer shall in every case satisfy himself, so far as the circumstances seem to require, that the application is proper, and may in his discretion withhold the issue of a pass until he is satisfied that it ought to be granted. In case of doubt, the officer may require the native to be accompanied by his kraal head, or by some accepted person, to testify to his identity, and the correctness of the information given.

No such pass shall be granted if the pass officer is satisfied that the applicant is already under a contract of service.

11. The pass officer shall not issue a pass to any woman, or to any female child, or to any male child appearing to him to be under the age of fifteen years, without the consent of the husband, parent, or guardian, as the case may be.

12. Identification passes, with their counterfoils, shall be in the form of Schedule A, printed on durable material and bound in books.

They shall be numbered consecutively year by year, and the register thereof shall be kept in such manner as may be prescribed by the Secretary for Native Affairs.

Every native to whom an identification pass is issued shall keep it always in his possession and shall exhibit it whenever called upon to do so by his master, or by a police officer or constable.

Every master employing a native servant, other than a registered togt labourer, shall keep a labour book, in which he shall copy the identification pass of every native whom he may employ.

The master shall on no pretext keep a servant's identification pass, unless with the consent of the native.

13. If any master employs any native servant without having required such servant to produce his identification pass, or without having copied it in his labour book, he shall not be entitled to sue or prosecute such servant under the Masters and Servants (Native) Act of 1894, or to have any other remedy against such servant in respect of his contract or any breach thereof.

14. A temporary pass shall be in the form of Schedule B, and the period thereof shall in no case exceed six months, but it may be renewed upon the pass

officer being satisfied that the former contract of service still subsists.

A temporary pass shall not be available for the purposes of any new contract of service.

15. A native who has lost his identification pass may obtain a fresh pass from the office in which the former pass was issued, upon satisfying the pass officer of the fact, and upon paymenf of a fee of one shilling.

This payment shall not be required in the case of a temporary pass to take the place of an identification pass lost during service.

16. If any native who has obtained an identification pass in one magisterial division shall change his residence to another division, he shall present his pass to the pass officer of the division into which he has removed. The pass officer shall record the pass and inform the officer by whom the pass was issued, who shall record the change of residence.

17. If a native who is in service is convicted of any of the crimes to which this section applies, the Clerk or Registrar of the Court shall, as soon as conveniently may be, inform the pass officer by whom the pass was issued of the particulars of the conviction and sentence, and such officer shall record the same and shall make a note thereof against the entry of registration.

This section shall apply to all crimes of the following classes or akin thereto : —Theft, fraud, rape, and all crimes of indecency.

18. The Governor in Council may from time to time make rules for the purpose of carrying out the provisions of this Act, and for regulating any matters necessary for giving full and complete effect to the same. All such rules shall be published in the *Natal Government Gazette*.

19. Any native who shall after the first day of January, 1902, enter into a contract of service, or be or continue in service without having an identification pass, as required by this Act, shall be guilty of a contravention of this Act.

20. The following shall also be contraventions of this Act :—

Making any false statement or pretence for the purpose of obtaining or assisting anyone to obtain an identification pass, or a duplicate or copy thereof.

Using a false pass, or one belonging to another person, for the purposes of deceit.

Using any deceit for the purpose of evading the provisions of this Act.

The withholding of a native's identification pass.

21. All contraventions of this Act, or of any rules thereunder, shall be cognisable in the Courts of the Magistrates, and shall be punishable according to the ordinary criminal jurisdiction of the said Courts.

SCHEDULE A.

Identification Pass Counterfoil.

Act No. , 1901. Schedule A.

Division
No.
Date of issue
Name
Residence*
Father's name
Kraal Head
Chief

*State here whether Location, Crown Lands, Mission Reserve, or Private Lands.

Identification Pass.

Act No. , 1901. Schedule A.

Magisterial Division of
No.
Date of issue
Name
Residence
Father's name
Kraal head
Chief

(Signature)

Pass Officer.

SCHEDULE B.

Temporary Pass Counterfoil.

Act No. , 1901. Schedule B.

Division
No.
Date of issue
Name
Place of service
Employer
Term for which pass is to endure

(N.B.—This term must not exceed six months.)

Temporary Pass.

Act No. , 1901. Schedule B.

Magisterial Division of

No.
Date of issue
Name
Place of service
Employer
Term for which pass is to endure
(Signature)
Pass Officer.

Given at Government House, Natal, this Twenty-third day of December, 1901.

By command of His Excellency the Governor,

CHARLES J. SMYTHE.
Colonial Secretary.

The Queensland Redwater Immune Cattle.

BY H. WATKINS-PITCHFORD, F.R.C.V.S., Director Veterinary Department.

AS previously announced, the shipment of young stock from Australia has come safely to hand, and the results of the experiment will be followed with great interest by all stock owners throughout the Colony. If these animals prove to be immune to further attack of the redwater organism, the importance of the venture will be difficult to overestimate, for there is no doubt that great advantage will be taken of this knowledge by farmers, both in the improvement of existing herds and also in the re-stocking of farms depleted by disease and war.

The shipment consists of about 100 heifers of from one to two years old, and three young bulls of the Ayrshire breed, about the same age. The animals at first sight strike one as being, in many cases, somewhat undersized for their age, but it must be borne in mind that the object of the Government in introducing these animals into South Africa has been solely that of establishing the possibility of stock raised in other redwater countries being able to survive South African conditions. If this fact is happily established, the importation of more valuable stock will be undertaken with greater confidence, not only from Australia, but from other districts of North and South America, the stock of which has attained to a similar degree of immunity from this disease.

Through difficulties of transport, etc., these animals are arriving several months after the time arranged for, and will now be placed upon our Natal pastures at the height of summer, and at a time at which their powers of resistance to redwater will be likely to be tested to the utmost. When it is remembered that these heifers have been drawn from a redwater district —that is one in which the disease is endemic, and in which the stock are to a great degree immune to the disease— and that, in addition, they have through the kindness of the Queensland Government authorities been subjected to a severe test of susceptibility by the injection of virus, it will be seen that steps have been taken to render the result of the experiment conclusive. To the enterprise of Mr. Joseph Baynes, of Nel's Rust, the Colony must ever remain indebted for a spirited endeavour to prove that Australian immune cattle can survive Natal conditions. The S.S. *Kadina*, which was the boat bringing the 100 Government heifers, was chartered by this gentlemen for the transport of a large shipment of immune cattle, and this fine herd will afford corroboratory evidence of a most valuable nature upon this redwater question, which has so long and so heavily retarded the cattle industry of the Colony.

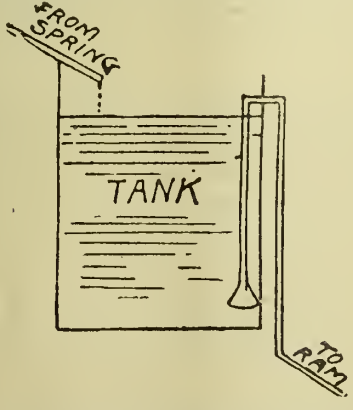
Viewed from a practical point of view there seems no reason to think that these animals will fail to withstand the conditions of the Natal veld. All the losses in the past, in this connection, can probably be traced to the failure on the part of the owner to assure himself that the imported animals were drawn from a district known to be immune to the disease. Conditions of acclimatisation, change of food, etc., have probably but small influence upon the ultimate question of survival, and, if these animals enjoy as high a degree of immunity from the disease redwater as we hope, it is

probable that they will live amidst any of the various climatic conditions of our Colony, from Durban to Charlestown, without difficulty. All these animals have been inoculated against quarter-evil, and are shown to be free from tuberculosis by the tuberculin test.

The following gentlemen have consented to take charge of small numbers of these animals until such time as the result of the enterprise can be accurately determined :—F. Churchill, M.L.A.; T. H. Hindle, Gilletts ; Mapstone Bros , Thornville ; J. W. Mackenzie, Richmond ; M. A. Sutton, Howick ; Hutchinson Bros., Balgowan ; J. King, Nottingham Road ; P. D. Simmons, Mooi River ; E. B. Griffin, Willow Grange ; J. W. Leslie, Ennersdale ; H. A. Greenhaugh, Glencoe ; Pepworth and Reid, Ladysmith ; F. A. R. Johnstone, Newcastle.

Syphon for Hydraulic Ram.

THE following description of the accompanying illustration, which we take from the "Farmers' Advocate," is furnished by J. B. Reynolds, Ontario Agricultural College :—The necessary conditions are : The ram should be situated from six to ten feet lower than the bottom of the tank, so as to give sufficient fall for the water when the tank is nearly empty. The end of the syphon opening into the tank should be widened so as to prevent sucking up air and water together when the water is lowered to the mouth of the syphon. The tank should extend nearly



a foot above the bend of the syphon, which ensures the filling of the syphon.

As soon as the water in the tank has risen a little above the bend of the syphon the water will begin to flow from the latter as from an ordinary pipe. The syphon action begins when the water is below the level of the bend, and will continue until the tank is empty, then the water will be sucked out of the syphon, and the tank will fill and the syphon begin running as before.

The dimensions of the tank will not affect the operation of the syphon, although for a uniform flow it would be necessary to have it shallow, say from two to three feet deep ; otherwise, any size and shape that is convenient. A large trough shaped tank will serve as well as any.

Veterinary Education.

SOME time ago when the terms of Mr. Andrew Carnegie's munificent bequest, under which the fees of all Scottish students attending Scottish Universities are to be paid under certain conditions, were announced, regret was expressed that the benefits of the bequest had not been extended to veterinary students attending the veterinary colleges. The Carnegie Trustees have recently had the matter under consideration, and have, it is understood, agreed to admit the claims of these students on the same conditions as those applicable to the general university students. These are, briefly, that the student must be over a certain age, and must be either of Scottish birth or extraction or must have given two years' attendance after the age of fourteen at a school or institution under the inspection of the Scottish Education Department. The student must also be able to pass a fairly stiff preliminary examination, the standard of such examination at present prescribed being the preliminary examination of the Faculty of Science in the Edinburgh University. It is not known as yet for certain how this point may affect students who have already entered upon their course of study, or whether for future entrants the present preliminary examination of the Royal College of Veterinary Surgeons will be sufficient, but in any case the concession is a most important one and is likely to have a far-reaching effect on veterinary teaching and progress in Scotland.

Gleanings.

Mr. Edward Topsell, who wrote on horses, among other animals, in the year 1607, tells us "concerning the drink of horses; brackish and troubled water, such as run softly, as in great ponds, is fittest for horses, because that water, being hot and thick, nourisheth better, but the swift water is colder and therefore more unwholesome." To encourage a horse to drink, it was recommended to wash his mouth inside with salt and wine, "and that will make him drink more liberally." Drinking much and "the horse thrusting his head in deep into the troubled water is an infallible sign of his goodness."

In buying their pigs in the country markets, English bacon curers, or rather their representatives, always give the preference to animals with good coats of hair, and invariably take occasion of the non-possession by a pig of such covering to belittle the value of the animals in the eyes of their owners. The reason for this is that bacon curers have found out that pigs with plenty of hair usually give a better quality of meat than those devoid of a good coat. Meat obtained from such pigs has the lean and the fat well mixed, and, as a rule, the fat is also of a firmer quality than that of the fatter and less hairy types of pigs to be met with in many parts of the country.

It is not generally known that two crops of cabbages can be obtained from one plant, and perhaps if it were known there are few besides small growers who would practise the art. When a good cabbage has been produced, cut it off without disturbing the roots; split the stump down nearly to the ground and continue to cultivate the soil as usual. After a short time several buds will form, all but one of which on each piece of stump should be removed. The solitary bud will develop a fine head, which can be cooked. If all the buds are left after the first cutting, seeds will be produced, and these will be as good as if raised from the first head, provided they are not crossed with pollen from inferior plants.

It is estimated that the value of poultry and eggs produced in the United States reaches the sum of £80,000,000 annually. Among the agricultural industries poultry is about fourth in position, only maize, wheat, and dairying ranking above it. The great live stock purchasing and meat-packing establishments have added poultry-packing to their businesses, and are buying poultry and eggs on a large scale and opening up new markets. The live poultry is bought and sent to centrally-situated places, where it is dressed and held in cold storage for market, being distributed in such quantities as not to glut the market at any time. This has greatly stimulated the production of poultry and eggs, and poultry farms are increasing rapidly in numbers.

A varied career has been that of Anthony Huxtable, the recently-retired huntsman of the Devon and Somerset Staghounds. "Pursuing many vocations," says Mr. Evered in his interesting book, *Staghunting on Exmoor*, "Anthony became in turn farm-boy, milk-carrier in Barnstaple, teamster, iron-miner, peat-cutter, and drainer (in which capacity he cut many of the finest gutters that he has since ridder over), quarryman, 'bus-driver, and billiard marker, showing an all-round aptitude."

Referring to the condition of farm labourers in England the "Agricultural Gazette" says:—"They stand out alone as the one agricultural class better off at the end of the century than they were at the beginning. Wages were never so high as they are now, and the necessaries and luxuries of life, taken altogether, were never as cheap before the last decade as they have been in that period. It may be added that employment was never before as regular as it is now. Labourers may have received more money when their wives and children worked on the land, and they were paid supplementary wages out of the poor rate under the old Poor Law; but it is certain that their standard of living is better now than when they and their families were treated as paupers."

In the Camperdown district of Victoria three dairy factories distributed to milk suppliers during the year ending June 30th, 1901, the sum of £157,000. The Camperdown factory purchased 3,320,140 galls. of milk, the Glenormiston 2,908,265 galls., and the Cobden 2,209,820 galls. In addition to these three large factories there are six smaller ones, so that the distribution of money from the dairy factories alone must reach considerably over £200,000 per annum. When the returns from the by-products, *i.e.*, calves, pigs, poultry, etc., and from milk or cream sent out of the district are also taken into consideration, it will be seen that the district in question is enjoying a marked prosperity through the development of the dairying industry.

Arrangements have been made, says the "Australasian," by Messrs. Vecht and Stokvis with Mr. Cecil Rhodes for the establishment of a bacon-curing factory in South Africa. It is understood that the supply of raw material is to be obtained from Australia, the meat being partly cured here, then frozen, and shipped, and finally prepared at the factory in South Africa, and it is believed that when the trade is built up a large quantity, probably 1,000 carcases per week, could be taken, if the supply is obtainable. Assuming that the project is successful, it will have an important effect on the pig-breeding industry. Hitherto there have been periodical depressions in the market for pork, as a regular export trade has never been established, but if some such price as 3d. per lb. could be looked for then the industry would be placed on a much more stable basis.

South Devons and Racehorses.

INTERVIEW WITH MR. WILLIAM HENWOOD.

By Ergates.

MR. WILLIAM HENWOOD, as many know, is a Mooi River man. There he has been farming for twenty-three years. From the Rosetta railway station the homestead is to be seen, as is also that of Mr. Bede Crompton, another Mooi River farmer of lengthy experience. Mr. Henwood's house is but 130 feet above the level of the river, and the coldness of the situation during the winter is indicated to the visitor by the absence of gums and wattles from the clumps of trees around the house. The climatic coldness, however, has this recommendation—it is healthy for stock.

South Devons.

As a cattle breeder Mr. Henwood is enthusiastic about South Devons, and this is what he said :—

"I have bred from the South Devon for eight years, and no better breed could I have for milk, butter, and for sale to the butcher. They are splendid beef cattle, and the beef goes down to their hocks and their knees. In England it is nothing unusual for cows to give five gallons, or thirty bottles, a day. I am quite satisfied with the improvement of one strain, and by and by the herd will be one of the best in the Colony. South Devons are very hardy, and, in saying that, I claim, as a Mooi River farmer, to be in the position to give an opinion. They promptly respond to extra feeding, to which, as all know, common-bred cattle do not. All whom I know who have tried South Devons are thoroughly satisfied. The cattle come through the winter, as their condition shows in early spring, better than any other cattle I know. They are the most docile cattle I have ever had to do with. Grade cattle sell at good prices ; two-year-old heifers, for instance, selling at about £26. It must be remembered that the South Devons are a totally distinct breed from the North Devons, and of late years great care has been exercised to keep the breeds separate. The North Devon is an animal for beef of the very highest class, is small, beautiful in appearance, and is favoured almost exclusively by wealthy land-owners for ornamental rather than profit qualities. As milkers they are decidedly poor. Into the South Devon Herd Book none are admitted unless they are certificated, and among the requirements of the commissions who give the certificates is absence of white except in the brush of the tail. They make capital trek oxen. I was induced to go in for the Devon breed by the success of Mr. Tom Hall, and upon the question of the North or the South breed my mind was open until I found out the difference in characteristics."

"What bulls have you had, and what was your luck with them ? "

"'General II.' was the first Devon I imported, and he died of pleurisy. The next was 'Councillor II.,' and he died of redwater. Then came May's Blossom, and he died of some liver complaint, but not conclusively diagnosed. My present bull is Ruler, Vol. VI. Herd-book, No. 1,058, and was calved 10th March, 1898. His two ends are perfect, and sirloin is splendid. He has the finest limbs of any beast I have ever seen imported ; he is active and of a quiet disposition. How long his career may be I cannot say. He has been 2½ months in the country, and has been ill twice, the first time from gallsickness and the second from liver. These sicknesses, I imagine, must be due to the sudden changes of temperature ; if a day is exceptionally hot an imported animal should be brought in and housed till the sun weakens."

Milk.

"No ; I am not selling milk ; the price is not good enough considering the present value of cows. I milk once a day, chiefly for the purpose of quieting the calves. The cream from that milking not required for the house goes to the Nel's Rust Creamery. The calves run with their mothers all day and at night time go into a large paddock."

The cow shed was big, and as is now to be seen where the farming is at all up to date, there were stalls for each cow, and to the mangers were attached chains to take the place of reims. As Mr. Henwood remarked: "Partitioning prevents poking, and chains don't hurt; reims, on the other hand, must be pulled tight in the first instance, and then the cows get them still tighter and more painful by tugging, and, moreover, increase the age appearance of wrinkles to their horns."

"And about hand-rearing of calves?"

"My opinion is this, that the system is impracticable unless one has plenty of good cheap labour. I don't see the need for the paraphanalia recommended by Mr. Alexander. If I have an orphan calf like the one you saw I rear it easily in the old-fashioned way of making it drink skim milk out of a trough I have reared successfully a great many in this way. But my mind is still open on the subject. For milking there is no choice for me as to kafirs or coolies. I have only one kafir. I won't have kafirs living on the place; for one thing on account of the mixing with their stock. I find that the coolies take a lot of interest in the cows and calves, and they never abuse them."

Crush Pen.

Mr. Henwood possesses a crush pen; it is a pity these pens are not more common. He believes that he was the second to make one in the Colony, and that the late Mr. R. G. Barnes was the first, whose pen he copied. In length they should be 9 feet 6 inches and in height 7 feet 6 inches. They are of immense advantage in catching stock for inoculation, branding, etc. and the crush pen has a very quieting effect on all animals.

Rinderpest.

"Bad luck," was the reply of Mr. Henwood to a question as to how he came through the rinderpest epidemic. "I lost 106," he continued, "tail on end out of 250. I, with my brother James, had bought three head of salted cattle in the Transvaal, but before we could bring them down Mr. Kruger suddenly put a stop to the export of all cattle. Consulting Mr. Pitchford I inoculated with bile. In three days the disease was in the troop. Four other troops close by which were inoculated at the same time showed the disease at periods varying from 7 to 29 days. I then inoculated with serum from the cattle which had been purchased, Kruger in the meantime having withdrawn his embargo. Here is a curious thing in connection with rinderpest. My calves never used to die in the summer previous to the epidemic, but for the three years following the outbreak they suffered much from diarrhœa. This year they are no longer so affected. It is, of course, possible that the cause is different from what I suppose, but my neighbours, whose experience has been just the same, hold the same opinion."

The Laboratory.

"I only wish," said Mr. Henwood, "that the laboratory were more accessible. It should, in my opinion, be on the railway—Hilton or Howick would be suitable places, and much healthier sites than the present for stock. It is difficult to get at from Maritzburg, and besides the loss of time it means a 10s. cab fare—a sort of expense that farmers naturally jib at. Land is now booming about Maritzburg, and Allerton would sell well. I feel sure that if Mr. Pitchford and his laboratory were more accessible that it would be a benefit for stock-farmers, and if he were in this way to come into closer touch with the farmers it might be better for his research work."

Sheep.

The Upper Mooi River District is considered one of the best situations in the Colony for sheep-breeding, and I expected to hear good accounts of this side of Mr. Henwood's farming. Here is his experience in his own words: "I began with 200 merino ewes in 1886, and in the year following I bought 130 more. For four years they did remarkably well, and I regretted I had not gone in for them sooner. They then fell off somewhat; I then introduced South Devon long-wool rams. For two years the flock did well and then fell off again, but what was much the worst of all they then became afflicted with what I call 'Kafir disease.' I knew they were being stolen and did all I knew to detect the thieves, but without success. I am well fenced, and none could stray. Dead sheep were easily to be found in

the paddocks, so the only possible conclusion to be come to is that the missing sheep were stolen. Catching De Wet is child's play in comparison to laying hold of kafir thieves on misty nights in this district—and those nights we have often for weeks without a break. Some of my neighbours have had lots of experience of detectives, and on that experience I engaged none."

"You could not bring the Tribal Responsibility Act to bear ?"

"No. We never found evidence near their kraals ; the river is handy for sinking skins or floating them away. The thieving is not done by my own kafirs. I have only one kafir on the farm - a volunteer who has been off and on with me for 15 years ; my labour, as I have said, is coolie."

Grasses.

Mr. Henwood's experience with imported grasses has not altogether been happy, but as failures are almost as instructive as successes, I give what he told me.

"I began," he said, "with prairie grass; that died out the first season. Then I tried rib grass ; that came up patchily and died out. Yes ; I tried it both on top and bottom soil. Italian rye lasted only one season, and clover planted the same year did not come up. On the strength of what a New Zealand visitor told me I tried thirty acres with cocksfoot. It seemed a very great success. I put 500 sheep into it at about the worst time of the year—the last two weeks of July and the first two of August—and they did well on it. It kept green and growing all the winter. The following season, with such encouragement, I put in 180 acres. It was on a dry ridge. Fertiliser? No ; I used none. It started growing well, and then locusts came along and cleared off all of it above the roots. Since then we have had a succession of dry seasons, and a very little of it is left. In New Zealand, my friend told me that cocksfoot kills down all other grasses. My first good luck with cocksfoot induced several neighbours also to go in for it, but they have had the same experience. In New Zealand, when grown with fertilisers, it reaches four feet in height, and makes splendid hay, which is largely shipped to Australia. New Zealand, of course, is a country with a heavy and continuous rainfall, not like ours, which these upper parts is now scanty and limited to a few months. Every year I cut a big lot of veld hay."

Winter Food : Ensilage.

Like most up-country stock-owners, Mr. Henwood is a great believer in ensilage.

"I have planted," he said, "for this winter 25 acres of mealies for forage. Unfortunately, the grub has been unusually bad, and I am replanting much of the land. The mealie stalks for ensilage should, in my opinion, be allowed to stop on the ground for a day before being stacked. The ensilage of my slowly-built stacks has always been of first-class quality, sweet, and of a beautifully olive green colour. Last year I happened—and what only rarely happens—to have plenty of labour available at the time for cutting. The stalks were carted on, and the stacks built in record time. This despatch was disappointing. The ensilage was dark and sour, and the worst I have ever had."

Chevalier Barley.

"I am putting in twelve acres of Chevalier barley. A neighbour does well with it He put in four sacks and got eight big buck-wagon loads of barley hay. All kinds of stock took greedily to it."

Manna and Oats.

"Hearing such good accounts of manna I am putting in four acres. In common with others I have had to give up winter oats for some five years owing to rust. In past years this crop proved to be the best of all winter oats because of its feeding qualities and the saving of labour owing to its being fed on the ground. I am going to put in 15 acres of Algerian and 30 of English."

Roots, Etc.

"No ; I don't go in for roots. They are too expensive to grow, and the necessary carting during the short days of winter is too big a business. But I can grow them well ; at Shows I have taken plenty of prizes for them. I have also put in a couple of acres of pumpkins, but next year I shall put them in with mealies in

the way you described Mr. John Marwick as doing. Grubs are very active this year. Land should be turned over in the early winter to minimise the pest. I shall do my best to get this done in future. A new pest is sorrel. I suppose it came to the Colony in badly-cleaned seed ; it seems as if it is going to become a curse to cultivators."

Implements.

Of our talk about farm implements there was but little worth recording. A double-furrow Columbia Gang plough, including riding attachment, price £14 10s., which he bought from Messrs. Steel, Murray, and is worked with ten ordinary farm oxen, Mr. Henwood speaks very highly of. It turns over twelve inches ; but he would much prefer one which would turn over fifteen inches of old land, but they are not to be got in the Colony.

Water Ram.

Until a few years ago Mr. Henwood always had water near to his house. During the recent droughty years that supply has entirely disappeared, and he now gets his water from the river by hydraulic ram power. The distance is over 800 feet and the rise is 130 feet. The ram cost ten guineas, and ninety pounds went for tanks and piping. It is the piping that runs into the money ; black piping soons rusts away, and the same happens just as quickly with the galvanised if not of good quality.

Horses.

"Let us now come to the stock in which you take the greatest interest—horses"

"Yes ; my fancy is in horses. I have a natural passion for breeding for the turf, and there is nothing I like to see more than a bit of blood in a horse. No ; I don't care a bit about betting On rare occasions I have backed a horse for five pounds, but sovereigns or hats are my usual stakes. Among others which have won races I have bred Viola, Capsome, Chink, Canyon, Chaos ; and among the thoroughbred sires I have had Capillaire, Vanquisher, Aristocrat, Vagabond, Crevasse, and King of Song. At present my stud horse is Pilcomayo. Breeders of thoroughbred horses do not meet with the encouragment they have a right to expect from local sportsmen. These sportsmen are evidently prejudiced against Natal horses, and are ready to spend money freely on second-and-third-rate Argentine and Australian thoroughbreds. With Virago I met four or five of them in one race and beat the lot easily. Chink, Canyon, and Chaos have also met them and beat them on their own merits. Other Natal breeders have had similar success, and yet in finding a market the merits of the local horses are unrecognised."

"What remedy do you suggest ?"

"I think racing committees would give great encouragement to local breeders were they to confine a fair proportion of races to Natal-bred horses. It would bring a demand that would enable Natal breeders to import even still higher-bred sires, and so improve the stock of the Colony. Our Government, like nearly all the Governments of the world, should also subsidize such races. It is an acknowledged fact the nearer military horses are to the thoroughbred the better they are. In England there are King's Plates and King's Premiums, and so the principle of subsidising is recognised by the British Parliament."

"Tell me something about Pilcomayo, your stud horse for the present season."

"Pilcomayo belongs to Messrs. Donaldson and Sieveright, of the Rand. He is a beautifully-bred animal, and has been a grand performer in Argentine and here in South Africa. He is by Gay Hermit by Hermit, out of Gordiana by Galopin. He is good tempered, has immense bone, and in every respect is a splendidly-made racehorse. The other stud horse, but from which I am not breeding this year, is Kloof, a bay horse five years old, by Crevasse out of Fortress by Aristocrat. He stands 17·2, and is faultless in proportion. Unfortunately, for beauty's sake, he has drooping ears. His dam evidently threw back to her Melbourne strain."

I saw the young blood stock, and certainly they were a promising lot. May they escape from disease, wire fences, and all other accidents to which the most cherished of young horses seem often to be specially fated.

Agricultural Chemistry for Beginners.

CHAPTER IV.

By ARCHIBALD PEARCE.

NITRIC ACID AND THE NITRATES.—NITROGENOUS MANURES.

NITRIC acid is chiefly noticeable for its salts, the nitrates; for it is in the form of nitrates that plants obtain almost, if not quite, all of their nitrogen. It is a liquid compound of hydrogen, nitrogen, and oxygen, very corrosive and poisonous, formed by the combination of an oxide of nitrogen with water, and is manufactured from a nitrate. It is a very striking instance of the way in which chemical compounds differ from their constituent elements, that the harmless gases of the air, first combining together and then with water, should produce the deadly poisonous and destructive nitric acid. The nitrates are almost entirely the result of the action of a microbe in the soil which has the power of converting ammonia into the nitrate of any base that may be present, usually lime, and so fitting it for the use of plants. This conversion takes place most readily in hot climates such as India, where, owing to the large amount of decomposing animal and vegetable matter in the ground, there is always a quantity of ammonia, and, consequently, of nitric acid, in process of formation: and this is so marked that nitrate of potash, or saltpetre, often occurs in considerable quantities in the soil, and is washed out and purified for sale. The chief conditions which favour the process of nitrification, as it is called, are warmth, air, moisture, and the presence of phosphates and of some base for the nitric acid to combine with. If we look into these conditions it will be plain that they are best fulfilled in a well-drained and well-tilled soil, for if the land is sodden and water-logged, or if it is packed hard and not well broken up, the air cannot get entrance. Moreover, it is probable that in the absence of air, not only do the nitrifying organisms fail to flourish, but another variety comes into action which actually undoes the useful work of the others, decomposing the nitrates and setting free nitrogen, which, as we know, is useless to most plants in its uncombined state. It is easy to see, therefore, how necessary it it is, for good results, that the land should be kept well stirred and drained if the crops are to receive the nitrogenous nourishment that is so indispensable for their well-being.

The nitrates are all very soluble, and not strongly retained by soils, so that they are easily washed away by heavy rains; for this reason, except where the rainfall is light, if used as a manure they are best applied as a top-dressing. This excessive solubility explains the difficulty there often is in keeping up the supply of nitrogen in arable soils without the application of nitrogenous manures, for there will be a gradual loss of nitrates due to soakage, which can only be partially replaced from natural sources. A small quantity of nitric acid is often formed in the air by the passage of lightning discharges through it, causing the oxygen and nitrogen to combine, and then form nitric acid with the water present. This then further unites with any ammonia that may be in the air, forming ammonium nitrate, which is brought down to the earth by the rain, and acts as a small supply of plant food.

NITRATE OF POTASH.

The two most important nitrates are nitrate of potash, also known as nitre or saltpetre, and nitrate of soda. The former has been manufactured on a considerable scale in the so-called nitre-beds. A pile is made of earth, wood-ashes, and any animal or vegetable refuse available, kept moist by watering with the drainage of stables or cattle-sheds, but covered to protect it from excessive wetting by rain. The mass is occasionally turned over to expose it to the air, and after a time large quantities of saltpetre are formed by the action of the nitrifying microbes, and this is collected and purified. A similar action goes on in a compost heap or an

ordinary manure heap; when thoroughly rotten there is a considerable formation of saltpetre, which is one of the most valuable constituents of such manures.

Nitrate of Soda.

Owing to its use in the manufacture of gunpowder, nitrate of potash has a somewhat artificial value, and its place as a manure is taken by nitrate of soda, which is found naturally existing in South America, whence it derives the name of Chili saltpetre. It is excessively soluble, and apt to absorb moisture if left in a damp place, and being in a state ready for assimilation by plants, it is perhaps the quickest acting of all manures. It may be applied to all crops which need nitrogenous manuring, but its effect is, as it were, to stimulate the appetite of the plant, and unless there is a supply of other forms of plant food available, the hungry plant is rather damaged than assisted. It should, therefore, only be used in conjunction with other fertilisers, at any rate with phosphates, and is best put on after the crop is up, as it is so easily washed beyond the reach of the roots. In fact, the safest plan is to apply the amount to be used in two or three light dressings with an interval between, or, as we say, in fractional top-dressings. It must not be mixed with superphosphate or any manure having superphosphate for a basis, as there will be a loss of nitrogen through the action of the acid in these manures. As a general rule, a good sample should contain about $15\frac{3}{4}$ per cent. of nitrogen, the usual standard being 15·65 per cent. corresponding to a purity of 95 per cent.

Nitrogenous Manures.

The farmer has often to ask himself whether a given crop should receive a dressing of nitrogenous manure or not; all that can be done here is to indicate the principles that should guide his decision. In the first place he must consider his crop, secondly his land, and thirdly the kind of manure to use. As to the crop, all cereals require a good supply of nitrogen, root crops perhaps rather less, while leguminous plants, which will be spoken of farther on, can practically do without any artificial aid in this direction. Potatoes, which are gross feeders, should always receive a dressing. But some soils are better supplied with nitrogen naturally than others; rich vegetable soils and loams containing a good proportion of decaying vegetable matter can often supply sufficient for the needs of a crop, while sandy soils often need it badly. Furthermore, it is plain that as animal or vegetable substances have first to decay with the formation of ammonia, and this has to be changed into nitrates, while ammonium salts have but one conversion to undergo and nitrates none at all, nitrogenous manures do not all act with the same rapidity. Such manures as sewage, blood, etc., act only gradually, giving a slow supply of plant food for a considerable period; while, on the other hand, it is quite possible for the effect of a dressing of nitrate of soda to be visible a day or two after application Of the purely chemical fertilisers, sulphate of ammonia and nitrate of soda, the former would be preferred in a wet season, the latter in a dry one, for obvious reasons. There seems, on the whole, little difference between their actual manurial effect on the crop.

In this connection, the system of green manuring with leguminous plants may be noticed. The legumes are an order of plants of which beans, peas, the clovers, lucerne, and vetches may be taken as examples; and their roots form the home of a species of microbe which has the convenient power of absorbing nitrogen from the air and supplying it to the plant. If then a crop of one of these varieties be grown, it will contain a store of nitrogen which has cost the farmer nothing; and if the crop be ploughed under, it will enrich the soil to a far greater extent than if some other kind of plant had been used, and the usual loss of nitrogen will be made up in the cheapest manner. It sometimes happens that the soil is free from the germs of these bacteria; in this case the absorption of nitrogen does not take place, but it has been found possible to inoculate the soil, so to speak, with the proper germs, and then the process goes on in full force.

Questions.

1. Show that chemical compounds often differ greatly from the elements that compose them.

2. Give instances where microbes are useful to the farmer.

3. Why do vegetable soils often not need nitrogenous manures ?

4. Mention all the nitrogenous manures you know of.

5. How much nitrogen is there in a ton of ordinary nitrate of soda ?

6. How much ammonia would that be equal to ?

7. What is the cheapest way of getting nitrogen into the soil ?

8. Why should you bury bean and pea stalks after the crop is gathered ?

9. What is the difference between ordinary saltpetre and Chili saltpetre ?

Mapstone Oats : Further Experiences.

M. F. Phipson, Fox Hill.

MR. PHIPSON reports sowing 50 lbs. of Mapstone Oats on 8th February, 1901, covering about eight-tenths of an acre, inland which had been previously manured and under a crop of potatoes. The forage grew well with practically speaking no rust, except in the last stage of ripening, when a little rust showed in places upon the straw, but not sufficient to in any way affect the seed.

The oats were reaped about September, and the ratoons which sprang up from the stubble rusted considerably.

The crop yielded about 2½ tons of good sound forage, from which was thrashed 813 lbs of good heavy oats.

Mr. Phipson intends sowing his seed in the first week of January next, as that sowed in February last, although irrigated, stood all through the winter.

Mr. Phipson's oats were examined on 21st August by the Entomologist, and Mr. Fuller reports that upon that date it was only by very careful searching that any rust at all was discovered, and then only an occasional streak upon widely separated plants. The oats stood then 4 ft. 6 in. high, and were carrying the corn well. Average plants were selected and sent to the Department of Agriculture by Mr. Phipson, and from these the following notes were made :—

Average stems to stool, 18·7.

Average seeds per head, 30·15 (varying from 20 to 46).

Straw, 3-20 to 4-20 in. in diameter at base.

Root system large, and fibres plentiful ; over 124 main roots counted upon one stool.

David G. Sclanders, Glenisla Post.

Mr. G. Sclanders reports as follows :— "I planted 50 lbs. of Mapstone seed in a fairly rich piece of sandy soil on 6th April, 1901, and reaped 560 lbs. on 28th October, 1901.

"There was a little rust in the straw, but nothing of any consequence. I had a strip of Cape forage planted alongside of the Mapstone, which was very bad with rust.

"I believe the Mapstone oat to be equally as good as the Algerian, which it very much resembles, but the Mapstone ripens about one week earlier, and my Algerian oats also had a little rust."

M. Sandison, Berg Vlei.

Mr. Sandison reports having planted 50 lbs. upon about five-eighths of an acre on 5th April, 1901. No manure was used, and the crop was irrigated three times. During the months of September and October the oats grew out well, the straw being tall but fine, and the head rather light. The crop was reaped upon 1st November, and was considered a good one without rust or smut. It yielded, when thrashed, 1,200 lbs. of dressed seed oats of good quality.

H. Naudauld, Umlaas Road.

Mr. Naudauld reports having planted on 4th February, 1901, the oats growing to 3 ft. in height, but without corn. It was then cut down with the machine, and came on again splendidly, corning well. The crop was reaped on 1st November, and yielded, on thrashing, 440 lbs. of seed.

Mr. Naudauld states that he planted Cape oats by the side of the Mapstone,

but this only grew a foot in height when it died off with rust, whilst the Mapstone had no sign of rust upon it whatever. He further adds that he is quite satisfied that the Mapstone is a rust-proof oat.

HUTCHINSON BROTHERS, BALGOWAN.

Messrs. Hutchinson Brothers write as follows :—' The 50 lbs. Mapstone seed oats received by us from the Agricultural Department was sown on 1st March, covering half an acre of ground.

"The land was in good order, having been fertilized for mangels in December, 1900, with 3 cwt. bone dust, 3 cwt. Thomas Phosphate, and 2 cwt. natural guano per acre. The mangel crop being a failure, the land was reploughed and sown with the oats.

"On 25th April, 1901, the oats being a fine heavy crop, we put some sheep on to graze them off. Unfortunately, being only a small plot, the sheep trod down more than they ate, and did a certain amount of damage to the crop. They were taken off again on 6th May.

"All through the winter the oats kept growing slowly and came on well in the spring, giving a good crop for either forage or seed. They did not ripen evenly, and had to be cut at intervals, 26th November to 6th December.

"Total weight of crop from half acre was :—

Cleaned Seed	...	1,172 lbs.
Straw	...	2,296 „
Total	...	3,468 lbs.

"There was no rust at all until just as the seed began to ripen, when a little appeared, but only in places, and not enough to do any damage either as seed or forage.

"There is no doubt we made a mistake in planting the oats so thickly, the 50 lbs. of seed could easily have covered an acre."

JAMES GORDON, SPRINGFIELD.

Mr. Gordon reports that 25 lbs. of Mapstone oats were planted 22nd March on half an acre of land without manure, as the land had been previously under potatoes manured with stable manure and wood ashes. Owing to the lateness of the sowing, insufficient autumn rains, and absence of means to irrigate, the growth was too short to cut and too feebly rooted to be fed off in winter. With the spring rains, however, the crop grew fairly well, and matured at a height of 2 ft. 6 in. without a particle of rust being perceptible to the naked eye throughout its entire growth. On account of the irregular way the oats ripened the crop was reaped at different times during the fortnight ending 30th November. The yield was 910 lbs. of very plump seed, and approximately 1,000 lbs. of straw.

Mr. Gordon adds that Winter and other oats planted for winter grazing about the same time as the Mapstone were completely rusted off.

E. C. NUSS, KRANTZKOP.

Mr. Nuss writes to the Entomologist stating with regret that during his absence from home his field of oats had been completely destroyed by a troop of cattle. He adds that when he left at the end of August last the oats looked very promising, and he and his neighbours agreed upon their superiority to other oats.

CHAS. L. LUND, MALDON.

Mr. Lund writes, under date 2nd December, as follows :—

"I received about 50 lbs. of Mapstone oats and sowed them on about an acre of good unmanured land that had been twice ploughed. The oats were sown on 22nd April, immediately after a good rain, and while the land was in very good order.

"I reaped the forage on 24th October—six full months after sowing it. The intolerable while this oat takes to ripen is a serious thing against it when grown in the winter under irrigation, as it is not ready to reap until the mealie planting season, when all hands are required for planting, etc.

"The crop was a heavy one. I estimate that I got about two tons of forage from the 50 lbs. I have not yet had the oats thrashed out, but I do not expect a very heavy yield of seed, as the birds did an enormous amount of damage despite the efforts of two kafirs to keep them off.

"I am sorry to say that, contrary to the majority, I have to report that the forage rusted rather badly. In fact the Cape oats sown in the same field and at

the same time, but reaped two months earlier, were much more free from rust than were the Mapstone at the time of reaping.

"I am not very favourably impressed with the oats for winter sowing, and from what I can see there is scarcely any difference between it and the Algerian. I ought, perhaps, to mention that until within a few weeks of cutting the forage there was not a sign of any rust in it. This leads me to think that the oat, if sown in the summer, would not be rust resistent, for no sooner had the warm weather fairly commenced than the rust made its appearance."

Botanic Gardens, N.S.W.

THE following is extracted from a very lengthy report by Mr. J. H. Maiden, the Director of the Sydney Botanic Gardens. The extracts will in some degree show the interest being taken in other colonies as regards botany.

Arrangement Ground.—A beginning has been made to form a series of beds between the groups of dicotyledonous plants and the monocotyledons.

Other Beds and Borders.—A handsome new carpet bed was formed on portion No. 22, Lower Garden, near the sea-wall. The work was executed by Messrs. Allen and Lovegrove, who have charge of the carpet bedding, and the design consisted of a large map of Australia, showing the names of the federating colonies, and bearing the words: "Federated Australia, 1900" I am not in favour of maps, diagrams, and profiles being introduced into carpet bedding as a rule; but the event commemorated in the present instance is altogether exceptional, and the design and execution of the bed in question have been warmly commended by the public.

Medicinal Plants.—I never lose an opportunity of adding to these plants, and I trust that my correspondents throughout the world will kindly continue to send seeds and cuttings when convenient.

Rock Garden. — Minor improvements have been made to the rockeries, but my idea of having a good rockery—a veritable garden of rock plants—has not yet been realised. Of course, in this climate, we cannot expect to grow the Alpine plants one sees so frequently in European gardens; but, by way of compensation, there are many rock plants that can be grown here in the open air which cannot be so grown in Northern and Central Europe.

Creek and Ponds. — The ponds were drained off, and an enormous quantity of silt removed at a considerable expense.

Lawns.—The silt already referred to as having been removed from the ponds has been utilised in raising and levelling the lawns in the Lower Garden.

Plant-houses. — In my last report I alluded to the fact that the materials for another iron hot-house, identical with two already in the garden, had arrived from England. This house has now been erected, and has been in use for some months. It is, in fact, crowded already, as all our houses are, eloquent testimony to the way in which our collections are increasing. We have now three hot-houses of identical pattern. The one nearest the palm-house is now devoted to tropical ferns, the centre one to orchids, as before, while the new one contains the collection of miscellaneous plants formerly in the fern-house. I am still, like Oliver Twist, asking for more. At present, as I mentioned in my last report, we badly want separate houses for palms, aroids, aquatics, and economic plants. The public are frequent in their expressions of pleasure at the recent improvements in the glass-houses, and if the Chief Secretary should see fit to ask Parliament for a further appropriation to enable us to grow additional plants which cannot be grown out of doors in our climate, I venture to say that such a course would give pleasure to a large number of our citizens.

I am very anxious, indeed, to further group and classify our plants under glass, and this is only possible with additional houses. Because of the varying size and difference of treatment of plants it is not practicable to arrange them strictly in natural orders, and the orders in proper sequence, but such an arrangement is my ideal, and I shall strive towards it. The keeping of allied plants together will enable a visitor to see at a glance what we have got—to note our s rong points and our deficiencies, and he will be able to acquire knowledge which can only be gained by a convenient comparison of forms. At present the arrangement of a so-called "miscellaneous house" reminds one of the art of a window-dresser; effect is chiefly gone in for as in the shop window of a grocer or a draper, and hunting for a plant amongst the display of pretty or interesting things becomes a matter of difficulty. We know ourselves where our plants are, but a visitor who can only occasionally see our treasures often hunts vainly for a plant in the kaleidoscopic changes which are constantly taking place in any particular house.

We have taken the opportunity presented by the laying of pipes to the new house to re-construct the heating arrangements in the other houses—to the very great advantage of the plants themselves; the convenience of working the system being improved at the same time.

New Buildings (other than plant-houses).—The National Herbarium building, whose structure was described in my last report, was formally handed over to me in the early part of the year. Then the task of arranging the contents of the herbarium and of preparing the museum for the public was entered into in earnest. It was not finished before my departure from the Colony in June, and my assistants, Mr. Betche, Miss Hynes, and Mr. Camfield, worked so hard that it was very nearly ready for opening at the end of the year.

National Herbarium (Phanerogams and Ferns). — Mr. Betche completed the arrangement of the Australian collection during the year. We now know our weak places, and are endeavouring to strengthen them.

Miss Sarah Hynes, B.A., who joined the staff as Second Botanical Assistant on 1st July, has done good work in the herbarium, her chief duty being the arrangement of the exotics, which already amount to a large number, and are being steadily added to.

Mr. Camfield has rendered yeoman service in the collection and determination of both Australasian and exotic plants, and continues in the most unselfish and unassuming way to devote much of his spare time to the development of the collections of this institution.

Mosses.—Mr. W. Forsyth, in charge of the moss-herbarium, reports as follows:—

"I have pleasure in reporting satisfactory progress with the moss-herbarium during 1900. During the months of September, October, and November I was fortunate in making several fine collections of N.S.W. species in the following districts. . . .

Algæ.—Mr. A. W. S. Lucas, M.A., the honorary curator of the Algæ, reports that he is making fair progress with the naming and arrangement of the Algæ, and regrets that the time at his disposal has not permitted him to put the duplicates in order for purposes of exchange.

Fungi.—Mr. Alexander Grant, in charge of the collection of fungi, has been assiduous in the collection of such plants during the year; has named those sent by a large number of correspondents, and is busy preparing the spirit collection for the museum, and is also arranging the microfungi for the herbarium. A large number of forms have been brought in from the garden, and the collection is not only attaining respectable dimensions, but a beginning has been made in the way of exchanges.

Lichens.—A number of acquisitions have been made to the collection during the year, but the lichen herbarium has not been arranged for want of the assistance of a specialist in this group of plants.

A Laboratory wanted.—Since I remarked on this subject in my last year's report I have visited the Jodrell Laboratory at Kew, and other laboratories for plant physiology, &c., on the continent of Europe. I am more than ever impressed with the desirability of erecting a neat building for the purpose within the Gardens, to further the researches of botanists other than systematists, who are already well provided for.

In June I had the pleasure of welcoming the members of the Horticultural Association of New South Wales in the museum building. Unfinished as its contents were, the members expressed themselves as much pleased with what they saw, and I hope this pleasant gathering is the forerunner of meetings in the building of this and other horticultural and scientific societies.

Public Lectures.—I gave no public lectures on botanical subjects during the year. I had arranged for some during the winter months, but my departure for Europe necessitated the cancelling of all such engagements.

Departments of Agriculture and Forests.—I have made many reports, particularly to the former Department, during the year. The majority of the reports are on weeds, whether they are likely to be injurious to stock, or deleterious to the farmer or pastoralist in any way. In addition to these, reports are asked on the most varied and interesting subjects. I often report at length for the benefit of farmers, feeling sure that much practical good is done in that way. The reports and articles are printed in the *Agricultural Gazette*.

Botanical Survey of the Colony.—Work in this direction has advanced a stage during the year, and I am collecting the necessary maps for the purpose of recording the indigenous flora.

Collecting and Botanical Tours.—I made but few botanical trips during the year, owing to my departure for Europe. In the United Kingdom and Ireland, France, Germany, Holland, Belgium and Ceylon, I visited many of the principal botanic gardens, parks, and herbaria. I attended the International Botanical Congress held in connection with the Paris Exhibition in October and the botanical section of the British Association for the advancement of Science held at Bradford in September. Everywhere I was received with great kindness and consideration. I have cemented old friendships, made new ones, and, above all, I have obtained a fund of practical information in regard to botanical and horticultural establishments that will be of the highest value to me in the carrying out of my duties. My time was limited, but I tried to make the best of it, and I have brought back with me a mass of information to which I frequently refer, I trust, with profit.

The botanical trips undertaken by Mr. W. Forsyth are recorded in his report (supra) on the moss-herbarium.

In the *Public Service Association Journal* I wrote popular articles on the prominent plants in the Garden, in flower or fruit, month by month, for the months of March April, May, and June. These articles, like my other work, were interrupted by my visit to Europe.

Guide to Gardens.—I have spent a good deal of time during the first half of the year in the laborious work of obtaining additional materials for the much-needed guide. I have modified my former plan of preparing a complete guide to the Gardens, and have, instead, decided to prepare a guide to the principal plants and points of interest. This is well under weigh, and if it is not printed during 1901 it will be for some reason unforeseen by me. I have also in contemplation the issuing of cheap guides to special groups of plants, *e.g.*, the Cycads, Conifers, Palms, contents of the glass-houses, and so forth. In this way I shall utilise certain matter which I have accumulated, and which I have not inserted in the guide now nearly ready for issue.

Water Supply — Following is the registered supply of water during the year :—

Meter No. 215, Gardens, 3,543,000 gallons ; meter No. 217, W.C.'s, &c., 1,491,000 gallons ; meter No. 221, Propagating Ground, 787,000 gallons ; meter No. 224, Museum, Aviary, &c. 203,000 gallons ; meter No. 225, Director's residence, Cactus beds, &c., 223,000 gallons.

Street Tree-planting.—This work has been carried out by several suburban municipalities, and there seems to be a growing feeling that something should be done in this direction in the Municipality of Sydney itself. In saying this I do not lose sight of the fact that the narrowness of many of the Sydney streets renders planting in them a matter of impracticability.

Plague of Flying-foxes.—During the month of March we were visited by immense numbers of flying-foxes. There must have been many thousands of them, and some of the large trees were quite

black with them. We called in the aid of a number of local sportsmen, who shot large numbers, and the destructive animals were all killed or flew away in about a week from the first appearance of the swarm. It is many years since the Gardens were visited by a plague of these animals.

Correspondence. — Letters registered from 1st January to 31st December, 1900, 4,554, being 716 fewer than during the corresponding period of 1899. Letters despatched from 1st January to 31st December, 1900, 3,200, being 2,030 fewer than during the corresponding period of 1899. I believe that my absence from New South Wales is mainly responsible for this great falling off in letters to correspondents.

"A Smuggling Adventure."

By Hippias.

I THINK it was in the summer of 1843 that I found myself in a little cottage on the seaside, with my eldest sister for company, my dog "Major" for amusement, and my books for work. I was rather behindhand with the latter, and had a spell of hard reading to do before going up for my degree. It was really two cottages that we occupied, each containing a room above and below, the doors of each opening upon a grass plot abutting on the road from Torcross to Kingsbridge. Beyond the road lay the reed-embedded waters of Slapton Lea, a kind of mere, into which more than one inland brook discharged itself, but which had no visible outlet, its waters percolating through the sand and shingle (which rose several feet above its surface), and finding their way unseen to the sea. At one point, indeed, the distance between salt water and fresh was so small that in high spring tides and under the pressure of a strong easterly gale the waves had been known to sweep over the sandy barrier and invade the placid lea, bearing destruction to thousands of roach, perch, and pike, and depositing shoals of sea fish in their stead. Such an irruption had taken place within the memory of some of the villagers, who had found great use for their nets after the subsidence of the storm. I have never heard that it has been repeated, and long before my visit nature had repaired all damages, and had restocked the lea with its original inhabitants—pike of large size and fine condition figuring, not infrequently, in the record of a day's sport on its waters.

This remarkable lake or lagoon extended to a length of two or three miles along the inner side of the beach, and had a width of from a quarter to half a mile. I use the past tense, as I know nothing of its present state. It was overgrown by enormous beds of reeds, in which moorfowl, waterhens, and coots abounded, and in which, at certain seasons of the year starlings literally swarmed. I have known sixty of these birds killed at a single shot. Snipe, too, for some days after their arrival at, and previous to their departure from, the shore, chose the reeds of the lea as a convenient resting place; as many as twenty couple have fallen to the discharge of one barrel. I see that Daniel, in his "Rural Sports," ascribes half that number to the Duke of Marlborough's keeper, but does not give the locale. I am well assured, however, that the number here given is no exaggeration. I had full permission from the owner, Sir Robert Newman, of Mamhead, to shoot and fish on the lea, and had a boat at my disposal. The reader may imagine that, after devoting four or five hours to Aristotle and Thucydides, my time would be very pleasantly filled up.

There were no trout in the lea; but the roach used to play on the surface like a "schule" of mackerel, and I often hooked three, and sometimes four, at a cast, using three droppers in addition to the stretcher. I used to set half-a-dozen trimmers in different places, and it was great fun hunting them up and down the lake in a boat; but the pike is not a summer fish, and had they not been

getting too numerous for the welfare of the roach, I should have left them alone. I see, by the way, that a correspondent of the *Witness* advocates the importation of this monster. I doubt his thriving in our rapid and rocky streams; but am quite sure that no trout would thrive in his neighbourhood, and as we have already to deal with the siluroide, or barbel, who may prove a more dangerous enemy than we imagine, but, at the same time is boneless, and when properly cooked by no means unsavoury, I think we should pause before we risk the ruin of a successful enterprise by the importation of a fish which is known in England as the freshwater shark, and which is unsuitable to a country in which, owing to its sloping surface, there will never be extensive ponds or lakes, or any large sheets of water unconnected with the rivers, which will be all, at no distant date, stocked with the salmo ferox. We had better let well alone, lest we tumble into it.

In those days smuggling was not yet a thing of the past, and at many a farmhouse and, if rumour speaks truth, at the tables of either parson or squire, you might, if a privileged guest, try the contents of a bottle of French brandy from which the revenue derived no benefit; and, peradventure, listen to a stiff yarn about its transit into the bargain.

As I was often on the bay, either running along the coast line, tempting mackerel with the glitter of shiny metal, or at anchor, fishing with squid bait for whiting or gurnard (called red tub); and as I occasionally took a place in one of the larger boats for a night's conger fishing, outside the Start, or to take up the crab-pots set some nights before in favourite spots, it may be concluded that I was on fairly intimate terms with the fishermen, and that few of their private affairs were, after a time, any secret to me. Among them, smuggling held a prominent place; and it found in me no antipathetic listener.

Now I am not going to enter into a defence of what is, at best, an illegal practice; and will only suggest that—suppose the political world to be divided into two classes, Protectionists and Free Traders (as it formerly was into Whigs and Tories), neither can the former consistently abuse a practice which owes its very existence to their policy, nor can the latter hurl condemnation upon those who are only carrying out in detail the principles upon which their system is founded; for is not the "fair trade" free trade? However that may be, I was fascinated by the spirit of adventure, and more than half promised to take a run across channel for the mere fun of the thing, though, of course, I declined any share in the commercial part of the enterprise.

At that time, two or three successful runs having been made, and the cargoes carried safely into the recesses of the moor, the Goverment had been put on the alert; and three revenue cutters, duly armed and equipped, had been for some weeks on the station, patrolling the coast, from Exmouth to the Bolt Tail, at the end of Salcombe Bay. A smart coastguard officer too, whom we will call Captain Winstead, had been appointed in Start Bay, with directions to keep a sharp look out. I had made his acquaintance, as he had taken a cottage in our immediate neighbourhood; and I need scarcely add that the chief topic of conversation was the prevalence of smuggling, and the captain's avowed intention of suppressing it.

It so happened, that a wedding was about to take place in our family, which my sister was bound to attend, but at which I had no mind to be present, so that for several days I was the solitary occupant of our cottage, and was longing for a bit of excitement.

My chief comrade among the fishermen was one Lorane; he had been in France, and had picked up other things besides a smattering of the language. He could sail a lugger to perfection; and had taught me enough to make me something more than live lumber in a boat.

He was the leading spirit in what still survived of life in the smuggling enterprise, and went at it (so to speak) with a joyous rollicking dash that was very enticing. As for the three cutters, the "Royal Charlotte," the "Lion," and the "Shark," he laughed at them, and said he would run a cargo right under their noses.

A day or two after my sister had left, I strolled into the village, and found Lorane's partner, Wood, busy among spars and sheets, masts, and buckets of tar,

evidently preparing the boat for something beyond the usual fishing trip, and as plainly displeased and put out by my appearance. He was a big, slouching, loosely-made man, with a most forbidding countenance, scarcely improved by an enormous bunch of currants on his right cheek, called in Devon a "langing mark," which, in the fruit season, glowed a bright red, but at other times was a dirty pink, and gave him a most sinister appearance. He had, on all occasions, silently resented my presence in the boat, which did not either lessen or increase the intense dislike with which I regarded the man. He at first evaded my questions, but when pressed grudgingly mentioned something about "Ogydent," which I had already made out to be the Devonshire reading of Aguadiente—the brandy which the fishermen got from Portuguese ships encountered in mid-channel by the conger boats, in fact, the Portuguese *Eau-le-vie*. The fishermen had caught the word from the Portuguese sailors, and used it as a general term for foreign liquor. Smelling a rat I left my sulky friend and sought Lorane, who soon informed me that he was off to Brest for a cargo of brandy, and hoped to start the next night; that he expected a spell of dirty weather, and hoped to run in somewhere about Hall sands at a date which he specified; and that if I would be down then with my dog I might be of great help. He could tell me no more, and I spent the afternoon on the lea whipping for roach, till I had filled my basket—a very deep one, made in Havre of peeled osiers—twice over. I had never seen such feeders; they literally fought each other for the fly; and as they averaged three-quarters of a pound each I had the landing net full every five minutes. They were in fine season, too, but the bones were far too numerous for me to attempt their deglutition, so I handed over the lot to some of the Torcross boys, who received them with shouts of delight, and took home a brace of moorhens which I intended for supper; but so fishy was the flavour that I was glad to fall back upon a tin of potted wheat-ears, which my dear old grandmother had sent from Cornworthy, and which were simply delicious.

And now I must tell the reader something of my dog "Major," who had been swimming up and down the lea hunting for trimmers, and had brought back two fine pike, which had lately spawned, and were given to the pigs, who seemed to enjoy them. As "Major" was the produce of a Newfoundland of the smaller and improved breed, crossed with a notable Irish setter, he, of course, belonged to that important section of the canines in which, from the noisy little cocker to the noble St. Bernard, we find that combination of nose and brain, of scent and intelligence, which gives to the spaniel its principal value and attraction. He was bred in the kennels of a neighbouring squire, from whose keeper I purchased him, partially trained and, fortunately, unspoilt.

I was at Oxford then, and the appearance of dogs in Quad. was strictly forbidden; and to see "Major," in the corner of the entrance archway, taking a careful survey to ascertain that the space was clear of Dons, and, when satisfied, making a rush for my staircase, from the window of which he would watch for my arrival, or that of my scout, with a patience little less than sublime—to see this was to confess that instinct is on the same plane as reason, and but little inferior.

I have often dropped half-a-crown in the gutter just outside Magdalen, and sent "Major" back from the "Mitre," to which he has returned with the missing coin in his mouth. And when he had been engaged in any mischievous prank, such as barking at the Proctor and his suite of "bulldogs," or flying at the velvet sleeve, which kindled a peculiarly savage and unnatural wrath (the wonder of all but the initiated who had been present at the training), or in other acts of insubordination repugnant to the statutes, he would, instead of claiming his master's protection, dash out of town through the bye-ways of Holywell and the parks, give his pursuers a fine run over the Cherwell meadows, and when he had led them half way to Islip, grassed them in slimy ditches, or all but drowned them in the river, he would return in the dark to New College, and quietly await the arrival of of some belated undergraduate to obtain entrance; when he would either slink along under the wall to my staircase, or betake himself to the precincts of the Junior Common Room, where he always found a welcome and ample supply of food.

Of course he was spending the "long" with his master, and had made friends with the bulk of the fishermen, but two or three of them had, by playing what he considered low tricks upon him, incurred his displeasure, and among them Wood was his special aversion. He showed this chiefly by giving the man a wide berth, or resenting his proximity by smothered growls. As the dog was thoroughly good-natured, I knew that there must have been serious provocation; and kept "Major" well in hand.

How long the boats were absent, I cannot now remember; the memory of those early days has been absorbed by many a stirring event. I know that I passed most of the time with Captain Winstead and his daughter, riding up and down the coast between the station and Start Point, till the natives began to look askance at me, half suspecting that I had sold them.

I think it must have been about a week after my last interview with Lorane that I walked along the beach to keep my tryst with him. It was a dark night, but I made out ten or a dozen figures, apparently straining ears and eyes over the quiet sea; and when a light suddenly shone out for a second or two, at some distance, and then vanished, the silence was only more intense. Presently a shrill whistle sounded out of the sea: after a short interval its ditto was repeated a few feet from where I was standing, and was immediately answered by a third. As this was the signal, I at once sent "Major" in: he swam steadily out, and in less than ten minutes returned with a stout line in his mouth, which ended in a stouter rope, at which the dark figures falling into line, hauled steadily. At the very edge of the sand were sundry logs of wood like railway sleepers, with rounded notches in them to fit the wooden keel of the boat. No sooner had the boat touched ground, than one of them was slipped under her; at the next pull she landed on another; and so on, till she was clear of the sea. I need not say that she was emptied in a trice, and the kegs, as dawn was nearing, were buried, for the time, in shingle and sand, well above high water mark. I ran inland to a spring, gave "Major" a good drink, and then bidding him keep good watch, left him seemingly asleep on the beach, and returned to my cottage, which I reached before 4 a.m.; turned in, slept for 4 hours, and was up fresh as a lark at 8; when, after a bath, and a good breakfast, I was fit for anything.

Just then, came a message from Captain Winstead to ask me to join him in a ride; and as I had hired a horse in the village, I was soon ready. We rode towards the Start, Captain Winstead telling me that he expected a cargo to be landed that night, and that he was prepared for them, and to capture both kegs and men. Just here there was a break in the cliff, and a large space full of brambles and undergrowth, and rich in flowers, which looked like an old disused quarry, but had probably been formed by an irruption of the sea at some distant period. I remarked, casually, that it afforded a good hiding place for smuggled goods, and Winstead took the hint, and set his men to work, joining eagerly himself in the search.

Just then a fisherman came up and said, "Us can't get yeur dog to meuve, sur: us got the orses and crooks a waitin, and Wood, ur saith will break skull for 'un if yew doan't come and get 'un away." I looked at Winstead, who was off his horse, and poking among the bushes, and galloped as hard as I could for the beach. But before I got there the dog and man had met. Wood had lost patience, and struck at the dog; but "Major" was upon him before the stick came down; and his feet failing in the act, he fell. "Major" had not bitten him, but his feet were on the man's chest, and the air was resonant with his furious barks. I called the dog off, and he came at once; I told the man, on whose face the currants had turned to an indescribable hue, that he lied in charging "Major" with an unprovoked attack; I advised him to keep the horses back till I had got Winstead away, and galloped back to the Coombe as hard as I could. I found Winstead beating the ground as steadily as though he were drawing a cover for game, and had to wait till he was content that he had drawn it blank; when I persuaded him to ride on to Start Point, and take a survey of the bay and the offing. As this involved a climb to the lighthouse, a careful adjustment of telescope, etc., it was late when we turned our horses' heads homeward, and evening was far advanced

when we reached the village and separated. I then heard that within half-an-hour of my leaving the spot, the kegs were in the crooks, and the horses well on the road to the moor. I had told "Major" to attach himself to Lorane, and he appeared later on at the cottage with his head carried high, with a very decided air of "all right" about him, which I quite understood.

Captain Winstead, if still alive, still believes that the kegs were thrown over board when Lorane baffled the preventive cutters by running close in to the Skerries—so close, that it looked like certain death, but meant escape, not defiance ; and I had had my first and last experience of "The Fair Trade."

Size of Cows and Product of Butter.

NEWSPAPERS are publishing a statement with respect to a test of the butter-producing capacities of a herd of forty-five cows, but fail to say where the trial was conducted. The test is said to have lasted over a year, and it was found that the bigger the cow the less the quantity of butter produced as compared with her weight. Of course, the larger the cow the more food would she need to support her body ; therefore the cost of her butter would be greater than that of a smaller cow, and in the course of, say, ten years her beef, if sold to a butcher, would have cost probably a good deal more than its worth in consequence of the great extra annual consumption of food. This would be extra costly if bran, pollard, crushed oats, meal, and copra cake were allowed, as is usual, to milch cows. In the test cows averaging 1,000 lbs. weight produced 24·4 lbs. annually for each 100 lbs. weight ; cows averaging 900 lbs. to 1,000 lbs. produced 37·4 lbs. per 100 lbs. live weight ; cows averaging 800 lbs. to 900 lbs. produced 39·4 lbs. per 100 lbs. live weight ; and cows averaging 700 lbs. to 800 lbs. produced 41·7 lbs. per 100 lbs. live weight. Taking the cows at 1,000 lbs., 950 lbs., 850 lbs., and 750 lbs. each respectively, the average yield for each cow in the several divisions would be 244 lbs., 355·3 lbs., 339·9 lbs., and 312·75 lbs. for the year.

Hand-rearing of Calves at Nel's Rust.

By Ergates.

MEETING Mr. Geo. D. Alexander a short time ago, we got into conversation about calf hand-rearing. The conversation ended in his inviting me to go out and have a look at the Nel's Rust calves. I went last week, and a lot of calves in better and more even condition I have never seen.

"How many calves are there, and what are the losses ?"

"There are fifty-nine, and one is dead, and that was really accidental. A few days ago it got away, during the run out for exercise, and ate some noxious plant, probably stramonium, which brought on gastro enteritis, and it died in a few hours. I am certain it was poisoned. I was a good deal vexed, because I had hopes of rearing a hundred without any loss whatever. But it must be remembered that accidents of this class occur under all circumstances, and that the hand-rearing work is done entirely by natives. I am seldom here (Meyer's Hoek homestead) more than a couple of days in the week. Please also remember that this is the season of the year that many stock-breeders say calves cannot be reared."

Before leaving I was fortunate enough to induce Mr. Alexander to promise to send the lecture he delivered at the last meeting of the Farmers' Conference to the *Journal* for publication. The lecture will be revised, and the points which have been found most open to discussion or calling for further elucidation will receive special attention.

The building and the plant of the Nel's Rust Creamery are about to be largely increased, and the steam power for the machinery will be substituted by water power, to be transmitted by electricity

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
A. B. Koo ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	F. R. Moor ...	Greystone.
		,,	F. Knapp ...	Klipfontein.
		,,	J. W. Moor ...	Moorleigh.
		,,	J. Oates ...	Oatsvale.
		,,	R. C. O'Neil ...	Hillgrove.
		,,	C. J. Labuscagne...	Haatsfontein.
		,,	B. J. Wilkes ...	Portington.
		,,	A. G. Harding ...	Marshlands.
		,,	Du Plessis & Cloete	Compensation.
		,,	J. Van der Merwe	Welgekoose.
		,,	A. Pretorius ..	Shypoort.
J. Button ...	Estcourt, South of Bushman's River	,,	C. W. Dennill. ...	Guadaloupe.
		,,	S. Nel ...	Wagon Drift.
		,,	C. B. Lloyd ...	Hidcote.
		,,	Geo. Gibson ...	Craignevin.
		,,	L. Schomann ...	Twyfelfontein.
		,,	S. Schomann ...	Willow Grange.
		,,	W. McFie ...	Highlands.
		,,	J. K. H. Miller ...	Beacon Hill.
		,,	H. E. Kirby ...	Klipfontein.
		,,	J. Marais ...	Malan Spruit
		,,	A. Lawrence ...	Grantleigh.
		,,	L. Berthon ...	Littlecote.
		,,	J. Chadwick ...	Howard.
A. H. Ball ...	Weenen ...	,,	C. J. Smythe ...	Stratherne.
		,,	W. Lotter ...	Doornkloof.
		,,	P Van Rooyen ...	Middleburg.
		,,	C. P. F. Van Rooyen	Mona.
		,,	P. M. Lotter ...	Waterfall.
		,,	S. C. Van Rooyen	Middleberg.
		,,	A. Hair	Oribee Vlakte
		Lungsickness	Maboko	Bushman's River Poort.
J. J. Hodson ...	Lion's River ...	Scab	J. J. Morton ...	Sherwood.
		,,	Mrs. F. McKenzie	Onverwacht.
		,,	W. L. Methley ...	Newstead.
E. J. B. Hosking ...	Upper Umkomanzi	,,	Jos Raw	Buffels Bosch.
R. J. Raw ...	Impendhle ...	,,	Wm. Watson ...	Minerva
		,,	R. Gresham ...	Castle Howard.
		,,	C. P. Speirs ...	Mount Park.
		,,	R. Ogram ...	Tilletudleni.
		,,	A. H. Lee ...	Inhluzani.
		,,	F. Knapp ...	Furth.
		,,	S. M. Snaw ...	Umgeni Poort.
W. Wilson	Polela	,,	C. W. Roberts ...	Ebrington.
		,,	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
		,,	R. C. Gold ...	Woodend.
		,,	R. M. Arbuckle ...	Costmore.
		,,	J. J. Van Dyke ...	Riverport.
		,,	J. Van der Merwe	Nooitgedacht.
		,,	S. Maritz ...	Maritzdale.
		,,	F. E. Peto ...	Clovelly.
		,,	H. Nicholson ...	Fondling.
		,,	H. C. Gold ...	Darnford & Greenend.

Stock Inspector.	District.	Disease.	Owner	Farm.
W. Wilson	Pole'a	Scab	J. Van Wykes ...	Epsom.
		,,	Caleni	Location.
		,,	J. Willson... ...	Stony Glen.
		,,	G. Houston ...	New Bigging.
C. E. Hancock ...	Ixopo ...	,,	W Gray ...	Helmsley.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	Pietermaritzburg Corporation ...	Sanitary Depôt.
		,,	J. Townsend ...	146, West Street, Pietermaritzburg.
		,,	T. Owen ...	9, Pietermaritz St.
		,,	P. H McCrystal...	11, ,,
		,,	F. Knapp	,,
		,,	Kamana	Sand Pits, Town Hill
		,,	H. H. Boden ...	The Knoll, Hilton Rd
J. A. Morrison ...	Durban & Umlazi	,,	P. Saville ...	Umzimbazi.
		,,	W. Pearce ...	Lower Illovo.
W. A. Hutchinson	Alfred ...	Scab	Nqubu ...	Location.
		,,	Makubana ...	Amaci Location.
		,,	J. Wessels ...	Sheepwalk.
		,,	Geletu Flentyi ...	Location
		,,	Inkubi and Duli ...	
		,,	C. J. Triegaart ...	The May.
		,,	Umhlenga	Mount Neho.
		Lungsickness	T. Groom, H. Clark, W. Simpson, P.W. Dept.	Ingeli Poort.
		,,	G. Blakeway	
		,,	F. Mainwearing	
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	,,	F. E. Zunckel ...	Rivulet.
		,,	Natives	Hongerspoort.
		,,	Wm. Zunckel and Umliezana	Wilhelmus Hohé
E. Varty ...	Umvoti, Western Portion	Scab	J. M Van Rooyen	Pompoennek.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	— Thompson ...	Marburg.
		,,	W. Clothier ...	Ultima Thule.
		,,	C. Mabai	Marburg.
		,,	C. Kaupar ...	,,
		,,	J. Malichi... ...	,,
		,,	H. Mason	Oakhurst.
A. S. Parkinson ...	New Hanover ...	Scab	Umshola & Makenke	Swaimana's Location

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

Rinderpest exists on farms Kirkintulloch, Kleinfontein, Hill Crest, Riet Kuil. and Reproach in Ladysmith Division , on farm Zandspruit in Upper Tugela Division ; in the Normandien District and Ingogo in the Newcastle Division ; on the farm Jammerdaal in the Kranskop Division ; and at three native kraals in the Nkandhla District, Zululand.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 31st December, 1901.

Dairy-breeds Competition.

IT may be remembered, says the writer of "Farm Notes" in the "Manchester Guardian," that what is described as a pan-American competition is taking place between the cattle of ten different dairy breeds at the American Exhibition which is now in progress. Details of the work performed by every animal in every herd, as well as of the collective herds, are published from week to week, and in one of the most practical of American newspapers devoted to the industry the herds are in several cases illustrated by photographs taken on the exhibition grounds. (The writer, unfortunately, does not state on what the profit is based —milk, butter, or cheese.) With regard to the other animals it may be mentioned that on the last date to hand—September 17th—the greatest profit had been shown by the Guernsey cattle, followed by the Jerseys with second place, by the Ayrshires with third place, the Dutch coming fourth, the Red Polls fifth, next the Swiss, the French Canadian, and, last but one, the Shorthorns and the Polled Jerseys, which are practically bracketed together. Thus the Shorthorns take the last place but one. What is the reason of this? When we come to the quantity of milk produced we find the Dutch cattle an easy first, followed by the Ayrshires and the Swiss, and then by the Red Polls, the Guernseys, and the Jerseys, Shorthorns here taking seventh place. In a word, they were beaten by every recognised breed, for the remaining three varieties, the French Canadian, the Dutch Belted, and the Polled Jerseys, are but modern and manufactured varieties, if such they can be termed at all. If we examine the quality of the milk we find again that the Shorthorn is at fault, for it still takes only seventh place. The next question which arises in order to ascertain the causes of the various positions of the breeds is that relating to the cost of the food consumed, and here we find that the Shorthorns stand at the top, which practically means the bottom, for they cost more than any other cattle, although the Dutch are but a fraction behind them. The Ayrshires—much smaller—produced a great deal more milk as well as a great deal more fat, and cost infinitely less to feed; but it is well to note that the three fancy breeds to which I have referred cost the least to feed. I regard this fact as of considerable importance, for it indicates—what I have already desired to impress upon the reader—that there is a distinct relationship between the quantity of produce given by an animal and the food she eats. A big producer must of necessity be a big feeder, and it would appear once more that a small producer is a small feeder, although this is not a case of necessity. It is, of course, still possible for the Shorthorns to take a higher position before the competition closes. The figures I have supplied cover the time between the 1st of May and the 17th of September, but during the last week, that ending at the latter date, the Shorthorns had risen to the second place in the production of milk, and had improved their position in the quantity of butter fat they had yielded. Further, the Holsteins had commenced to cost more for food, thus giving the Shorthorn the second place. In spite of these advantages the Shorthorn held only the sixth place from the point of view of net profit, and after all that is the point which the practical farmer considers. We have never attempted to emulate the Americans in competitions of this kind, and I regret that not only are they cheaply held by those concerned in this country, but the American tests are either ridiculed or ignored by those who ought to know better, and who should be the first to admit our own shortcomings and the necessity for following the example of the more practical leaders of the American dairy cattle-breeding industry.

Evidence of the close inspection to which London's meat supply is subjected appears in the annual report of the city health authorities, who state that 962 tons of beef, mutton, and other descriptions of meat were condemned as unfit for food last year. Of the total supply that passed through the market, amounting to 410,380 tons, America contributed 23·2, Australia and New Zealand 21·9, and other outside places 15·1 per cent.

Cattle Dipping Tests.

By P. R. Gordon, Chief Inspector of Stock, Queensland.

THE following is extracted from the "Queensland Agricultural Journal" for October, 1900 :—

"On 13th August, twenty-two cattle were put through a dip known as Quibell's Dip, the dipping being done under the personal supervision of Mr. A. E. Royle, the agent of the Proprietary. Ten of these belong to the Department, and the time occupied in passing through the dip was from five to nine seconds, actually swimming. The ten belonging to the Department were dipped at a strength of 1 part of the dip to 60 of water, and the remaining twelve were dipped at a strength of 1 in 80, and were kept in the dip for fully one minute. None of these cattle were heavily infested. This dip did not visibly injure the cattle in any way. The cattle were under daily observation and live ticks found on them for several days after dipping, but on close inspection on 23rd, ten days after dipping, no live ticks were found on them."

Accompanying the above was the following official letter :—

Live Stock and Brands Office,
Brisbane, 18th October, 1900.

Messrs. Quibell Bros., Ltd.,
12, Wool Exchange, Sydney.

Dear Sirs,—I am in receipt of your letter of 15th, and by this post send you six copies of my progress report on dipping tests, by which you will see that Quibell's Dip destroyed all the ticks on the cattle operated upon, although some time elapsed before they were finally destroyed. In justice, however, to your dip, it may be stated that the test was a severe one, inasmuch as the ticks on the cattle were in the larval stage, and consequently more tenacious of life than fully developed ones.

Yours truly,

(Signed) P. R. Gordon,

Co-operation v. Individualism.

THE following is a tabular statement of the enormous profits made by the co-operative butter factories of Victoria. It is said that although they have been very successful, they are not extending their business in nearly the same proportion as the private firms. Indeed, it is authoritatively stated that more than half of the butter factories and creameries in the State are either owned entirely or controlled by private firms. It would be disastrous to the milk-producer for either private firms or any but the widest co-operative factories to have a monopoly of the trade, as they could then beat him down to starvation prices for his milk. The following interesting table, just published, shows how great the profits of the co-operative butter factories are now, and it is to be hoped, for the benefit of the dairy farmers, that there will be a fairly even balance between the companies and the private owners, so that from healthy rivalry he may obtain fair prices for his produce :—

Company.	Paid-up Capital.	Net Profits	Period. Months.
	£	£	
Farnham	2,445	2 442	6
Glenormiston ...	4 350	3 338	6
Colac	4,936	3,844	6
Warrnambool ...	3,787	4 317	6
Glengarry	500	360	6
Geelong district ...	4,332	1,026	6
Kyneton	4,671	1,337	12
Kongwak	771	608	6
Yea	5,058	1,814	12
Poowong	2,0.5	922	6
Drik Drik	220	113	6
Wallace and District	2,787	542	12
Buninyong... ...	3,368	739	12
Koroit and Gower Hill	3 109	1,342	12
Miepoll	792	229	12
Tamlough and Karramous	1,368	636	12
Swanhill and Morngag	837	304	6
Strathbogie ...	480	192	12
Hamilton	2,995	450	6
Pyrami Hill ...	1,014	407	12
Framlingham and Elderslie	4,117	1,577	6

It will be noticed that these twenty-one companies' returns show a profit of about 42½ per cent. on the amount of capital

invested, and this much can probably not be said of another five businesses in the State.

Of factories and creameries there are in Victoria :—

	Factories.	Creameries
Co operative Companies ...	116	270
Proprietary Companies ...	33	60
Private Firms	89	42
	238	372

Shorthorn Recollections.

"JAVELIN," in the "Live Stock Journal" writes :—

Mr. William Torr, so widely known as Torr of Aylesby, was one of the best farmers and one of the greatest breeders of Shorthorns that ever lived in England. He was a born judge in the same sense as we say that a poet is born, not made. He was liberal in his views, catholic in his tastes ; he began to breed, and for a long time pursued his course as a breeder, before there was any fashion, such as became in later times so severely manifested and so powerful. He knew good cattle when he saw them, and being entirely free from bigotry and the prejudices belonging to it which warp men's judgment, he collected the foundations of his herd and made additions to it subsequently, according to the best of his lights. He arrived at conclusions upon what he considered sound and sufficient data, and once he formed his opinion he could not be shaken. He was, in a word, a pre-eminently strong man. His energy was enormous, and his spirit masterful, if not despotic.

As a judge at the great shows in the three kingdoms, his services were greatly in request. He quickly made up his mind, after due examination, as to the merits of the animals placed before him in the ring, and his decisions upon them, once formed, were never altered by his colleagues when they happened to differ from him. At an early date he strongly admired cattle of Booth blood, and in the 'forties he considered that Mr. John Booth's herd at Killerby was, beyond question, the best small herd in England. He was, however, a strong admirer of Mr. Bates's strains, and while he regarded Mr. John Booth's Bracelet as the best cow he ever saw, he placed Mr. Bates's Duke of Northumberland in the same lofty position among bulls. He purchased one of the Kirklevington Waterloos to found a tribe at Aylesby, and this tribe he held to the last in high esteem. Many Royal winners issued from the Aylesby Waterloos when shown by Lord Polwarth, Mr. Beattie, of Newbie, and others. A Booth tribe, that of the Studley Old Anna, came to Aylesby in the person of the handsome cow Rennet, which Mr. Torr purchased very cheaply at Mr. Marjoribank's sale in consequence of her being lame. Mr. Harvey Coombe offered him on the evening after the sale double the price he had paid for her. She was the foundress of the great Riby tribe which became so famous.

When staying with Mr. Torr in the early 'seventies, he, in the kindest manner, gave me a great deal of information acquired by his long and distinguished experience, and plainly showed me that he was not a bigot as to pedigree. He felt bound, however, to admit that he thought it prudent to cater, to some extent, to the fashion ; but nothing could induce him to buy or to use in his herd an animal which he thought a "wrong one." He spoke in very high terms of the grand animals which he saw in Mr. Bates's herd, and said that that gentleman's cattle were, at the time of his death, of great merit. He mentioned that he was very anxious to buy Duchess 55th at the sale held after Mr. Bates's decease. Mr. Richard Booth and he went there with the intention of buying that cow in partnership, of going halves, so to speak. Mr. Booth, however, considered that Duchess 55th was a doubtful breeder, and accordingly they did not bid for her. This opinion proved erroneous, as she afterwards bred, and Mr. Torr expressed himself as very sorry that they had lost her.

At this time Mr. Torr was quite vigorous, and held on to his habit of giving orders from his bedroom window at the dawn of every morning. I may add that the time was winter and during February snows He little thought that his life was so near to its close, and that the September of 1875 would witness the dispersion of the great herd, the result of his long and arduous labours. He did not foresee that his herd was to be so highly valued by the breeding public of the Shorthorn world as to realise the great sum which represented the total achieved on that eventful day. Had he lived to be present he would have seen that Shorthorns had not been unprofitable. Colonel Tomline, the owner of the estate, kindly lent Riby Hall to Mr. John Torr, M.P. for Lievrpool, brother of Mr. William Torr, for the sale, which was conducted by Mr. Thornton. This enabled the member for Liverpool to entertain a large company of some thirty breeders, comprising the *élite* of the Booth party and a few leading Bates' supporters. A very large company assembled around the sale ring, the number being estimated at 1,500, and excitement ran high. The biddings were often furious, and money appeared to be of little value in the minds of the bidders; the favourite animals were to be secured at, as it seemed at the moment, any price. For several of the heifers, as soon as they entered the ring, the opening bid was 1,000 gns. each. A superb cow of the Flower tribe, Mountain Flower, fell to the Rev. Thomas Staniforth at 1,500 gns., and her beautiful daughter, Heather Flower, accompanied her to Storrs Hall at 1,000 gns. A wealthy and very handsome heifer of the Studley Anna sort, named Riby Empress, went at 2,100 gns. to Mr. T. C. Booth, of Warlaby, amid much cheering for the man and his old historic home. Several of the Brights, also descendants of the Studley Anna by Pilot 496, made very high prices to go to Warlaby, which was enriched by a dozen females from this great Aylesby collection. For the lovely rich roan heifer calf Riby Marchioness Mr. Talbot Crosbie, of county Kerry, paid over £1,300. He did not intend to pay so large a price for this youngster, but he had bid for many lots and had been left hopelessly behind, and now he determined to secure one Riby, cost what she might, for this was the great and memorable dispersion sale of the herd of a most illustrous breeder—there could be no recurrence of the event.

The sale was in one respect quite unique, inasmuch as everything offered was bred on the farm by the late owner.

The average for eighty head was over £500 apiece, and the grand total exceeded £42,000.

Such was the result of the greatest, the most successful sale Shorthorns of Booth blood ever held in the world.

The Proportions of a Horse.

IN an address on the symmetry of horses, Mr. R. A. Ramsay, an American veterinarian, quoted from the authority *Borngelat* the following rules, which, in general way, constitute the foundation of the symmetrical proportions. The head is taken as the standard of measurement:

"1. Three and a half geometrical lengths of the head give the entire height of the horse, counting from the top of the forelock to the ground upon which he stands, provided the head is well carried.

"2. Three lengths of the head equal the height of the body from the top of the withers to the ground; the length of the same body from point of shoulder to the point of the buttock inclusive.

"3. A whole head gives the length of the neck from the summit of the withers to the posterior part of the poll, measuring in a straight line; the height of the shoulders, from the top of the withers to the point of the elbow; the thickness of the body, from the middle of the abdomen to the middle of the back; the width of the body, from one side to the other."

Mr. E. Warwick, 310, Bulwer Street, states that he has used glycerinated bile up to six months old with good effect. In the seventh month it lost its colour, and he threw it away.

According to Professor Blundell, of the Royal Agricultural College, the pig, if properly managed, will do most towards paying the rent, and he recommends farmers to keep as many as possible. The average life of a bacon pig of the size now required is 30 weeks, while that of a sheep is 60 weeks. If well bred, and fed with suitable food, the pig will increase from 10lb. to 11lb. per week. For that increase he will require from 5lb. to 5½lb of dry food per day.

American Dairy Cow Trials.

THE following is extracted from the "Manchester Guardian":—

The Buffalo dairy cow trials have concluded. They are the most remarkable in the history of milk and butter trials, inasmuch as five cows of each of ten breeds have been under trial for six months and details carefully tabulated. Dismissing the three native breeds, we have seven varieties, five of which are the chief English dairy breeds, the other two being the brown Swiss and the Dutch. The result is that, from the point of view of profit, the Guernseys have taken the first place as butter-makers; while the Dutch occupy a similar position as the producers of the largest yield of milk, the largest weight of total solids, and the greatest profit on the basis of total solids in the milk and increase in weight of carcase combined. The only position obtained by the Shorthorn is that the cows gained more than double the weight that was gained by the cows of any other breed, and this is precisely what was not required. The five Dutch cows gave nearly 4,000 gallons of milk, the Ayrshires following with 3,300, and the Shorthorns with nearly 3,200. The poorest milk was the Dutch with 3·25 per cent. of fat, the richest was that of the Jerseys and Guernseys with 4·6; the Red Polls gave 3·98, and the other breeds 3·6. The actual weight of fat as of butter, both estimated by calculation and obtained by the churn, was credited to the Dutch, and it was only because the Dutch cows cost so much more to feed than the Jerseys and Guernseys that they were beaten. The most costly cows to feed were the Dutch, closely followed by the Shorthorns, the other breeds costing very much less. Practically, then, the special butter-making breeds are the most economical in the use of their food, for whether as butter-makers or total solid producers the whole lot beat the shorthorns, which had to give way to every other British breed, whether as regards butter or total solids, and it was only the increase in weight made by the Shorthorn cows that gave them the third position in the final question of profit, not as regards butter, but as regards the combined value of the total solids and beef. Many efforts have been made of late to prove that the Shorthorn —I speak of the pure or pedigree breed— is a first-class dairy cow, but I suppose every Cheshire farmer (to take a body of men who know something of the subject) would agree that the pedigree Shorthorn is not adapted to his particular work, namely the production of milk for cheese-making; and assuredly the butter-making farmer would be still less likely to adopt this great national beef-making breed. The aristocracy of the cattle breeding interest, however, do not take the same view, and therefore the lesson of the American trials will probably be lost upon them, for if the cows were fed upon the same foods that lesson is of enormous national value.

"College Green."

MR. P. D. SIMMONS, Natal Stud, has obtained "College Green" for the season. He is a chestnut blood horse, foaled 1891; got by "Baliol," dam "Village Green" by "Tom Moor," etc. See Stud Book, Vol. XVII., page, 797. He has won good races with big weights.

Nottingham Maiden National Hunt Flat Race, 2 miles, carrying 12st. 7lbs.

Salford Hurdle Race, 2 miles, 11st. 8lbs.

Badnott National Hunt, 2 miles, 12st. 12lbs.

Border Handicap Hurdle Race, 2 miles, 11st. 8lbs.

Ruthven N.H. Flat Race, 2 miles, 11st.

Welbeck Handicap Hurdle Race, 2 miles, 12st. 5lb.

A German professor, named Behring, winner of the Nobel prize for medicine, announces that he has proved the possibility of rendering cattle immune to tuberculosis by inoculation. He has declared his intention of employing the money gained by the Nobel prize in putting the treatment into practice.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—"Ring out the false, ring in the true," is a sentiment which doubtless will find an echo in many a heart now that 1901 has joined the great majority. Those in business who had to contend with difficulties and drawbacks when the war commenced in 1899, never for one moment dreamt that two years afterwards we should be confronting much the same state of affairs. It is freely asserted that it is far more difficult to transact business now, when the war is supposed to be virtually at an end, than it was at its commencement. Trade is very far from healthy, but "it is a long lane that has no turning," and it is to be sincerely hoped that before the dawn of another year South Africa will have assumed its position prior to the war.

Mealies.—Grain is a little easier than it was a fortnight back, and good samples are being purchased at from 11s. 6d. to 12s. per muid; some samples, we are told (but they have not come our way), have been purchased at 8s. 6d. and 9s. 6d. per muid.

Forage. From 5s. to 7s. 6d. and 12s. 3d. per 100 lbs.

Hay.—About 2s. 6d. per 100 lbs.; bedding, from 7s. 6d. to 21s. 6d. per load.

Potatoes.—We have never known such a drop in tubers as we have experienced this last few weeks; fair samples have been as low as 3s. 6d. and 4s. 6d. per 100 lbs., very few samples going over 7s. per 100lbs.

Mabele.—This grain is still plentiful, but good samples have sold at an average of about 7s. 6d. per 100 lbs.

Tobacco.—From 10½d. to 1s. 2½d. per lb.

Onions.—From 9s. to 14s. 3d. per 100lbs.

Beans.—About 12s. per 100 lbs.

Poultry.—Fowls from 1s 9d. to 5s. 3d. each; ducks from 5s. 9d. to 11s. 3d. per pair; geese from 6s. to 8s. each; turkeys from 8s. to 25s. each; guinea fowls, 10s. per pair.

Butter. From 9d. to 10d. per lb.

Eggs.—From 1s. 3d to 3s. 3d. per doz.

Sundries.—Mutton from 5d. to 8½d. per lb.; bacon from 5d. to 8d. per lb.; ham from 6d. to 10d. per lb.; rabbits, 9d each; fish, 9d. to 3s. each; wheat, 10s. 9d. per 100lbs.

Vegetables.—Beans, beet, cabbages, carrots, cucumbers, lettuce, marrows, turnips, peas, rhubarb, and tomatoes.

Fruit.—Apples, bananas, oranges, pineapples, strawberries, and papaws.

Firewood. From 3d. to 7d., 9d., and 1s. 1½d. per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Business is fairly brisk, but by no means unusually so for this time of the year. Complaints are loud and deep respecting the inability of the railway to cope with trade requirements, and the block at the Port is something to be seen!

Mealies. The market is dull to a degree, and there appears to be little prospect of improvement. Quotations rule about 12s. 6d. muid, with an enquiry for parcels. The season, so far, is grand, and should it keep up the crop will prove another record.

Potatoes.—The crop now being reaped is the heaviest ever known, and farmers are jubilant. Prices are anyhow, but at the same time all really good samples bring their price, which may be said to represent 13s. to 14s. per bag top price.

Forage.—Considerable quantities are on offer at various rates, but the Durban demand is inconsiderable, owing to large importations of lucerne, compressed fodder, etc. Seeds of all kinds in demand, but local supplies are comparatively nil.

General Murdoch Smith used to tell a curious sheep-stealing story of a dog belonging to a friend of his at Chatham. He was a fine retriever, who, unfortunately, developed the vice of sheep-worrying. One night his master caught him almost in the act, and gave him the merciless thrashing he deserved. The dog disappeared after it, and next morning presented himself at his owner's house, wagging his tail and evidently highly pleased with himself. His master made much of him, but on going out a few minutes later was horrified to find a dead lamb on his doorstep. The dog's idea clearly was that he had been beaten for not retrieving the sheep he had killed before, and was anxious to put himself right in his owner's eyes.

The reason why Denmark has so rapidly jumped in o prosperity in the butter-making industry lies in the fact that all dairies have been regularly visited by dairy instructors, who also act officially as dairy inspectors. These men are not regarded by the farmers as tyrannical inquisitors, but rather as benefactors. Many of these travelling instructors are Government officials; but each of the principal factors maintains its own inspector and instructor, who regularly visit the "patrons," inspect everything about the dairy farms, advises in respect to feeding the stock, watches the health of the animals, direct how they are to be treated, and has power to insist that his directions are obeyed. It is very rarely that he has to put his "powers" into force, because everyone recognises the fact that all the advice offered and every direction given is distinctly for the advantage of the people to whom the advice and directions are given.

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AND MINING RECORD.

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CONTENTS.

Rinderpest.

(*Continued.*)

BY H. WATKINS-PITCHFORD, F.R.C.V.S., Director Veterinary Department.

THE importance, from an economic point of view, of utilising every available bile is obvious. At best the method is open to the objection of being the most costly of any of the methods of disease-prevention known to science.

It is often a matter of impossibility to gauge with any degree of exactitude the amount of bile obtainable from a given number of animals. This variability is dependent upon such causes as the rapidity with which the individual beast succumbs to the disease; disorganization of liver-function, and diminution of bile-secretion, naturally depending upon the duration of the malady, the facilities for obtaining succulent and appetising food which will stimulate the digestive secretions, free access to water, etc., as well as the more obvious causes of variation consequent upon age, development, etc. Even where a certain number of animals are artifically infected and set aside for the purpose of bile-production, it is a matter of difficulty to estimate the yield with accuracy. As a practical working rule during the last outbreak, it was found that 5 per cent. of

a herd would have to be sacrificed in order to furnish inoculative material for the remaining 95 animals. This proportion is being observed at present in the Cape Colony, and also in Natal, and is found to be about sufficient to adjust the variation of yield as above. As the amount of bile necessary for the effective immunisation of an animal is from 20 to 25 centimeters (10 for the first and 10-15 for the second), it will be seen, on the above computation, that the yield of useful bile from each animal averages about 400 to 500 c.c.m. This is probably near the mark, for although we frequently meet with small and useless galls upon opening a beast, we sometimes find distended and fully developed gall-bladders containing more than double the above quantity.

It will thus be seen that the bile method of immunisation can only be applied at a cost of one animal in every twenty to be protected. This must be a serious economic consideration where it is necessary, generally, to adopt such preventive measures throughout the length and breadth of the land. If a permanent degree of immunity could be purchased at such a price, the sacrifice might be made more readily, but if there exists the possibility of the disease levying upon the horned stock of the Colony a periodical toll of 5 per cent., the question becomes more serious.

We cannot rely upon the immunity conferred by bile standing us in good stead for future outbreaks of the disease, and only the improvident and sanguine man will seriously entertain the improbability of non-recurrence in the future, or found his hope of escape upon the efficiency of our State machinery for suppression. Rinderpest laughs at restrictions, and the future holds no certain warranty against recurrence.

In considering the practical application of the method, it is noticed that a definite relation seems to exist between the dose or quantity of the bile injected, and the degree of the immunity conferred. The dose of 10 c.c.m. has been decided upon as being the least practicable dose which will prove efficacious. Smaller doses of bile permit the disease to establish a foothold to a greater or less degree, and it has been found by experiment that animals receiving 5 c.c.m. or less are unable to resist a fatal attack when injected subsequently with virulent blood. If the degree of immunity bears a definite relation to the amount of the injection—as it thus seems to do—a stronger and more permanent immunity will be conferred by a larger dose of bile than 10 c.c.m., though the immunity produced by even a large injection of bile would never probably equal the permanency of an "active" immunity, such as is enjoyed by the animal surviving an actual attack of disease. Even if this immunity were approached, the wide application of such a principle would become impossible for economic reasons.

The double injection of bile, now so generally adopted, has several points in its favour. It is improbable that the same beneficial effects would follow a single injection of a quantity equal to the sum of the double injection.

It is indeed reasonable to suppose that the immunity obtainable by five successive injections of five centimeters of bile at definite intervals, would exceed the immunity acquired by a single dose of 25 centimeters. The most obvious advantage claimed for the double injection, however, seems to be that by the first dose of glycerinated bile, the animal is enabled to withstand a subsequent dose of pure or undiluted bile without incurring any risk of contracting the disease through its injection. By this means it is claimed that the bile system is rendered absolutely devoid of risk of spreading the disease, and there is no evidence to challenge or refute so important a claim, and it cannot be denied that by the second dose of pure bile, the frail immunity of the first glycerinated injection is confirmed and strengthened.

One of the most important modifications of this system is the attempt to produce from the passive or temporary immunity produced by bile, a form of permanent or active immunity by the introduction into the animal's system of the actual contagion of the disease. This, as will be seen, is an important point, although the objection to its adoption can be understood, particularly where the degree of the immunity conferred by the bile cannot be estimated.

(To be continued.)

India Rubber from Zululand.

ON page 579 of the issue dated Nov. 22, 1901, particulars were given of tests of India Rubber from Zululand, by Professor Dunstan. Some time ago the Minister of Agriculture was favoured with a visit from Mr. Hart, whose brother is a Rubber broker in London, and, on showing Mr. Hart a specimen of the same Rubber as that sent to Professor Dunstan, he kindly offered to send some to his brother in London, not saying where it came from, and ask his opinion as to its value. The reply received from his brother is to the effect that the Rubber, according to the sample sent, was worth at current rates 3s. to 3s. 1d. per lb. if gathered in the same clean condition as the sample sent. Mr. Hart's brother found the sample sent to be exceptionally clean, and stated that, if the little bark which was in it were kept out, it would be quite pure, and perhaps bring 1d. per lb. extra for its cleanliness. The Rubber was, he stated, of exactly the same quality as fine Mozambique spools or sausages; and, if wound on a small twig, and the resulting sausage cut open and the twig extracted, would be sold in London on the same footing. If the Rubber could not be so gathered, it should, stated Mr. Hart, be made up into small balls about the size of fairly large marbles, and be kept pure and gathered quite dry. Both kinds could be readily sold.

District Reports.

INGWAVUMA, 3rd December.—At the beginning of the month the weather was intensely hot, with dry winds from the north, but towards the middle of the month it changed, and we had fairly good rains. It rained on 8 days. The mealies which had been burned by the hot and dry winds at the beginning of the month have recovered their natural colour, and are now looking well. The Natives are still planting, and if the rains are favourable will continue doing so until the end of January. Lungsickness appears to have almost died out, and with the exception of a couple of kraals, where they each have about four head of cattle, the District is free of it. The natives in Portuguese territory, and also in this division, are great traders, and are continually going to Southern Zululand with cat skins, monkey skins, etc., to trade for cattle, and if Rinderpest should come this way it no doubt will be introduced by these people.

H. R. HELLETT, Acting Magistrate.

IXOPO, 11th January.—The weather has been all that could be desired as far as crops are concerned, as rain has fallen for a considerable period every day. Mealie and other crops look well, especially the millet, or maduna. Stock of all kind is thriving, and I have had less complaints of sheep losses during the past fortnight. The meeting to decide whether this Magistracy is to be brought under the Grass Burning Act, viz, 31 of 1895, is to be held here at 10 a.m., on Saturday, the 18th instant.

FRANK E. FOXON, Magistrate.

LOWER UMFOLOZI, 2nd January.—Excessive heat was experienced during the past month. Rain fell on eleven occasions. Two severe hurricanes blew over the Magistracy on the 9th and 21st respectively, both followed by rain. Three local thunderstorms occurred; still nothing in the way of a useful rainfall took place until the 30th and 31st, when several ploughs, laid by owing to interim drought, were speedily brought forth, and set to work preparatory to the planting of late crops. On the morning of the 2nd a suspected case of lungsickness was reported among Mr. Lofthe m's cattle at the Magistracy. The beast was at once isolated, and drenched on the suggestion of natives with some indigenous herb, and strange to say, on inspection the same evening was contentedly chewing the cud, and evincing every symptom of a healthy beast, which it duly turned out to be. On the 12th, however, a *bona fide* case of lungsickness, resulting in death, was reported by Mr. H. J. Dunn, of Patane Store, in one of four spans of oxen which conveyed goods thither for him. Necessary action was taken to prevent the disease spreading, with the result that no fresh outbreak has occurred during the past three weeks. The mabele crop now holds its own against the mealie, particularly between the Okula and Utcleni streams, and flowering, and green eatable mealies are to be found in the Regent Magendo's (Sokula) location in the N.E. extremity of the District, along the coast. Several small swarms of "hoppers" (locusts) have been seen about; but owing to the greenness of the grass, and their diving in-

stinct when attacked, it is hard to know how to cope with them. Stock continues to do well. A young quagga was reported as having been killed and eaten by wild dogs; none of which latter, strange to say, have yet been killed by any Native or Natives in spite of the Government's promised award of £1 sterling a head.

A. R. R. TURNBULL, Magistrate.

NEWCASTLE, 31st December.—Before this reaches you we shall be into the New Year, and I would wish you and your numerous readers a year of prosperity as a set-off against the troubled past two years. So far as I am able to judge by reports from outlying parts of this district, farming operations, where it has been practicable to carry them on, have been fairly successful, and a good grain crop may be fairly expected. The fruit crop appears to be good, thanks to copious rains compared with the rainfall of the past five years. I am unable to give the registered rainfall, but it has exceeded the average. Some hot days have been experienced, the thermometer reaching 95 in the shade. Apart from lungsickness, stock appears to have thriven well. The outbreak of rinderpest has not hitherto spread to other herds, and we indulge in the hope that with the large experience gained by our Veterinary Department, the disease will be held in check. The energetic Stock Inspector has his hands full at present. Labour is scarce and crime is prevalent, but the positions will be reversed with the advent of a more settled order of things.

J. O. JACKSON, Magistrate.

NQUTU, 2nd January.—During the past month we had a rainfall of 5·68 inches, which was well distributed throughout, and, as a result the crops are coming on capitally. There has been a deal of sickness amongst cattle during the month, such as gallsickness and lungsickness, and to add to the misfortunes of stock owners, rinderpest has made its appearance in the adjoining District of Nkandhla, and on the dividing line of the two Districts. Up to the present no outbreak of the disease has appeared in this District. So far I have heard of no cases of horsesickness though this is the season for it. The grass is in very good condition throughout the District, and all classes of stock are in first rate condition.

C. HIGNETT, Magistrate.

Weekly Rinderpest Report.

14TH JANUARY, 1902.

Ladysmith Division.

KIRKINTULLOCH.—No fresh cases among old infected troops. In the outbreak amongst natives cattle, reported last week, there have been four deaths and one fresh case.

Buys' Farm.—Military Stock: 105 sick animals, the great majority salting; ten fresh cases; three deaths. Buys' cattle: Twenty-one sick animals, eight deaths. Native stock: The disease exists at two kraals; one sick, four deaths. All the cattle on this farm have been inoculated.

Hillcrest.—Native kraal: No further deaths reported.

Swaartkloof and Doornkraal.—Outbreaks have occurred among native stock. Seven deaths on Swaartkloof, and two at Doornkraal. No animals at present sick. The cattle have been inoculated.

The outbreaks near Van Reenen's amongst natives' stock (Reproach, Brakwal, Underberg, etc.) are not spreading. There have been a total of Forty-two deaths. There are seven sick at present.

Newcastle Division.

Normandien Area.—There were two thousand head of cattle inoculated in this area. Up to date there have been one hundred and twelve deaths, twenty-one animals salted. There are fifteen sick now.

Gelefontein.—No fresh cases have occurred. Cattle have been inoculated.

Ingogo.—The disease exists at native kraals here.

Charlestown Town Lands.—Outbreak has occurred here.

Dundee Division.

The disease exists on the farms Goedgekloof and Babesay. Cattle have been inoculated.

Krantzkop Division.

Jammerdaal.—Four fresh cases, and one death.

Zululand.

The disease is still confined to a small area in the Nkandhla District. Six lots of native cattle are infected. Forty-three deaths are reported.

The Upper Tugela Division is now free from the disease.

It is slowly spreading in the Ladysmith and Newcastle Divisions.

S. B. WOOLLATT,
Principal Veterinary Surgeon.

14th January, 1902.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 19th February next :—

Pomeroy.—Three white goats and three kids. No marks.

Weenen.—One black cow, branded ∩ on right hip, swallow-tail both ears, lame in left front foot, with red heifer calf (about one month old), with white spots.

Estcourt.—Brown mare, nearly black (say dark brown), two white hind feet, stripe down face. Bay mare, black points, branded J.B. on right buttock. Brown mule, unbroken, two years old. Impounded by E. Peniston, of Moord Spruit. Bay filly, star on forehead, two hind feet white, and right front foot white, branded on left shoulder J3, tail cut square, branded left hip ⌊. Four goats still left in Pound not claimed, balance of 28 :—One black, white patch on head, white specks on body, right ear end cut off. One reddish white, left ear round hole in it. One reddish white, round hole left ear. One reddish white, round hole left ear, clip out of right ear. Impounded by H. D. Hulme, Greenford, near Ennersdale :—Roan stallion, age 3 years, branded J3 right hind leg, and on left hip WD, black points. Probable value, £3.

Richmond Road.—Bay pony gelding, appears to be blind in near eye, had on headstall and kneeband when impounded. Roan mare, under 14 hands, no brand or marks, also had on headstall when impounded.

Nqutu.—12 sheep. No marks or brands.

N'Konjeni.—Red-and-white cow, age five years, branded FR on left hind quarter.

Pietermaritzburg.—Grey gelding, height about 14 hands, aged, small piece out off ear, square cut tail, no brands.

Bile Notice.

UNDER Government Notice No. 506, of 1901, I hereby grant permission to all owners having stock in the Magisterial Division of Dundee, and in that portion of the Newcastle Division east of the Railway Line, to inoculate their cattle with bile. Owners should send to the Bile Station at Bester's Station or at Newcastle, where it is proposed to form a Bile Station at an early date, 5 per cent. of their cattle, such cattle to be between three and four years old, and in low condition if possible. Bile will then be issued to them free of charge for a double inoculation of their cattle. Owners wishing for a single inoculation only should send in 3 per cent. of their cattle. Owners not sending in 3 or 5 per cent. of their cattle will be charged 5s. per dose for such bile as the department can supply. There is only a limited supply of bile and serum at present. A charge of 2s. 6d. per dose is made for serum.

It is desirable that glycerinated bile be used—in any case for the first inoculation—as there will then be less danger of starting fresh centres of disease. Glycerine will be added to bile free of charge.

S. B. WOOLLATT,
Principal Veterinary Surgeon.

Principal Veterinary Surgeon's Office,
Pietermaritzburg, 4th January, 1902.

Judging at Shows.

THE following papers were submitted at the Conference of Pastoral and Agricultural Societies' Union of New South Wales :—

Mr. W. Muggeridge writes :—The principle upon which agricultural shows were founded aimed directly at the education of the producer. This principle is generally acknowledged, yet it has not been respected to an extent calculated to give the amount of benefit that was primarily intended. There has been no uniform system of schedule arrangement in regard to conditions; neither has the matter of judging to give educational results been accorded practical consideration. And it is of methods of judging I would speak.

Not being competent to deal with anything but the horse section I must confine my remarks to that department; but, they may, nevertheless in a measure be accepted as applying to show judging generally. The value of the agricultural show in advertising a district cannot be over-estimated, and where this is nourished as the main object the matter of educating the producer is oft times very much neglected. It may happen that in their desire to obtain big entries, and the consequent popularity, a show committee turns its back upon any suggested reform that may threaten a reduction of entries. For instance, in the horse section, if it were stipulated that no animal possessing an hereditary unsoundness should be eligible for decoration, the entries would, as a necessity, be much fewer than were no condition of the kind inserted in the schedule. With all due respect to the draught classes, it cannot be denied that we have mainly to rely upon the thoroughbred for the support of our horse-breeding industry. Of late years our light horses have shown deplorable bone deterioration, and few will oppose the assumption that our big racing institutions, by catering for the production of short distance flyers of the feather carrying pattern, have been almost entirely responsible for the growth of weak legs and light bone in our thoroughbreds. There is, however, another evil which, although greatly contributed to by this weakness of bone, is yet open to a measure of correction by show societies—that is unsoundness. If the schedule framers stoutly insisted that no horse possessing hereditary unsoundness should be awarded a prize, breeders would quickly assist by ousting from their studs animals that were calculated to produce any of the scheduled infirmities—that is the unsoundness which may be set down by an expert committee appointed by the Pastoral and Agricultural Societies' Union. In this connection it would be wise, perhaps, to have such a committee composed of qualified veterinary surgeons. A generally admitted difficulty is to procure competent judges, and were this great concern of the horse-breeding industry properly embraced by show societies it might even be necessary to subject judges to an examination as regards these hereditary unsoundnesses. I may be pardoned for traversing so much ground when dealing with the subject of judging, but I am eager to have discussed anything that may serve to advance the horse-breeding industry. Horse exhibits are incontestably the main feature of the show ring from a public point of view, and a retrospect of transactions in military horse-buying in this State during the past two years arouses great expectancy in regard to our future over-sea trade in horse-flesh. Leaving the war demand altogether out of the question, prices in the world's markets for horses of the right stamp offer great inducement for the production of export horses. New South Wales possess facilities unapproached by the favours bestowed by Nature on any other country in the world, and, as with our wool, we should be able to hold pride of place in horse production.

The influence of show judging on our industry in the past is difficult of estimation; yet, with such matters as the breeder may control, kept steadily in view by schedule committees in the future, the amount of benefit that would follow is easy to anticipate. The main thing, of course, is to educate the breeder; therefore it is absolutely necessary that judges should be prepared to give explicit

reasons in regard to how their verdicts may be arrived at.

The Muswellbrook Society—through the commendable persistance of their worthy president, Mr. R. T. Keys—has instituted a system that solicits reasons from the judges. These explanations of the judges are boldly displayed on the show ground beside the exhibits for the perusal of the public, and though this method of exposing the faults of exhibits naturally arouses the opposition of the owners of faulty animals, it is at least calculated to do credit to the principle which gave birth to the institution of agricultural shows. There is, of course, one big danger that menaces the permanent and general observance of the Muswellbrook method—and that is the selection of incompetent judges. Another possible impediment is the likelihood of small faults being exaggerated by stud-masters in decrying the infirmities of a beaten horse to the advertisement of victorious or non-exhibited animals. In spite of these opposing influences, the best means of imparting education should be consistently embraced if agricultural shows are to be raised to the pedestal that the architects of these institutions conceived.

To admit of this means of educating the producer being properly followed, there should be as few judges as possible appointed in each section. While I personally favour single judges, I do not presume to advance any contention in this particular, but it must be patent to all that one good judge might be easily secured, where it would be almost impossible to get three experts together at a country show. So that the influence of precedent might be guarded against, it would, perhaps, be wise to have fresh judges every year.

Whatever may be devised for the education of the producer the giving of instruction must devolve upon the judges.

Mr. John Lanagan writes:—I am of opinion that the time has arrived for all P. and A. Associations to move in the matter of obtaining paid expert judges; particularly in all stock classes.

Speaking from many years' experience, the present system of depending on judges who are asked to act, from various parts of the district, is unsatisfactory. And my reasons are as follows:—

(1) That the intention of shows is to educate the people. Under the present system of local or pick-up judges this has proved a failure. Many of the people accepting the position are incompetent, and when an award is made by them they cannot give their reasons for so doing. So that the public are left to decide why Smith's horse beat Brown's.

(2) If experts were employed they could give their reasons, in writing, or by word of mouth; which would assist the unsuccessful exhibitor in the breeding of his stock.

(3) Regarding the selection of judges, I think they should pass a careful examination before a board, consisting of three members, two of which should be practical stock-breeders, and the third should be the Government Veterinary Surgeon.

(4) I am a believer in single judges, and think that under this system competent men could be got—one taking all classes of horses on the ground; the same would apply for cattle, and I think would possibly work with sheep.

If this plan were adopted, it would assist in keeping down expenses; and I would suggest that judges be paid by the societies, say 5gs each, and 30s allowance for hotel accommodation, and in addition to this to pay coach fares.

The Government should give all judges a free railway pass when out on duty.

(5) Show dates should be fixed and shows so arranged that judges may group a considerable number in one trip. For instance, make Armidale the starting point; from thence to Glen Innes, Tenterfield, Inverell, Warialda, Moree, Narrabri, and Gunnedah, which would complete a number of the country shows up north.

(6) I am also of opinion that the Government should subsidise all shows using expert judges, to the extent of £ for £. Associations who refuse to avail themselves of experts should not be subsidised, to that extent.

During the siege of Paris upwards of 80 000 horses were eaten by the inhabitants of the city.

Durban Botanic Gardens.

THE Curator, Mr. J. Medley Wood, in his December report says:—In July, 1899, a correspondent in Pretoria obtained from us three stems of a species of Encephalartos, which was unknown to us. Of these one died, and the other two have now come into leaf, and prove to be E.cycadifolius, a very desirable species. These stems had been, as we were informed, lying in a store at Pretoria for some months. It is, therefore, three years or more since they were taken out of the ground, and only now have they commenced to grow again. I purchased on public sale six fruits of Lodoicea Seychellarum, the "double cocoanut," or "coco-de-mer," and hope that we may be able to rear one or more of them, though they are difficult plants to manage, and do not germinate for at least three years. We have no room for them under glass, and shall, therefore, plant them in the open ground. Whether our climate is sufficiently tropical for them is somewhat doubtful, but the experiment is worth trying.

Locust Report, Lower Tugela.

MR. STOCK INSPECTOR BROWN writes:—There have been no flying locusts for the whole of the month.

On the 11th December the locust eggs were hatched out at Darnall Estate and surrounding district, and in some places were very numerous.

In my report for November, I mentioned that locusts were dying from fungus on the Zululand side of the river. I see that they are still dying out.

I have sent some of the maggots to Mr. Fuller, the Government Entomologist, which I mentioned in my November report. These were found amongst locust eggs, and I think they are deposited by a brown fly something similar to the ordinary house fly, but a trifle larger.

Notice.

THE following are obtainable from the Laboratory, Maritzburg:—

	£	s.	d.
Pravaz syringes (about 1·5 c.c. capacity) each ...	0	7	6
10 c.c. springes, in metal case	0	10	6
M & M 10 c.c. syringes in case	1	0	0
Arnold's 10 c.c. syringe in case	1	10	0
Arnold's 100 c.c. syringe in case	3	0	0
5 c.c. quarter-evil syringe	1	10	0
Trocars and Cannulas ...	0	6	6
Quarter-evil vaccine, 10 dose packets	0	2	6
Snake bite serum, per dose	0	5	0
Diphtheria anti-toxin „ ...	0	5	0
Anti-tetanic serum, per dose	0	2	0
Anti-streptococcus serum, per dose	0	2	0
Mallein, per dose	0	1	6
Tuberculin „	0	1	6

Locust Fungus on application.

H. WATKINS-PITCHFORD,
Director Vet. Dept.

Grass Seed.

THE Department can still supply in small quantities the following grass seeds: — Guinea grass and Danthonia Semiannularis. Reference to the former will be found in No. 20, Vol. IV., and to the latter in No. 15, Vol. IV.

Indigo Cultivation.

The Views of Mr. J. G. COLENBRANDER and Mr. FRIEND ADDISON.

THE Minister of Agriculture wrote to Mr. J. G. Colenbrander, of New Guelderland, on the 11th of December last, informing him that the Natal Government had been approached by the Director of the Botanical Surveys of India, through the Government Emigration Agent for Natal at Calcutta, relative to samples of seed known as "Natal Indigo." He stated that he had been given to understand that Mr. Colenbrander had some knowledge of the plant in question, the cultivation of which, in India, had been found to be profitable

The Minister added that he should like to obtain all possible information respecting this plant, with a view to encouraging the growth thereof in the coast districts of Natal, and stated he would esteem it a favour if Mr. Colenbrander could afford him whatever information he might have on the subject, with a view to an article being published in the *Agricultural Journal*, calling attention to the matter.

Mr. Colenbrander replied as follows :—

New Guelderland,
18th December, 1901.

Sir,—In reply to yours of the 11th instant, I have pleasure in supplying you with what little information I have on the Natal Indigo plant, but am afraid that it is not enough to be of much assistance to you.

My father, the late T. C. Colenbrander, was for some time engaged in the cultivation and manufacture of Indigo at Pinetown, but failed to make it pay, owing, I believe, to the variable nature of the climate there. The plant, of which there are two known varieties, a coarse and fine, grows freely in a wild state all along the Natal coast, and is known to the natives as "paggembetu." It appears to thrive where there is much moisture, and springs up readily after being cut down. Some plants which are in my garden, and have been cut down several times, are now in splendid condition.

The seed of the fine variety is much sought after by Java indigo planters, and I have, off and on, collected for and supplied to them a considerable quantity.

The plant is known to most colonists, but for the benefit of those who are unacquainted with it, the following description may be of use :—

Indigo is a shrubby plant, and grows two to three feet high, with pinnate leaves, which have 7½ pairs of oblong, dull, bluish-green leaflets, not unlike lucerne. The plant likes a lot of rain, and, favoured with this, grows freely and throws out shoots rapidly on their being cut away. In about three months the plants begin to flower. The flower is pale red, and after flowering the plants can be cut down, when they soon shoot up again and yield a second cutting; sometimes they even yield a third in the same year.

With regard to the process of manufacture, I can only draw on my memory when still a boy, and cannot state whether any alkali or chemicals were used in the process. I remember that the leafy branches were used when fresh and green, not dried first.

Three cement basins or vats were built, adjacent to each other but on different levels. The topmost and largest basin was filled with the freshly cut Indigo; heavy wooden logs were placed on the top to press and fix it down, and clear water was then let into the basin to submerge the lot. In this state it was left the night or, say, 10 to 12 hours. Fermentation set up and a good deal of gas was disengaged, and the water became light green. This green liquor was run off into the second basin, which was smaller and at a lower level than the first. In this basin the liquor was violently agitated—the first basin being meanwhile re-filled with green Indigo. This agitation caused disintegration, and the green matter suspended in the liquor became blue and granular. When this operation was sufficiently advanced, the contents of the second basin were allowed to settle, and the sediment was then run into the third and smallest vat, which again was below the level of the second, and from which it was finally pumped into a copper boiler. The boiler was only just heated, and then allowed to stand for a

few hours, during which time the Indigo settled down, and as much clear water as possible was drawn off from the top.

The boiler was now again heated, and this time up to boiling point, after which its contents were allowed to run on a frame of wood lined with long cloth sheeting, where they remained to drain until about the consistence of very thick cream, when they were removed and subjected to considerable pressure, and when hard and dry – consistency of soap—were cut by brass wire on a frame into cubes of about three inches square. These were laid out so as not to touch each other on the shelves of the drying house. Finally the cakes were cleaned one by one, and tightly packed in boxes ready for the market.

I have been for a long time of opinion that some effort should be made to ascertain if the plant can be cultivated and manufactured in the Coast districts so as to make it remunerative.

Trusting this information may be of use to you,

I am, etc.,
T. G. COLENBRANDER.

Pietermaritzburg,
20th December, 1901.

Sir,—I propose publishing Mr. Colenbrander's letter in full, in the next issue of the *Agricultural Journal*, and should feel much obliged if you could supplement his letter with one from yourself, also for publication.

I have, etc.,
H. D. WINTER,
Minister of Agriculture.

J. MEDLEY WOOD, ESQ., A.L.S.,
Botanic Gardens, Berea,
Durban.

Berea, Durban,
21st December, 1901.

Sir,—By this evening's post I have received the papers on the Indigo question, and after reading Mr. Colenbrander's letter I think that, before writing on the matter as you suggest I should like to see specimens of the two varieties of Indigo plant said by him to be used, and should feel much obliged if you would kindly direct that he should be asked to send me specimens of each—the specimens should include leaves, flowers and pods, if possible, so that I may be able to decide whether they are separate species or mere varieties.

I have, etc.,
J. MEDLEY WOOD.

The Hon.
The MINISTER of AGRICULTURE.

New Guelderland,
24th December, 1901.

Sir,—In reply to yours of the 23rd, I shall have much pleasure in sending to Mr. Medley Wood a specimen of the plant I refer to in my article. As suggested by him the other is a mere variety. I cannot, however, send him leaf, flower and pod all at once, as the flowers are not due for two weeks, and the pods not until March.

Knowing that Col. Friend Addison had made some experiments in the culture and manufacture of Indigo, I asked him to put his experience in writing. I now enclose you the original notes he sent me, and which he has no objection to your publishing.

I have taken the liberty of adding a small note to his article.

I am, etc.,
T. G. COLENBRANDER.

The Hon.
The MINISTER OF AGRICULTURE.

Herwen, New Guelderland,
24th December, 1901.

The Indigo plant belongs to the order of leguminous plants, and very much resembles a small acacia. It is a papilionaceous plant with equally pinnated leaves. There are in Natal about 40 varieties of Indigofera. The greater number, however, do not contain indigotine. The only variety of any commercial value is *Indigofera tristis*. The plant is widely distributed all over the Colony, and in favourable seasons grows luxuriantly on the coast, midlands and uplands of Natal. I have noticed the plant in every part of the Colony I have visited. It is known to the natives as "Umpegambetu." The cultivation and manufacture of Indigo were tried in the early fifties by a Mr. Van Prehn at Pinetown; this gentleman giving up the venture after two or three unsuccessful seasons. I believe the

principal reason of failure was the frequent variations of temperature, which so affected the process of fermentation that it was impossible to get an even quality or yield, each day's produce varying in colour and yield. Since Mr. Van Prehn's experiment, little or no attempt has been made as regards the cultivation or manipulation of Indigo.

A few years ago one of my coolies remarked to me that the white people only planted tea and sugar. "Indigo" grows wild," he said, "all over the country. In my country large sums are expended in its cultivation; here it grows wild, and yet you do not make Indigo." On questioning the man, I found that he had worked in an Indigo factory in India, so I decided to make use of his knowledge, and to experiment with the wild Indigo. I used a 400 gallon copper clarifier as a steeping vat. I found that this would hold 400 lbs. of the plant, and would be large enough for the purposes of experiment. Four hundred lbs. of Indigo were placed in this vat, and compressed and weighted with stones; the water was then run in until within six inches of the brim. Within a few hours fermentation set in. As neither the Indian or I knew how long this should last, we had to carefully watch and guess when to run off the liquor. After a considerable time, and with many failures, I ascertained that the proper pitch of fermentation took place in about 12 hours. This varied almost every day, and some days 20 hours' steeping was necessary to extract the indigotine from the plant. The liquor at this stage had a slight greenish tinge, but, when examined in the light, the liquor was a light straw colour. The next process was to separate the dye from the water. This was done by heating and agitating the water with wooden paddles. After five hours' beating, small flake grains could be discerned in the water. The liquor was allowed to rest and the grains to settle. The water was then drawn off until only a blue solution or sediment remained. The blue sediment was then boiled to stop fermentation, and then run into a tray covered with fine calico. The water drained through the calico and left the dye in a thickish paste. This was then put into a press, and as much water extracted as possible. When the paste was solid enough to cut, it was cut into squares and placed in the shade to dry. It usually took about six weeks before these cakes were thoroughly dry. During drying the squares became covered with a white mould which could be brushed off when quite dry.

I made about 60 samples—some good, some bad. Ten of these samples I sent to Europe for report. The report was highly satisfactory, and the values placed on the various samples ranged from 10d. to 3s. 8d. per lb. Encouraged by this report, I decided to erect a small factory, and give the thing a fair trial. I planted 20 acres of Indigo, but, unfortunately, when this was 10 days old, a swarm of locusts settled on the field and destroyed the whole crop. I did not continue the venture. I have since ascertained that it is only in the earliest stages that locusts or any other insects eat Indigo. I planted a small plot in October, 1900. The following April this had reached eight feet in height. As it did not seed I cut it down in July. It is at present six feet high and just flowering. Indigo seed pods become brown in April, and the seed is then fit for collection. For cultivation of Indigo, the ground should be brought to as fine a tilth as possible; the seed should be sown in rows nine inches apart, and about three inches in the rows. Eight lbs. of seed will plant an acre. The seed germinates, and is above the ground in six days. The young plant is very delicate for five or six weeks. A hot wind or heavy rain will destroy the whole field. The land should be kept clean of weeds, and run through twice in the first six weeks. After this no weeds will grow, as the plant will have grown sufficiently to cover the land.

In five months the plant flowers, and it is in this stage that it should be cut and the indigotine extracted. A ratoon crop can be reaped in about four or five months. *Indigo tristis* when once established is very hardy, and I believe as many as ten cuttings can be obtained from one planting. I have plants in my garden which have been growing for at least six years.

The wild Indigo is found on any soil; but does not grow luxuriantly except in rich land.

This year I have sent several small parcels of seed to India, and I have at present orders for several hundreds of pounds. The present season has been a favourable one, and there is a promise of any quantity of seed in April next.

I found that 400 lbs. of plant gave from 8 to 12 ozs. of dry cake Indigo.

I am, etc.,

FRIEND ADDISON.

NOTE:—According to the foregoing, 25 lbs. of dry Indigo constitutes a fair return per acre. Taking the market value of Indigo at 3s. per lb., this only gives a return of 75s per acre. This, in my opin on, will not pay.

T. G. C.

24th December, 1901.

It will be seen from the foregoing correspondence that Mr. Medley Wood has kindly promised to supplement the information furnished by Mr. Colenbrander, and Col. Friend Addison, when he has received specimens of these Indigo plants. Mr. Medley Wood's article will appear in a future issue of the *Journal*.

Agricultural Chemistry for Beginners.

CHAPTER V.

By ARCHIBALD PEARCE.

PHOSPHORUS AND THE PHOSPHATES.

THE subject of this chapter is one of considerable complexity, and some parts of it will need rather careful attention; but on account of the large part played by the phosphates in the economy of both plant and animal life, and the many different forms in which they are found, it is often valuable to understand their constitution and peculiarities. Like nitrogen, phosphorus is not of great interest in its uncombined state; it is a yellow waxy solid, so inflammable that it has to be kept under water to prevent it catching fire spontaneously, and is chiefly used in the manufacture of matches. When it burns, which is, as we have learnt, only another way of saying when it combines with oxygen, it forms white clouds of phosphoric oxide, which is one of the acid-forming oxides, and is, therefore, sometimes called phosphoric anhydride. Making use of our previously gained knowledge of acids, we shall expect to find that this oxide combines with water to form an acid, and this is quite correct, for it rapidly dissolves in water, forming phosphoric acid. It would also be correct, following what has been said as to the formation of salts, to conclude that if the hydrogen of the acid is replaced by a metal we shall get a phosphate of that metal. But just here the complexity arises, for phosphoric oxide, in forming the corresponding acid, combines with three portions of water, and so it contains its hydrogen in three separate lots; and it is found that we can obtain three different phosphates, according as one, two, or three of the lots of hydrogen are replaced by the metal. As we shall be chiefly concerned with the phosphates of lime, which are more correctly known as the phosphates of calcium, since calcium is the true metal, and lime only its oxide, we will draw up a table showing the constitution of these three phosphates of lime or calcium, and the way they are connected with phosphoric acid. The acid may be represented thus:—

hydrogen	phosphorus
hydrogen	oxygen
hydrogen	

If one portion of the hydrogen be replaced by calcium, the compound becomes:—

calcium	phosphorus
hydrogen	oxygen
hydrogen	

This salt is the mono-calcic phosphate, that is to say, one-lime phosphate, and in

common language is called superphosphate or acid phosphate.

If two portions of hydrogen are replaced we get :—

calcium	phosphorus
calcium	oxygen
hydrogen	

and this is known as di-calcic phosphate, *i.e.*, two-lime phosphate, and as reduced or reverted phosphate.

If the whole of the hydrogen is replaced there will be :—

calcium	phosphorus
calcium	oxygen
calcium	

which is the tri-calcic or three-lime phosphate, bone phosphate or insoluble phosphate. For the purposes of these articles the correct chemical names will generally be used for the future, since the names themselves, if once understood, describe accurately which of the three forms is meant, and prevent confusion.

Tri-Calcic Phosphate.

Of these three phosphates the tri calcic must be considered the normal or natural form, since it is the one always formed when phosphoric acid and lime combine, providing, of course, that a sufficiency of the latter is present. It is found in bone, guanos, coprolites, and in various parts of the world in the shape of phosphatic rocks such as apatite, which are all classed as mineral phosphates, some of them containing as much as 80 or 90 per cent. of phosphate. Tri-calcic phosphate is practically insoluble in pure water, but readily dissolved by acids. If we burn a bone in an open fire, we shall find it converted into a white, brittle, and easily powdered mass, the animal matter having been burnt away, and though not pure phosphate, may be used to study its characteristics. If a small portion be powdered, and put into a glass with a little water, it will refuse to dissolve, but when a little hydrochloric acid is added, it will gradually dissolve to a nearly clear solution. Rain water, containing as it does some carbonic acid, slowly attacks and dissolves it, and the weak acids of plant roots have a similar power, the ease with which this solution takes place depending chiefly on the fineness of the powder. We all know that bone is an excellent manure, and it must, therefore, get dissolved somehow ; but we also know it is necessary to grind it to a fine dust, and that the finer it is the quicker it acts. Most guanos are naturally composed of extremely fine particles, and the substance is in a soft condition, and so easily attacked by the roots of plants ; but with mineral phosphates the case is different ; many of them are nearly as hard as glass, and although when finely—it must be very finely—ground, they act slowly as a fertiliser, they are little used in this form, owing to this very slowness. Even in the case of bones it is often noticed that they exert a fuller effect in the second and third year than in the year of application.

Bones.

As bones are so popular a manure they are worth a little special notice. All plants contain more or less phosphate, especially in the seed, and thus animals obtain in their food the amount required to form their bony frame. Clean dry bone contains about 57 per cent. of tri-calcic phosphate, 37 per cent. of animal matter similar to gelatine, and a little chalk, magnesium phosphate, etc. Ordinary fresh bone contains a considerable proportion of moisture, and in a sample of bone-dust we may expect to find 7 or 8 per cent. This moisture and other unavoidable impurities reduce the percentage of phosphate somewhat, so that a good average sample of bone-dust should give about 20 per cent. of phosphoric oxide and 25 per cent. of lime. The animal matter contains nitrogen, and this gives a further manurial value ; the amount is usually from 3½ to 4 per cent. Sometimes bone is steamed before grinding ; this removes a good deal of the animal matter, with its contained nitrogen, but renders the bone more easy to grind ; accordingly, steamed bone is a richer phosphatic fertiliser, but poorer in nitrogen, than raw bone. Bones are generally thought to give their best results on light soils, but even on clays they have proved a most useful manure. Various plans have been proposed for hastening their action by rotting or fermenting them ; one of the best is to mix raw bone with about a third of its weight of clay, moisten the mass with the urine of animals, and cover with a layer of moist clay two or three inches thick. The

heap must be protected from rain. In a few weeks the solubility of the bone is so much increased that it has been known in some cases to give as good results as twice as much of the raw material. The following are the percentages of the chief ingredients in two samples of colonial bone-dust analysed by the writer, and are given as an indication of what one ought to expect in ordinary commercial qualities :—

	No. 1.	No. 2.
Phosphoric oxide	19·72 p.c.	20·09 p.c.
Lime	24·95 „	26·42 „
Nitrogen ...	3·71 „	3·53 „

GUANO.

The well-known manure, guano, consists of the dried excrement of seabirds and is mentioned here because it usually contains a considerable proportion of tri-calcic phosphate, as well as small quantities of ammonium and potassium phosphates. It is found in several parts of the world, and varies much in composition according to the different conditions to which it has been exposed. In hot rainless countries it dries as fast as formed, with little change in composition ; but if exposed to rain the ammonia and nitrates formed in it by decomposition get washed out, and it becomes chiefly phosphatic, with a low percentage of nitrogen. This is well seen by comparing the percentages of phosphoric oxide and nitrogen in two kinds of guano commonly used in South Africa :

	Cape Guano	Natural Bird Guano.
Phosphoric oxide	8·53 p.c.	25·40 p.c.
Nitrogen	11·44 „	0·92 „

QUESTIONS.

1. How many kinds of calcium phosphate are there ? Give their names, and explain the difference in their composition.

2. What experiment would you make to illustrate the solubility of tri-calcic phosphate in acids ?

3. Where do animals get the phosphate that is found in their bones ?

4. Why are bones rather slow in acting as a manure, and mineral phosphates still slower ?

5. Describe a method of making bones act more quickly.

6. What is guano ? Why are not all guanos alike ?

7. What would you think of a sample of bone-dust manure which on analysis gave 15 per cent. of phosphoric oxide and 35 per cent. of lime ?

How My Gipsy Won the Cup.

MR. JAMES T. GODFREY, just emerging from his teens and invalided from the S.A.L.H., submits the following for publication. A valued correspondent says "he is a first-class horseman and is good all round." The account is natural and spirited :—

My Gipsy was a three-year-old, by Salvatore out of Merriewe, so she is not such bad stock, both dam and sire having won a few races in their time in the U.S.A. She was a chestnut with white stockings, a small head, arched neck, and a tail that hung like an Arab's.

I was to ride her the next day at ——— on the track to get her used to it, as she was entering on her first race, for fear of her getting too excited when with the other horses. I rode her with a few of her stable companions, and the more I rode her the more I liked her. On the race day there was a fearful clamour of the bookmakers' shoutings of two to one bar the field, etc. My Gipsy was an outsider in the betting as she had not run before.

At last the bell rang to saddle up, etc., and to get to the starting point so as to be ready for the start. The starter yells ready ! as the gates go up, and off we go, my Gipsy being second in the start. Belle is leading and the first round is coming to an end. With My Gipsy in the same place Belle is making the pace simply terrific. I hold My Gipsy in as we turn into the straight. There are only three horses in the race now. Towards the winning post Belle darts forward with a stripe from her rider. "Belle wins," is the shout from the stands. I touched My Gipsy, and as we pass the winning post she is a length to the good, and so we have won the cup.

P.S.—This happened in California, U.S.A., and in U.S.A. they have a gate for the starting post. It was my first win, and I must say one of the most exciting I have won.

Reminiscences of a Trek Ox.

By Vetpense.

ONCE, but it was a long time ago, and seems much longer, I was what is called a ripping little three-year-old; life had its charms then. I used to gambol about the veld, and fight with my brothers and cousins, much to the delight of our little herd-boy, Mcityo, who—although I hated him, because he used to have a nasty knack of laying his stick about my back if I had a pull at the milk bucket when he wasn't looking, or did not go straight into the kraal just when he wanted me to—always backed me. I suppose it was because I generally came off best.

My home was situated in a lovely little spot called Mid-Ilovu, about 40 miles from D'Urban, and most other places—as I thought subsequently, "far from the madding crowd" of staff officers, conductors, and Tommies. I used to go and look over the fences where my uncles and others were hard at it ploughing, and jeer at them, and ask them how they could be such "silly cuckoos" as to wander backwards and forwards, up and down a long furrow without even a *pat 'ntambo* (leader), it was such a joke. "Joke" did I say? That is a word I detest, and very seldom use, a word that is used by a driver when he is inspanning an ox, a corruption of yoke; and when he says "joke," it is either "joke" or no joke, the penalty for not putting one's head down in a humiliating manner, while he bashes the yoke down on your neck, being a violent kick in the ribs with his 4·7 boot, or a smack on the nose with a yokeskey, which is a piece of wood about fifteen inches long, two of them (these yokeskeys) going through each end of the yoke to keep it from slipping about on the oxen's necks, and are fastened underneath the throat with pieces of ox-hide, called neckstraps. (These explanations for imported Devons.) The yokeskey is generally made from the hardest wood obtainable, so you can fancy a blow on the nose with one of these makes one see fireflies innumerable, and, to add insult to injury, the blow is generally accompanied by the most insulting language imaginable, not referring to the recipient only, but to his ancestors.

I was an A1 jumper, one of the best over the wires. A three-strand barbed wire fence I have cleared with a standing jump, and consequently I was always getting into the mealies and sweet potatoes, not to say anything of winter forage, &c., &c.; but during rinderpest—which I survived, with several others, thanks to good serum and tender nursing by Masenga—Government fences were run up all over the place, and very nasty looking entanglements they are, which I know to my cost, having tried to clear one once, and having been hopelessly hung up on that occasion. I don't like Government fences.

At the age of four my troubles began. One day I was driven up to the cattle kraal with several other oxen, wondering to myself, "Why this honour?" Of course I had seen other individuals driven up in the same way, but you know what it is, I never realised that it would actually come to my turn one day. However *fata dies aderat*, and I soon saw what was on. Breaking in! There was the usual tree to drag along, there was the double riem for poor little me; and, worst of all, there was that terrible whip with a new piece of *vorslag* (brayed lash) on it. I dodged the riem two or three times, which the driver, old Msindo, was trying to pass over my horns, while that little brute Mcityo was laying on behind with his pet *nqnai* (a hard colonial wood) stick, to keep me from backing out of the line of oxen which were drawn up for inspanning. At last the double riem was on—such a horrid feeling—and I was paired off with old Entusi (a steady, plodding old "stick," who never thought of doing anything more vicious than attempting a tame cow-kick occasionally) as my companion in adversity. However, when it came to "joke," I thought it was

hardly good enough, so started plunging—gave young Mcityo one with my off-hind, and gave Msindo a gentle tap with my left defender, and away I went, stupidly thinking I had done them all down, but if so, it was only for a very brief period. I was chased for about two miles, and eventually brought back to the kraal and caught. I could see they meant business this time, as their manner was more determined, and they were calling me most peculiar names. Sufficient to say I was inspanned.

Old Entusi asked me why the deuce I had kept them all waiting an hour, and hinted that he would see me later on. Msindo then took up the whip and shouted "*Hamba*" (go on). The other oxen tried to start in a half-hearted kind of way, but I stood my ground. Down came the whip! What a cut it was. I asked Entusi to look and see if it was bleeding, but he only told me not to play the fool. "*Hamba*," for the second time; same result. It dawned on me that this was rather a poor game for me, so when I heard "*Hamba*" for the third time, I decided that it would be the third and last time of asking, and accordingly gave a desperate rush forward, pulling Entusi and the tree after me, and pushing the front oxen nearly on top of Mcityo; then I managed to get one leg over the trek chain, and stopped exhausted. Msindo used the butt end of his whip handle so vigorously on my leg that I had to draw it over the chain again. Then I lay down and wished I was dead. Msindo asked Mcityo if he had got a knife, and, thinking that they were going to cut my throat, I jumped up; but Entusi told me that it was only in case the neckstrap was choking me, as they did not want to run any risk of losing my future services, so I promptly lay down again. More thumps, insulting language, and double thonging, but I wouldn't budge. Eventually Msindo got some dry grass and lit a fire by my side. I got up slowly, telling Entusi that it was not on account of the fire, but because I thought he was getting hungry.

After this I behaved myself well, and heard the driver say, "*Ou! uya donsa gahle*" (by Jove! he pulls well). We dragged the wretched tree about a couple of miles and then turned back. I don't know what Msindo thought of my pulling powers then; probably he was too amazed and pumped to say anything. While we were being outspanned, would you believe it, that little sweep Mcityo suggested that I should have a trek chain tied round my neck before I was sent to graze, by way of taming me down. But, thank goodness, I was in the driver's good books, and he simply asked the boy what a mere child could know about breaking in oxen. I was very stiff and sore the next day, and consequently was bullied by one or two young brutes whom I could have held my own against when fit.

After being inspanned a few times more, and behaving myself fairly well, I was put aside as a model trek ox, and later on went in with a load of wattle bark to the city, and was as pleased with myself going down Church Street as a young subaltern when he "first puts his uniform on." The grazing was very bad, and there were rumours of that dreaded disease "lungsickness"; but I minded it not. Was I not one of a team of sixteen transport oxen! Entusi, I know, was smiling inwardly at my pride, and the way I kept a head in front of Dammelies (probably a corruption of Damocles) who was my half section on that auspicious occasion.

I was very much struck with the Madagascars, which I then saw for the first time. I tried to chum up with one at the Outspan, but Msindo had me turned back as he was afraid of lungsickness. I gave them a wide berth after that, but I was anxious to ask them how they managed to creep under fences with that big lump on their backs, and whether the expression "getting the hump" originated in Madagascar or not. But I daresay they might have felt insulted, allowing they could speak our language; another thing, they might have started chaffing Entusi about his stumpy tail. He had been through lungsickness and most oxen that get cured or "salted" generally go about the world without a tail, or with the faintest apology for one, and very often have big scars on the quarters as well. Saucepan, who was one of our oldest stagers said something about the reason the tail was cut was to produce a sort of counter-irritation. He

said, Sir, "When the attack is mild one foot in length is cut off; if severe another six inches, and so on, with one or two gashes in the quarter thrown in." He also told us that puff-adder poison is put in, which causes more irritation, but we wouldn't believe that, although Saucepan is not far wrong in his statements as a rule. I asked him how they would treat Manx cattle (which I had heard had no tails), but he changed the subject. Stumped, I thought.

However, to hark back to Entusi, he must have had a very severe attack, judging from what Saucepan had told us, and any reference to his stumpy tail was a signal for a violent outburst of temper. I shall never forget one day while we were outspanned about five miles from home, having been sent for a load of groceries, &c. We were fairly hungry, and were tucking into some sweet grass, when the local herd came along to have a gossip with us. One young steer about three years old came mooning along singing a snatch of some sailor song which his uncle had picked up during a trip to Durban—something about 'You swing your tail but you can't catch me, mind how you swing your tail," &c. Now, as bad luck would have it, he happened to be passing Entusi and gazing in his direction; I do not for one minute believe that it was in any way intended to be a cut at him. However, Entusi wheeled quarter-right and made one mad rush, knocking this unsuspecting youngster head over heels, and then poured out a tirade about insults, want of reverence, bad form with visitors, &c., &c., his stump twitching vigorously all the time, and his head very erect. Profuse apologies and attempted explanation of innocence only fanned the flames. Entusi finished up by saying that he hoped if *he* didn't lose his tail from lungsickness, some transport rider would twist it off for him for not pulling well enough. On another occasion a young wag passed Entusi, saying in a stage whisper, "Heads I win, and tails you lose." "You want me to toss you do you?" said Entusi, and he did.

I took a good many loads of produce into D'Urban and the City after this, and in my own estimation was about the best puller in the team; anyway, when the Boers invaded Natal, I was selected to form one of a span of sixteen to do work for the A.S.C. At first the novelty of the thing was rather nice and interesting. We went to the City and met a lot of pals, and made others. Our loads were light and our treks short, being generally from the Showyard to Fort Napier with kits for the Tommies. Our conductor appeared to be a very nice young man, but it seemed to strike us all that he had not lived among cattle all his life. We did not understand some of his words when he used to come riding along by the side of us with his hunting crop, and shouting, "Forward, forward, yohoy; gee up; get a move on; make 'em trot you black savage." Fortunately he could not ride with our wagon all the time, as there were several others under his supervision, so we were rather amused than otherwise when he did come along. But what we did object to was our grazing; at first it was passable, but after a time there was not a decent bite left, and we kept wondering when this Johnny was going to change our grazing. Things were getting pretty bad when fortunately Masenga came along. What exactly happened I do not know, but what I do know is that shortly afterwards we had a fresh grazing run and a new conductor. Beside this, one or two of our span who had been out of sorts for a short time were promptly sent off and fresh ones sent in their place.

Our span was now an extra good one, and I was very disappointed that we did not attract more notice as we marched through the streets; but no, what everyone used to gape at were spans of uniform colour. A black span, a red span, a khaki span—these they would go into raptures over, whereas we could have pulled them three times round the Market Square. But I will say this, that on one occasion when we were taking an extra heavy load up Longmarket Street, I heard an old transport rider, who was talking to a farmer friend of his, say, "Man, those oxen pull evenly; I wish I had ten spans like that." I thought to myself—Well, that from old ———— is worth more than all the sily exclamations made by an ignorant public over colour.

After a long spell at this, we eventually joined the Relief Column which was

working towards Ladysmith. Oh, those roads, and the weather we had, and the long hours; how we survived it I do not know. Very rarely we had a rest, and when we did get one, nasty remarks were made about lazy brutes, etc. It was during a rest that we experienced one of the most peculiar incidents of the war. We had had a day off, when an officer came riding along, halted, inspected us very carefully for about a minute, then called for our conductor. I had taken a dislike to him the moment he had ridden up, because he had a lot of red about his neck, and anything red puts our backs up at once; it seems to irritate us. I thought to myself: Thank goodness the British Army fights in khaki now, or a lot of us would be malkop (wrong in the head). However, up came the conductor, and was asked how long we had been resting "Two days, sir." "Have they been exercised this morning?" "Beg pardon, sir." Repeats the question. "No sir." "Why the blazes not? Tell the driver he must take them out exercising every day for two hours, and give them an occasional trot, and see that this is carried out until they start work again." "Yes sir." Now, what do you think of that: begrudging us our hard-earned rest, as if we did not get enough exercise hunting about for decent grass. However, it was an order, and we *were* exercised! But thank goodness, never again. This extraordinary performance was reported everywhere, until it came back to the same old "Someone had blundered." This was nearly as bad as the Remount Officer during the Afghan Campaign, who condemned the first batch of camels that were sent him on account of broken knees! So I have heard. I began to have a regular run of bad luck; for some reason or other I got into the driver's bad books, and he was constantly "going for me." I had heard that Dutch drivers always had a white ox in their span which they call Englishman, and whenever anything went wrong, or the wagon got stuck, Englishman got it hot; and *vice versa*, English transport-riders very often used to call their laziest ox Dutchman, and he was always "forrit." But I was certainly not lazy, nor was I called Dutchman (my name being Vetpense, by Vetboy—Sixpense) just one of the several misfortunes of war.

As winter came along we began to lose condition fast, and the weaker oxen were beginning to drop out during any long trek, so we were given lucerne, or oat hay (straw we called the latter), and we were issued a Government sleeping blanket. This covering certainly helped to ward off the cutting cold winds, but whenever it rained, we knew all about it the next day when we had to pull sixteen wet rugs in addition to the usually heavy load.

I must bring these lowings of the herd to a close. What broke our hearts in after months was convoy work, long treks with very little time for grazing, and (as the Governor of N. Carolina said to the Governor of S. Carolina) a long time between drinks. Up at 4 a.m., and inspanned, stand about until 5.30 a.m., then start, move a mile or two then halt, perhaps an outspan from 11 a.m. to 1 p.m., then on until dark, outspanned and tied up for the night. It was a marvel we didn't all die. No wonder nasty remarks were made by the Tommies every time we were driven up to be inspanned. "Them oxen 'as good points, and no beefstake about it." "'Ow's 'e for the cold storage, eh Bill? Guess we must 'ave had his mate for dinner to-day." "Look at them 'erring-gutted kangaroos." "'E's well trained any'ow; if you could get a lamp fixed up inside 'im on a dark night it would be a bit of all right." "Them's all right, but they could do with a good drink, I reckon." "Just struck me I hought ter 'a been a hartist; I fancy I could draw that there hox with a bit o' string." This was jolly for us wasn't it, having to listen to this outburst of wit every day, but they didn't mean to hurt our feelings. Tommy's all right, and is a good-hearted chap at bottom. I heard one say to himself after looking at us: "Poor 'arf starved devils, but I don't know how the war would have got along without 'em." But the Staff! I had heard all kinds of rumours in my early days, generally warning me to keep clear of the Staff, but I had always looked upon it in my imagination as a thick stick for walloping the after-oxen when no after-sjambok (a "persuader" made generally from buffalo hide) was

available, but I soon knew all about it. On a long trek when crossing a wide river, perhaps the conductor, who knew we had been without water all day would tell the drivers to allow us to halt for about half a minute, just to wet our whistles, up would come one of "the Staff," fuming, boiling, bubbling over, "Go on you blasted heathen. What the blank do you mean by halting the whole convoy." And often the end wagons of a long convoy would reach an Outspan an hour after the first batch, but the two hour's halt was timed from the arrival of the first, and consequently after about 40 minutes' grazing the oxen of the rear wagons would be driven up with the rest, inspanned, and perhaps wait for half an hour while the front wagons moved off. "Staff" was all we murmured.

I only once dropped out of the span and that was in Vryheid. We had been having cold rains and plenty of work ; I managed to stagger just pass the wire entanglements which surrounded the town, and then collapsed. I was at once outspanned and dragged to the side of the road and left. Fortunately a kind-hearted conductor had some lucerne placed close to me ; this, combined with a change for warmer weather, saved my life, and I was able to join the others, and go out grazing the following day. It was a narrow squeak ; perhaps what helped also to keep me from giving in was the fact that there was a sentry with a fixed bayonet on guard about fifty yards down the road, and I kept thinking he had designs on me with an eye for fresh meat. Well, enough. As Entusi is not by I must end this ox tale. I have only to add that I am still hauling away at biscuits and bully beef with the earnest hope that this state of affairs will shortly end, and enable me to get down to the sunny south once more.

Garden Notes for January.

By W. J. Bell, Florist and Seedsman.

KITCHEN GARDEN. — During this month the young plants of Cauliflower should be ready for planting out from the seed beds sown last month. The soil can scarcely be too rich for this crop. Plant out in rows three feet apart, and three feet apart in the rows for the large varieties, and two and a half feet for the smaller sorts. Advantage should be taken of cloudy or wet weather for the operation, so as to avoid the severe check caused when hot and dry weather follows immediately after planting, Should this, however, occur, a good plan is to shade each plant if possible with a few evergreen branches, or if these are not available a whisp of hay or grass tied round a stake inserted close to the plant. This may seem a troublesome performance, but if it is necessary it will pay, as if Cauliflower plants get a severe check they will never make fine heads, and it may also make a difference of several weeks in the maturing of the crop. Cauliflower and Brocoli seed may still be sown for a later crop. Brocoli is more suitable for the colder districts of the Colony, as it is more hardy. Early White Malta and White Cape are the best varieties for this climate.

In the up-country districts, Winter Cabbage, Savoy, Brussels Sprouts, and Kale may now be sown, but in the warmer districts a month later will be early enough.

The young Celery seedlings sown in October and November should now be ready to prick out into beds a few inches apart previous to finally planting out into trenches. Great care will be necessary in selecting suitable weather for this operation, and the position of the bed, which should be in the most sheltered spot in the garden.

Continue sowing for succession Dwarf Beans, Lettuce, Radish, Carrot, Cabbage, Mustard and Cress. In localities free from frost in winter Vegetable Marrow and Tomato may still be sown,

Tomato plants coming into bearing should be supported by stakes. If allowed to trail on the ground most of the fruit will be spoiled by sun blistering in hot weather, or rot ing by coming in contact with the damp soil in wet wea her. Liquid manure may be given occasionally after the fruit has set. Mulch each plant with manure and keep well watered in dry weather. Pinch back all laterals to the second joint until the plants have reached the top of the stakes or trellis. Then top the main stem and continue to pinch back the laterals, and so remove all useless growth until the plants are covered with fruit from top to bottom.

Flower Garden. — Any flower seeds sown this month and next will require very careful attention in the matter of shading and watering, and when sown in the open ground the soil must be specially prepared.

When beds are used the surface should be covered with a layer of decayed vegetable mould, with a little rotted manure, which should be raked in so as to form a surface which will not bake and crack in hot weather when watering has to be resorted to. Where seeds are sown in clumps on a flower border, remove a spadeful of the common soil and replace by a spadeful of the same compost as recommended for the beds. After levelling sow the seeds on the surface and cover lightly with the same stuff passed through a garden sieve and only just sufficient to cover the seed, then shade with a layer of cut grass, hay or straw. This will require to be partially removed as soon as the seedlings begin to show through, and in a few days, choose the first dull or wet day, to remove it altogether. Watering should be done very early in the morning or in the evening.

The following seeds may be sown now for autumn flowering : — Aster, Balsam, Calandrinia, Candytuft, Centaurea Americana, Marguerite Chrysanthemum, Coreopsis, Cosmos, Dianthus, Gaillardia, Sunflower, Marigold, Nasturtium, Petunia, Phlox Drummondi and Zinnia. Sow Carnations for flowering next spring and summer. This is a good time for planting all kinds of Evergreen Shrubs, Ornamental Trees and breakwinds. Where ornamental evergreen breakwinds are required the following will be a good selection : — Eugenia eucalyptoides, Eugenia Braziliensis, Benthamia-fragifera, Grevil'ea, Laurus Camphora, Duranta, Holmskoldia, Lagunaria Patersoni, Schinus Molle (Peppertree), Persea Caroliniensis, Abelia, Ligustrum Japonicum, Thuja, Oleanders, Photinia, and, where frost is not severe, Tecoma Stans, Eugenia Jambos or Rose Apple, and Jacarand Mimosafolia. Where evergreen fences are required these should be planted without delay, also Citrus and other evergreen fruit trees.

Holcus Lanatus Grass.

Mr. T. W. Woodhouse, Normandy, Dargle, on the 4th inst., wrote as follows to the Minister of Agriculture :—

"I enclose samples of a Grass which has survived and thrives on land where cocksfoot, after growing for 5 or 6 years, has died off. The seed of the samples must have been mixed with the cocksfoot. I consider this grass as very valuable for the Colony. I shall be glad if you can give me its name, and inform me where the seed can be procured."

Mr. J. Medley Wood, A.L.S., Botanic Gardens, Durban, has been good enough to supply the following information :—

"The grass of which you send a specimen is Holcus lanatus Linn), a native of Europe, North Africa, and Asia, and has also been collected in the Cape Colony. I do not think that it will be found to be of much value in Natal, since we have others which are much superior to it. Baron F. v. Mueller says of it : 'For rich soil better grasses can be chosen, but for moist, moory or sandy lands, and also for forests, it is one of the most eligible pasture grasses, yielding an abundant and early crop. It is, however, rather disliked by cattle as well as by horses. One of the best rural grasses in recently cleared forest land, not like Cocksfoot, and particularly Rye grass, apt to be attacked by caterpillars; also suited for suppressing bracken ferns after they have been burnt down. Recommendable also for newly drained land. Bears continued grazing off extremely well. Thrives in the hotest and driest regions of Central Australia.' I do not think the seed is procurable in Natal, but may, no doubt, be obtained from seedsmen in England."

Veterinary Departmental Report for December, 1901.

ABSTRACTS FROM REPORTS.

P. V. Surgeon's Office,
December 13, 1901.

MINISTER OF AGRICULTURE—

I BEG to forward you my monthly report for December :—

Sheep Scab.—In Natal, south of the Tugela, there are 16 flocks of sheep under license.

In Klip River County there are 36 flocks under license. As there are now no loot scabby sheep moving about this county, it is hoped that the number of cases will soon be reduced.

Lungsickness.—This disease is still prevalent in Klip River County (particularly among native stock) and in Zululand.

In Natal, south of the Tugela, 12 herds are under license, seven of which are in the city of Pietermaritzburg. No cattle were under license for this disease in the City for some seven months before the Corporation Sanitary oxen were affected.

Rinderpest.—This disease existed during the month at fifteen different centres in Klip River County; at two in Zululand (Nkandhla District); and on farm Jammerdaal, in the Krantzkop Division, as shown in the separate weekly reports sent in. The disease is slowly spreading in the Klip River County, and will, I think, in course of time, extend all over the county. The farmers in this county are in favour of the bile method of treatment, and are mostly using glycerinated bile. Excellent results have been obtained with bile in several of the outbreaks, the disease being at once checked. Some 7,000 doses of bile have been issued from the Bile Station at Bester's during the month, and cattle are being purchased to maintain the supply. The demand for serum up to the present has been very small, only some 200 doses having been applied for and issued. I would strongly advise all farmers in the districts where the use of bile is authorised to at once make provisions for obtaining bile by sending in their 5 per cent. of cattle to the bile stations; they will then be certain of sufficient bile for a double inoculation. The second inoculation is to be strongly recommended. The mortality so far has only been heavy among young stock where there has been neglect in resorting to prompt inoculation. We shall be able to furnish more information regarding the antitoxic properties of the serum from cattle which salted during the last epidemic of Rinderpest at a later date, as will be seen by D.V.S. Power's report.

Glanders.—A well-marked clinical case of this disease existed in a mule arriving from Harrismith. The animal was promptly isolated at the P.W.D. yard on arrival and destroyed. Two other mules which accompanied this animal from Harrismith developed clinical symptoms and were destroyed. Mr. Verney's remarks concerning dunsickness call for attention, and the matter should be taken up at once if any research work is to done during this season.

I have the honour to be,
Sir,
Your obedient Servant,
S. B. WOOLLATT,
P.V. Surgeon.

NEWCASTLE—D.V.S. HUTCHINSON.

Lungsickness. — Twenty-eight fresh outbreaks have occurred in the Newcastle Division, and the quarantine has been raised in 17 cases

Dundee.—Nine fresh outbreaks and two quarantines raised.

Scab.—Newcastle : One outbreak reported and 11 quarantines raised.

Dundee.—Two outbreaks and eight quarantines raised.

Umsinga Division is reported by the Stock Inspector to be free from any infectious disease.

Rinderpest.—This has been the subject of several special reports during the month. The disease exists upon several farms within the Normandien area; but only in one instance has the mortality been heavy, viz., amongst ten head of

cattle belonging to Messrs Dicks, Bierbourn & Rodgers, the cause being due to the fact that the disease existed amongst their cattle some considerable time before they were inoculated. The disease also exists amongst native cattle near Ingogo and on the Charlestown Town Lands. The majority of the farmers about Charlestown and Ingogo have inoculated their cattle with glycerinated bile, so far with very satisfactory results. Two outbreaks have occurred near Dundee, viz., upon the farms Goedgeloof and Babesay. Both herds have been inoculated.

LADYSMITH.—D.V.S. POWER.

My time during the month has been chiefly occupied at the Bile Station, and I have been very busy, as the demand for bile has been increasing daily.

The young cattle have given very poor biles: seven two-year-olds gave an average of only nineteen doses each.

Most of the cattle over four years old sent to the station have not taken the disease even with repeated inoculations of virulent blood, but the old cattle, in poor condition, that take the disease give by far the best biles.

I have been asked a good many times during the month if the serum from old cattle that suffered from the disease during the last outbreak was reliable now. Well, Mr. J. W. McKenzie sent two old oxen here, which I fortified heavily with virulent blood, then after inoculating ten two-year-olds belonging to the same owner with virulent blood, I treated them with the serum from these two oxen. Eight recovered after having the disease in a very bad form, and I feel pretty sure that had the serum not been effective the majority of them would have died. At present I am testing the serum from ten old cattle fortified here, on 40 two or three-year-olds just inoculated with virulent blood, and hope to let you know the result shortly. With the steady progress of the disease, both in this District and in Newcastle, the applicants for bile have greatly increased, and I think most of the people who were at first sceptic as to the existence of Rinderpest in the Colony are now convinced that the disease is amongst us.

There have been fresh outbreaks amongst Mrs. Schoeman's cattle on Brinley, about six miles from here; at Mr. MacPherson's, near Ladysmith; and amongst native cattle at Brakwal, Kleinfontein, and Hill Crest, all of which I have visited.

On the 23rd instant, I went to Acton Homes to ascertain the cause of death of a cow, which Stock-Inspector Freer reported as showing suspicious symptoms, and found, on *post-mortem* examination, that the cause of death was "lead poisoning."

Lungsickness is still prevalent in the District.

No cases of horsesickness have been reported yet in the district, nor any contagious disease amongst horses.

MOOI RIVER.—D.V.S. VERNEY.

Glanders.—A very bad case of this disease occurred at Mooi River in a horse the property of Mr. Levy. This was one of the worst cases of glanders I have ever seen. According to Mr. Levy's statement, this horse originally came from the Remount Depôt. I examined the horse and found both farcy and glanders acutely indicated, and so had the horse destroyed and suitably buried. This horse, according to Mr. Levy's statement, had been running on the Town Lands, Weston.

There has been a large number of cattle suffering from poisoning this month. In one outbreak of disease nine head of valuable cattle died. I had an opportunity of examining these cattle, and I found that paint was the cause of death. Painting had been going on at the Railway Station, and all the refuse of the pots had been thrown outside the fence.

The symptoms shown by the affected animals were very characteristic of lead poisoning, the lead symptoms being very well marked.

I think stock-owners near the line would be wise if they had all refuse, etc., picked up whenever any work has been going on with the railway, and also if any regiments encamp on the farm it would be a wise precaution to bury all the refuse left behind, as nearly all the cases of poisoning have taken place on farms traversed by the line, or where regiments of soldiers have been encamped.

Dunsickness.—There has been a large amount of this disease this month. All

the animals I have seen affected have been mares. This disease appears to be peculiar to the vicinity, and I think it is safe to say that more animals die of this disease in this District than from the dreaded so-called horsesickness. The disease is almost invariably fatal, though animals sometimes rally, and appear much better, but only at a later date to develop the disease in a fatal form. The disease nearly always occurs in the months of December and January. Liver, stomach, and brain show the greatest *post mortem* changes. Liver, in every case I have examined, has shown the most marked cirrhosis. The pathology of the disease is wrapped in obscurity, and the Government Bacteriologist would be conferring a great boon to the horse-breeders of this District if he could throw further light on the etiology of the disease.

The best advice I can give horse-owners is to give their troop of horses a change of veld during the year.

I met Mr. Byrne in consultation over an imported Cleveland Bay stallion. This horse had enteritis. Temp. 107·4 and certainly looked almost like a hopeless case. I am pleased to say this horse recovered.

An imported bull (recently landed) died very suddenly. *Post-mortem* examination showed a cauliflower growth on the left auriculo-ventricular valve of the heart. The cause of this lesion I do not know, and it was most unfortunate for the owner, as imported bulls develop quite enough ailments in this country without developing valvular trouble of the heart.

I have had a number of cases this month to treat, in fact far more than it was possible to properly handle, consequently many have not received the attention I should have liked to have given them. There were also several *post-mortem* examinations I missed, having too many live patients to see. I always regret missing *post-mortem* examinations, as they invariably teach one some lesson or other.

GREYTOWN.—D.V.S. CORDY.

Scab.—One fresh outbreak among a native's flock in Swaimana's Location, in the New Hanover Division.

Lungsickness.—An outbreak occurred among a span of oxen of Mr. C. Niebuhr's on the farm Borrelfontein, in the Noodsberg District.

Glanders.—None.

Rinderpest.—An outbreak occurred on the farm Jammerdaal, in the Krantzkop Division, among a troop of about 340 head. As you visited this outbreak personally, you are in possession of facts relating to same. The troop was biled twice, and at the end of the month 32 animals had died, including 19 calves.

I was performing the duties of D.V.S. at Ladysmith until the 17th of the month, when I returned to Greytown, and proceeded to the outbreak of Rinderpest at Jammerdaal, in the Krantzkop Division. Superintending this outbreak practically took up my time until the end of the month.

RICHMOND.—D.V.S. BYRNE.

Before leaving Howick, I attended a serious case of bilious fever in an imported horse, which recovered.

I took up my new quarters at Richmond on December 10th.

Since I came here nearly all my work has been with calves scouring and dysentery, and I have had success with salts and soda bicarb, followed by an astringent and powders.

My district was, at the end of the year, free from contagious disease, with the exception of Umgeni Division, in which there were only two cases.

I have not seen or heard of any horses which have died from horsesickness in my district this season as yet.

There is no rinderpest.

All stock are doing and looking well except calves.

DURBAN.—D.V.S. AMOS.

The total importations for the month are :—Horses, 6,896 ; mules, 1,435 ; oxen, 1,156 ; cows, 634 ; sheep, 59 ; dogs, 45 ; bulls, 23 ; rabbits, 15 ; calves, 1 ; goats, 3 ; pigs, 2.

During December 104 head were tested with tuberculin, and 103 head were inoculated with quarter-evil vaccine, by order of the Director of the Veterinary Department.

Horsesickness.—Three cases occurred during the month, all of which were horses that were feeding on Town Lands,

and never were placed in a stable at night. I have heard of no stabled horse dying from this disease up to the present.

Glanders.—No clinical case came to my notice. The stable in which the last case was detected is now under complete renovation, and will shortly be finished. One suspicious case was tested, but did not react.

Lungsickness exists in two centres, at the Illovo Estates and Umzimbasi, and the cattle quarantined therein are progressing favourably. My time is now fully occupied at the Point.

Grass Seed Propagation.

MR. WM. ADAMS gives the following information respecting his experience in grass seed propagation.

PASPALUM DILATATUM.

Plot No. 1, 6 x 3 yards.—Ordinary soil, no manure, was forked over and made fine. The seed was broadcasted (October, 1901) and raked in; much of it remained exposed, but it came up freely, and is now 6 to 8 inches high, but it is so mixed up with a grass, which comes up on all cultivated soil, very similar to it in appearance, that it is impossible to tell which is which until it seeds.

Plot No. 2, 4 x 8 yards.—Finding the method of broadcasting on plot No. 1 unsatisfactory, I determined to sow in drills about nine inches apart. I formed these drills with the back of the rake, giving it a backward and forward as well as a dragging sideway movement in the direction of the lines at the same time; this made the drills about ½ inch deep; the seed was then sown and covered carefully over with the teeth of the rake and patted down along the drill with the back. These seeds came up well. I enclose specimen of plant taken up this morning. The plot was sown in November, 1901.

Plots Nos. 3 and 4, 4 x 3 and 6 x 4 yards.—These were sown in the same way as plot No. 2 with the addition of fine bone-dust in the drills, below the seed; the seeds in both these plots came up as thick as possible, touching each other, and are growing as much as the small wingless grasshopper will allow it to do. These plots were sown latter end of November, 1901. Anyone who has yet to sow this seed will perceive the advantage of doing so in drills, as the other grasses and weeds can be pulled out and you can see how it is progressing.

DANTHONIA SEMIANNULARIS.

Plots Nos. 1 and 2, each 8 x 4 yards.—The land for this was prepared in the same manner as for *Paspalum Dilatatum*. Sown in October, 1901, broadcast, and raked in; hardly any came up except where it had partial shade for the latter half of the day. On the two plots I daresay there are from 150 to 200 plants. I enclose specimen. It will be seen that it is quite different to any native grass, and there is no difficulty in distinguishing it from them when you have once seen it.

Plot No. 3.—The ground was treated with fine bone-dust; seed broadcasted, and then soil was broadcasted over it, so that the seed was first covered and patted down with the back of the spade; not one seed came up. This plot was exposed to the sun the whole day.

Locust Notice.

OWING to the extensive hatchings of locusts in portions of the Lion's River and Umgeni Divisions, the Department of Agriculture desires to draw the attention of farmers and other landowners to the necessity for united effort on their part, with a view to controlling and coping with the pest whilst it is in the hopping stage. It is suggested that the sugar or treacle and arsenic solution should be used for the purpose, and in order to encourage and assist in combined action, the Department invites communications from farmers and others desirious of taking action, and will make a contribution in each case where such combined action is taken.

H. D. WINTER,
Minister of Agriculture.

Agricultural Department,
10th January, 1902.

Queensland Cattle.

AN INTERVIEW WITH MR. BOOKER.

By Ergates.

IN the recent shipment of cattle for Mr. J. Baynes, M.L.A., and for the Government, were some fifty head of stock, the property of Mr. C. J. Booker. Mr. Booker, whose address is Wollongbar, Queensland, at the suggestion of Mr. Philp, the Prime Minister of Queensland, who, as it will be remembered, had been visiting South Africa, accompanied the shipment for the purpose of practically studying the whole of the conditions involved in shipping cattle from his country and disposing of them in this. A very short interview with Mr. Booker is sufficient to convince anyone that he is exceptionally qualified for the object he has in view. He is both a "squatter" and a "grazier"; the first signifies a breeder on a vast leasehold, and the second indicates one who fattens off on rich grass, freehold land, steers for the butcher which he has obtained from the "squatter." Every year Mr. Booker "turns off" three or four thousand head of cattle. "Farmer," in Queensland, means a grower of crops only. Queensland, as regards bovine sickness, seems to be as unfortunate as the worst parts of South Africa. Lungsickness, which Queenslanders shortly call "pleuro," they have had since 1863, and redwater, which appeared 30 years ago, is now endemic in practically the whole of the north west half of the colony. Redwater, which is called "tick fever" by the Australians was never associated by them with ticks until eight years ago. Readers of the *Journal* will remember that the disease conveying faculties of ticks were discovered by American investigators. The news reached Queensland, and the Agricultural Department of the colony despatched their pathologist, the late Dr. Hunt, and their bacteriologist, Mr. C. J. Pound, to America, to study the discoveries on the spot. Since that investigation, according to Mr. Booker, redwater in Queensland has been under perfect control. In reply to my questions about dipping, Mr. Booker said :—"About four years ago the advantages of dipping became generally recognised, and I may now say the practice is universal. Of course I am referring to only the redwater division of the colony. Apart from the infection, the ticks, by their numbers, are a curse to the cattle-owner. The beasts are so bled as to suffer from anæmia, and in cases they eventually die of what we call 'tick worry.' So far as I have seen in Natal you do not seem to be so plagued with the pest as we are. The cattle just arrived were all badly covered with ticks when they were taken on board at Bowen. One of the stipulations of Mr. Baynes was that the cattle for him should be tick infested—that they were purchased in redwater country would not be enough. Before we bring cattle from South Queensland, or other clean parts of Australia, into our redwater country, we inoculate them with recovered blood, and in many cases re-inoculate them with virulent blood. After a second inoculation with virulent blood they can be safely said to be thoroughly immune. Cattle-owners, who systematically inoculate as I have described, and dip every six weeks afterwards, experience no losses from redwater."

"What do the 'dips' cost ?"

"They vary greatly ; all depends on the local circumstances. We very commonly use wood. Stone and cement would probably be the best and cheapest here. I expect the cost with dripping yards would work out at about £40."

"At what rate do you put them through ?"

"About 300 an hour."

"And the formula ?"

"Practically we all use what is called Christian's dip. The price, of course, varies, according to the distance and facilities of communication with the nearest shipping port. It works out, however, at from ¼d. to ½d. per head. Here is the formula :—

Water	... ...	400 galls.
Arsenic	... ...	24 lbs.
Common soap	...	24 „
Stockholm tar	...	5 galls.

The Business Aspect.

"The question of future importation will largely hinge upon how the immune cattle imported by the Government, Mr. Baynes, and myself succeed. If, as I have every confidence, they will prove themselves to be immune from redwater, and they can stand the change of conditions, a very considerable trade in breeding stock should for some time, at any rate, be the result. Cattle are bound to be scarce in South Africa for some years, and then, so far as my observation has gone, our cattle are generally of a superior stamp to yours."

"And what about the price?"

"At present I cannot speak definitely on that point. Owing to heavy losses from continued drought, cattle have gone up 50 per cent. in price above what they were a couple of years ago. The freight at present is also very high—the recent shipment was only an experiment—but when the war ends freights will doubtless become much easier."

Mr. Rhodes' Shipment.

"How was it that the cattle purchase of Mr. Rhodes for Rhodesia a couple of years ago was so disastrous?"

"That is easily explained. His lot were purchased in the Hunter District, N.S.W., hundreds of miles from redwater country. If those cattle had been sent to the redwater country of Queensland, they would have died just as freely as they did after being landed at Beira.

Paspalum Dilatatum.

"Paspalum dilatatum is being somewhat boomed," I said, "in our departmental journal. Do you, as an Australian, know anything about the grass?"

"I do. It cannot be boomed too much. In our dairy districts it is being largely sown, and is recognised as the best of fodders for dairying. Large areas are being put under this grass in the districts of the Clarence, Richmond, and Tweed rivers—the great dairy districts of New South Wales. There is nothing like it in Australia. The seed is difficult to get. Mr. Jackson, Wollongbar, via Lismore, New South Wales, is a large grower of the seed, and I believe the quality of what he sells can be relied on."

Mr. Booker will visit Rhodesia, and the Transvaal, Orange River and Cape Colonies, before returning to Queensland.

The One-Price Heifer.

Yew wanter buy that heifer, Zeb? I don't believe yew can;
I wouldn't sell that heifer, sir, to any liv'n' man.
No, sir, if yew should come an' lay a fifty in my hand
I'd go an' shet the stable door an' let that heifer stand.
I'd let her stand right where is till she is old an' grey
Afore I'd sell one side of her, thet's all I've got to say.
Yew heerd I wanted to dispose? Yew must hev heerd it wrong;
I'd buy a dozen like her, Zeb, if yew'd bring them along.

Of course I've got a lot of stock, more stock 'en what I need,
An' I'm short of stable room, an' somewhat short of feed;
But ez fer sellin' thet there beast, I wouldn't, no, siree!
Let forty dollars come between thet heifer, Zeb, an' me.
I am a one-price critter, Zeb, no man kin beat me down;
She's wuth a heap more 'n forty, Zeb; ask any man in town.
Hi Hunker wants her purty bad, an' so does Deekin Hale:
But, ez I said before, of course, the heifer ain't for sale.

She's gentle, an' she's good an' kind, an' slicker then an eel;
A child could milk her any time, she'd never raise a heel;
She never hooks nor jumps the fence, she never runs away,
An' comes around at milkin' time ez regular ez the day.
Yew'd orter see the milk she gives, it's yaller, thick, an' sweet,
An' es fer quantity, by gum, thet heifer can't be beat!
They's junks of butter fl atin' round inside the milkin' pail;
An' speakin' of her butter Zeb—but then, she ain't fer sale.

Yew say yew're bound to hev her, Zeb Yew? want her purty bad?
The slickest piece of cow flesh, sir, a farmer ever had!
Wuth thirty dollars ez she stands, an' not a dollar less;
For I'm a one-price critter, Zeb, yew'll find thet out, I guess.
Wuth thirty dollars as she stands, I'll tell yew what I'll dew:
I'll swap her now for twenty-five—'twixt me an' her, an' yew.
Jest twenty-five, no more or less, for I'm a one-price man;
An' if yew'd want to swap her back, why, durn it, Zeb, yew can.

—American paper.

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of December, 1901.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1901.	Total for same period from July 1st, 1900.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	84·2	66 6	94·1	59 6	3·89	22	1·34	20th	25·52	15·65
Stanger	84·6	64·4	109	53	7·99	19	3·87	19th	23 86	18·36
Verulam	87·7	67·3	99	59	5·78	17	1 91	19th	21·48	16·45
Greytown	83·6	61·2	94	53	4·10	15	1·25	17th	21·34	13·04
Newcastle	96·9	64·8	102	57	3·62	17	1·13	1st	17.73	14 48
Estcourt	85·6	58·6	100	52	3·90	15	1 35	20th	13·95	14·66
Port Shepstone ...	81 9	63·4	91	58	4 62	19	·88	8th	30 95	15·69
Umzinto	85·4	57·0	93	51·5	3 94	13	1 36	20th	20·16	15·02
Richmond	77·5	58·3	94	51	4 93	20	·81	19th	20·23	15·91
Maritzburg	84·4	60·3	98	52	4 57	22	88	20th	15 95	11·78
Howick	81·6	58·5	95	50	4·04	23	·61	22nd	16 24	8·46
Dundee	88·7	57·1	95	53	3 83	11	1·02	1st	19·01	...
Weenen	93 5	61 0	105	56	2·74	14	93	19th	12·35	10·92
New Hanover	85·6	59·0	104	52	4·05	19	1·73	18th	18·64	11·47
Hillcrest	75 9	60·5	99	53	6·58	20	2 85	21st	22·60	...
Mapumulo	87·2	61·1	102	41	4·28	12	·72	8th	22 65	16·28
Nongoma	79·4	61·1	94	54	3·56	6	1·25	1 t	16·18	18·20
N'Kandhla	76·5	58·4	93	43	6 21	13	3·03	2nd	...	...
Qudeni	74 2	52·5	87	40	8 23	24	1·68	31st	29·82	...
Hlabisa	84·1	63·1	105	55	4 15	9	1·30	21 t	20·10	...
Melmoth	82·5	61·4	99	54	4·35	16	1·80	2nd	17 02	...
Eshowe	80·9	62·9	99	56	8·88	18	2·60	20th	29·48	25 87
Nqutu	77.9	59 6	98	49	5·68	10	1 88	2nd	...	...
Lower Tugela... ...	86·4	66·0	103	60	5 27	15	2·35	20th	...	...
Point	...	...	...	...	1 95	9	·65	19th	16·10	12·77
South Coast Junction	...	...	..	...	3·10	18	1·10	20th	24 94	...

OTHER STATIONS.

Estcourt	...	...	98	52	4·08	18	1·23	19th	15·13	15·73
Nottingham Road ..	...	...	.	...	5·45	16	·69	18th	21 68	17·69
Adamshurst	...	...	95	55	4·63	15	97	13th	15·95	...
Hilton	...	...	93	52	3·91	22	·65	18th	18·71	12·69
Ixopo (Gorton) ...	...	...	84	58	3·50	21	·90	20th	11·79	7·03
Mid Illovo (Ismont)...	...	...	94	53	7·60	15	2 81	20th	27·33	15.25
Ottawa	...	...	...	...	6·42	15	2·07	20th	22·01	16·02
Mount Edgecombe ...	...	...	91	63	7·74	15	1·81	19th	26 12	17 66
Cornubia	...	...	...	...	7 03	...	...	...	27 03	20·68
Milkwood Kraal ...	...	...	...	...	6 72	...	..	...	20 99	11·42
Blackburn	...	...	...	...	5 25	...	...	...	22·96	16·33
Saccharine	...	...	...	...	7·74	...	...	...	25·14	17·73
Prospect Hall... ...	...	...	...	...	4·01	...	...	...	17·70	16 59
Clairmont	...	...	...	...	3·11	10	65	19th	25·71	14 99
Equeefa	...	...	95	58	5·67	21	2·52	20th	25·33	16·84
Umzinto (Beneva) ...	...	...	...	...	6·40	19	·98	7th	27·11	16·30

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	A. Harding ...	Driefontein
		,,	F. R. Moor ...	Greystone.
		,,	J. Oates ...	Oatsvale.
		,,	R. C. O'Neil ...	Hillgrove.
		,,	C. J. Labuscagne...	Haatsfontein.
		,,	B. J. Wilkes ...	Portington.
		,,	A. G. Harding ...	Marshlands.
		,,	Du Plessis & Cloete	Compensation.
		,,	J. Van der Merwe	Welgekoose.
		,,	C. W. Dennill. ...	Guadaloupe.
J. Button ..	Estcourt, South of Bushman's River	,,	S. Nel ...	Wagon Drift.
		,,	C. B. Lloyd ...	Hidcote.
		,,	L. Berthon ...	Littlecote.
		,,	J. Chadwick ...	Howard.
		,,	C. J. Smythe ...	Stratherne.
A. H. Ball ..	Weenen ...	,,	W. Lotter ...	Doornkloof.
		,,	P Van Rooyen ...	Middleburg.
		,,	C. P. F. Van Rooyen	Mona.
		,,	A. Hair	Oribee Vlakte
		Lungsickness	Maboko	Bushman's River Poort.
E. J. B. Hosking ...	Upper Umkomanzi	,,	J. Baynes ...	Meyer's Hoek and Onrust.
R. J. Raw ..	Impendhle ...	Scab	C. P. Speirs ...	Mount Park.
		,,	F. Knapp ...	Furth.
		,,	S. M. Shaw ...	Umgeni Poort.
W. Wilson	Polela	,,	A. W. Leggatt ...	Selbourne.
		,,	J. Hayes ...	Glengariffe.
		,,	H. Pennefather ...	Home Rule.
		,,	R. C. Gold ...	Woodend.
		,,	R. M. Arbuckle ...	Costmore.
		,,	J. J. Van Dyke ...	Riverport.
		,,	J. Van der Merwe	Nooitgedacht.
		,,	S. Maritz ...	Maritzdale.
		,,	F. E. Peto ...	Clovelly.
		,,	H. Nicholson ...	Fondling.
		,,	H. C. Gold ...	Dartford & Greenend.
		,,	C. A. Phipson ...	Macedonia.
W. Wilson	Polela	,,	J. Van Wykes ...	Epsom.
		,,	Caleni	Location.
		,,	J. Willson... ...	Stony Glen.
		,,	G. Houston ...	New Bigging.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	T. Owen ...	9, Pietermaritz St.
			P. H. McCrystal...	11, ,,
		,,	F. Knapp	,,
		,,	Kamana	Sand Pits, Town Hill
		,,	H. H. Boden ...	The Knoll, Hilton Rd
		,,	Mrs. Rea ...	90, Pietermaritz St. Pietermaritzburg.
J. A. Morrison ...	Durban & Umlazi	,,	P. Saville ...	Umzimbazi.
		,,	W. Pearce ...	Lower Illovo.
W. A. Hutchinson	Alfred ...	Scab	J. Wessels ...	Sheepwalk.
		,,	Geletu Flentyi ...	Location
		,,	Inkubi and Duli ...	Location
		,,	C. J. Triegaart ...	The May.
		,,	Umhlenga	Mount Nebo.
		Lungsickness	T. Groom	Ingeli Poort.

Stock Inspector.	District.	Disease.	Owner.	Farm.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungs'ckness	F. E. Zunckel ...	Rivulet.
		,,	Natives	Hongerspoort.
		,,	Wm. Zunckel and Umliezana	Wilhelmus Hohé
E. Varty ...	Umvoti, Western Portion	Scab	J. M Van Rooyen	Pompoennek.
B. Klüsener ...	Lower Umzimkulu	Lungsickness	— Thompson ...	Marburg.
		,,	W. Clothier ...	Ultima Thule.
		,,	C. Mahai	Marburg.
		,,	C. Kaupar ...	,,
		,,	J. Malichi	,,
		,,	H. Mason	Oakhurst.
A. S. Parkinson ...	New Hanover ...	Scab	Umshola & Makenke	Swaimana's Location
		,,	R. Smith	Effingham.
		Lungsickness	C. Niebuhr ...	Borrelfontein.

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

Rinderpest exists on farms Kirkintulloch, Hill Crest, Riet Kuil, Zwaartkloof, Doornkraal, and Reproach in Ladysmith Division; in the Normandien District and Ingogo and Charlestown Town Lands; in the Newcastle Division; on the farm Jammerdaal in the Kranskop Division; and at native kraals in the Nkandhla District, Zululand; also on farms Goedekloof and Babesay, in the Dundee Division.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 15th January, 1902.

How to Pack Flowers for Post.

SO many of our friends on the Downs, says the "N.S.W. Agricultural Gazette," send boxes of beautiful flowers to Brisbane during the season when the most beautiful and exquisitely scented European flowers are in bloom, that we should wish them to study the art of packing them for the journey so that they may arrive in good condition. Many a box have we seen full of violets crushed and partly destroyed by the final watering considered essential before closing the parcel. If blooms are packed into a box carelessly, with a cabbage leaf beneath and above them, and then doused with water with the idea of keeping them fresh, by the time they arrive at their destination, after the rough handling they usually receive in the guard's van, the greater part are destroyed, and the remainder look like the Last Rose of Summer—faded and gone. Flower-packing is an art well understood by florists. Look at the exquisite blooms in some of the Brisbane florists' windows. Many of them have stood a journey from Sydney and even from Melbourne, yet they look as fresh and delicate as if still growing on the plant.

The best travelling box is one made of tin, but strong cardboard boxes will do on emergency. Line the box with white paper. Cut the flowers early in the morning—never in the afternoon. Lay them in the box one by one, filling up the whole space; if they do not fit into the corners, stuff the latter with soft tissue paper. Do not sprinkle any water on them, but cover with a few fern leaves, and over these place a sheet of damp cotton wool. The flowers will travel safely, provided the train and postal officials are careful. If they are not so, it will probably be your own fault. To avoid accidents, label the box in clear, large letters, "Cut Flowers." The recipient of flowers thus packed will find no damaged ones in the parcel.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of December, 1901 :—

Name of Colliery.	Labour Employed. Above Ground. E.	N.	I.	Below Ground E.	N.	I.	Coal raised. tons.	cwt.
Natal Navigation	15	25	181	14	165	199	11,026	10
Elands Laagte	11	20	165	10	125	286	9,201	0
Dundee Coal Coy.	14	22	122	13	84	290	9,144	11
Natal Marine	15	73	22	7	275	6	7,517	2
St. George's	13	140	50	7	153	25	4,909	0
Crown	6	52	3	5	115	1	2,105	0
Newcastle	4	15	11	4	142	0	1,649	15
Dudley	5	18	6	2	42	0	849	2
Natal Steam Coal	4	28	8	2	37	0	783	14
Central	9	27	1	2	51	3	660	17
Ramsay	2	12	0	1	40	0	597	11
West Lennoxton	1	3	4	1	8	16	404	19
Natal Coal Estate Syndicate ...	6	15	6	1	45	3	283	0
Fast Lennoxton	1	0	4	1	3	7	223	0
Hillside Colliery	0	0	1	1	0	4	65	11
No. 42			No return.					
Total	106	450	584	71	1,285	840	49,411	12
Corresponding month, 1900 ...	93	470	356	59	1,495	613	42,933	2

Mines Office,
Jauuary 13th, 1902.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of December, 1901 :—

	tons.	cwt.
*Coal Bunkered	22,188	4
Coal exported to Cape Colony	5,401	9
„ Ceylon	126	0
Total	27,715	13

*Included in this is Imported Coal, viz., 307 tons 3 cwt.

GEO. MAYSTON,
Collector of Customs.

Custom House, Port Natal.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc : 37, 1900. For the month of December, 1901.

Date.	Description.	Quantity.	Imported from.	Ship.	Remarks.
1901.					
Dec. 6	Ornamental Plants for Durban Botanical Gardens	1 case	St. Alban's England	PembrokeCastle	Free of Pest
„	Potatoes, table	1103 cases	Sydney	Salamis	„ „
„	Carnations (baggage) ...	1 „	London	PembrokeCastle	„ „
„ 9	Ferns and Crotons, do. ...	2 „	„	Umtali	„ „
„ 16	Potatoes (seed)	135 „	„	Bulawayo	„ „
„ „	Potatoes (table)	902 „	„	„	„ „
„ „	Myrtle and cactus (baggage)	2 Plants	Cape Town	PembrokeCastle	„ „
„ „	Potatoes	1,000 cases	London	Aros Castle	„ „
„ 23	Grapes...	75 barrels	„	Inanda	„ „
„ „	Potatoes (table)	4,571 cases	Hamburg	Herzog	„ „
„ „	Potatoes (table)	182 „	Egypt	Kanzler	„ „

C. B. JONES, Examining Officer, Agricultural Department.

Custom House, Durban, 4th January, 1902.

Paspalum Dilatatum.

"FOUR years ago," writes "J.K.Z." in the "Queensland Country Life," "I sowed my first seed and also planted a few thousand roots to form a seed bed. My farm is now practically sowed with paspalum, and the more I see of it the better I like it. Of course I mix other grasses and clovers as a change for the stock, but paspalum is the basis of the pasture; it has proved itself a mainstay for the stock, growing vigorously when the fierce heat had withered up the other grasses. I have carefully observed it in all stages and variations, and I have come to the conclusion that paspalum dilatatum is the very best grass for the farmer to rely upon as a permanent pasture. I say permanent advisedly, for after four years' grazing the paddocks are still improving and giving an increased quantity of feed. It is with us carrying a beast to the acre all the year round, and yet, during this season, I have in rotation been able to shut up every paddock, allowing the grass to grow and shed its seed. By this method a perfect turf can be obtained; it does not spread from the roots and joints like some of the other paspalum grasses, of which there are great variety. It stands any amount of grazing, and the trampling of stock does not injure it. In this district it grows nearly all the year round, but naturally a little slower during July, August, and September. It stands drought well, the frosts do not kill it, and I have cut it down and run a fire over it, and after this severe treatment it grew as vigorously as ever. There is nothing hard or wiry about this grass. It is soft and succulent, and there is no part of it from the crown to the seed-heads that the stock will not eat. My observation of grasses has extended over many countries, as well as over most of the Australian States, but I have never met with any grass that would equal paspalum dilatatum.

'I have no knowledge as to its value for sheep, but all other animals are fond of it, and keep up condition. Its qualities for dairying purposes are undoubted, and every cow is kept in such condition as to enable her to give her standard of quality in the milk produced. My average test at the milk separating station is amongst the very highest, ranging from 3.6 to 4.3 for butter fat. I have found the proper times to sow are—middle of July to middle of October, first week in December to first week in February. In the former it catches the spring rains, and in the latter the summer rains, both accompanied by heat which appears very necessary. The quantity of seed to sow per acre varies with the requirements: 5 lbs. to 8 lbs. per acre on well-prepared ground will soon result in a good paddock. If 1½ lb. to 2 lb. per acre is sown, after grazing it should be held up about October, and allowed to grow and shed all its seed naturally. It will soon spring up, and the young grass, if anything like a favourable season takes place, will be fit to graze in May. I consider that allowing the grass to shed its seed naturally is the very best and surest method of thoroughly establishing the pasture.

As soon as the stalk begins to bend over, and attain a light greenish straw colour is the time to commence picking. Deal very lightly with it or you will lose the best of the seed. The heads should then be taken into a barn and shaken. This shaking may be repeated two or three times next day, by which time all the matured seed will be obtained. In leaving the heads in heaps be very careful not to allow them to heat, or the seam will be spoiled. The heads may now for a day be turned and thrashed, and although the quality of seed obtained by this second manipulation is very inferior, still a percentage of it will germinate. It may be used, therefore, for thickly scattering over rough ground.

"A great feature, too, in its favour is that it is not difficult to eradicate if a paddock should be required for cultivation. Ploughing alone would not do it, but by cultivation and bringing the plants to the surface, rolling and harrowing to free the roots from the soil, it quickly dies by exposure to the sun. It is very tenacious of life if soil should be left on

the roots, especially in wet weather, but it does not grow from pieces of root like couch and some of the peas, but given plenty of cultivation and stirring, and a few fine days, and the trouble is over.

"When the plants are far apart the grass grows into big tussocks, but as soon as the spaces are filled up it forms quite as good a turf as any of the other grasses.

"There can be no question as to its being an invaluable grass, and it is now being eagerly sought for in this district since it has passed the stage of experiment."

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—Trade all round practically remains the same as it did a fortnight back. Notwithstanding the fact that the New Year has commenced, and many predicted that its advent would inaugurate a rush of trade. These predictions, unfortunately, have not been realised, and prices for produce, especially forage, mealies, and potatoes, are the lowest recorded for January for a number of years.

Mealies.—The average price for mealies during the past fortnight has been 5s. 6d. per 100 lbs., or 11s. per muid.

Forage. Inferior has been as low as 3s and 5s. 6d. per 100 lbs, better samples from 6s. to 8s. 6d. per 100 lbs.

Hay.—Some samples have been as low as 2s. 6d. per 100 lbs.; better quality has realised from 4s. 2d to 4s. 5d. per 100 lbs; bedding as high as 33s. per load.

Potatoes.—The market has been abundantly supplied of late, and prices have been as low as 2s. 6d. per 100 lbs., a price which certainly cannot pay the grower; but better samples have realised from 7s 6d. to 9s. 7d. per 100 lbs.

Onions.—From 8s. and 9s. to 12s. per 100lbs.

Lucerne.—About 8s. 6d. per 100 lbs.

Poultry.—Fowls from 2s. 4d. to 3s. 8d. each; ducks from 7s. to 8s. per pair.

Butter.—From 6d. to 1s. 9d. per lb.

Eggs.—From 1s. 4d. to 3s. 2d. per doz.

Sundries.—Beef 2d. to 4½d. per lb; mutton 3d. to 8d. per lb.; pork 6d. to 8d. per lb.; bacon 5d. to 7d. per lb.; rabbits, 2s. 6d. each; pigeons, 2s. per pair.

Mabele. — According to quality: while some samples have been as low as 5s, others have realised 8s. and 9s. per 100 lbs.

Vegetables — Beans, beetroot, cabbages, carrots, cucumbers, lettuce, peas, tomatoes, and turnips, so'd every morning.

Fruit. — Apricots, apples, oranges, lemons, grenadillas, pineapples, and strawberries offered almost daily.

Firewood.—From 7d. to 1s. 2d., per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade is very dull, and there was a pronounced falling off during the last fortnight.

Mealies.—The market remains bad, and the weevil is forcing holders into the market. The surplus crop remaining over from last season is still heavy, and no relief is visible from any quarter. Up-country farmers ask 11s. 6d. per muid at the station, but buyers are chary, and only accept for present requirements.

Potatoes.—The crop is enormous, and nothing like it has ever been seen in the Colony before; the quality, too, is superb. Quotations are unreliable, and range between 10s. and 12s. 6d. per bag for best samples only.

Mabele in small demand, and about 20s. per bag is being paid.

Hay is in request, but the season is not a good one for harvesting up to the present. Immense quantities will probably be reaped later on.

Forage.—A good deal is being offered, but the local enquiry is small.

WOOL AND MOHAIR.

Mr. James Egner writes: — Last Monday when about 800 bales, chiefly from East Griqualand, were offered, prices showed an advance of quite a farthing on previous sales. This was principally due to the reduced freights, owing to the Bucknall line competition. There will probably be one more sale before the close of the season. It is gratifying to learn that the prospects in London are more hopeful notwithstanding the large supplies coming forward from Australia and other countries.

Mohair. This article, which has been practically unsaleable for the last six months, is, I am glad to say, in sympathy with wool, having its turn Owing, however, to heavy accumulations of stocks, the rise will probably not be noticeable until the present stocks are disposed of. In Port Elizabeth there are over 13,000 bales which have been unsaleable at 8d. per lb., but are now moving off at 8½d., and higher.

The lamentable accident at Sandown, which resulted in the death of Daniel Clare, appears to offer a warning against the practice, occasionally seen at steeplechase meetings, of tying the reins together to furnish a stronger and easier hold. Boa, Clare's mount, came down at the water; having dropped his hind legs in he failed to recover, crushing the unfortunate jockey on whom he fell. It was stated in evidence that after the accident the reins were found to be so tightly knotted that it was difficult to undo the knot even with a button-hook; from which it would seem as though the knot had been jerked tight against Boa's withers (which are high) when he threw out his head in the attempt to recover himself.

The Agricultural Journal

AND MINING RECORD.

VOL. IV. FRIDAY, JANUARY 31, 1902. No. 24.

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Reading Cases for holding a year's issues of the "Agricultural Journal," leather back, cloth sides 26 strings, lettered on side, 1s. 6d. each. Binding yearly volumes in cloth, 4s. each.

CONTENTS.

Lead Poisoning.

MR. GEO. R. RICHARDS, M.L.A. recently wrote on behalf of a farmer residing in the Springfield district, respecting the lead-poisoning of cattle which results from the eating of tins and other *debris* left on camping grounds. Accompanying Mr. Richards' letter were half a dozen pieces of lead (solder—about the size of 3d. pieces), which were found in the stomach of one of the dead animals.

The Principal Veterinary Surgeon recommends salt licks be given to cattle to lessen the propensity of picking up such foreign bodies. Owners should endeavour so far as is possible, to collect all tins, etc., in their paddocks. Any animal shewing signs of poisoning by this cause should at once be given a dose of Epsom salts, 2lbs. for an adult (Mag. sulph. being one of the best and cheapest antidotes for lead poisoning), followed by stimulants, such as rum or whisky (three parts of a tumbler in a pint of water or gruel every six hours), or strong coffee, if there is much prostration.

Chewing's Fescue Grass.

THE Minister of Agriculture has obtained a quantity of Chewing's Fescue Grass for which he will be glad to receive applications for small quantities from all who are prepared to make trial experiments with the seed.

This seed has lately attracted a good deal of attention in New Zealand, owing to its suitability for poor lands on which other grasses die out. In sowing, it is desirable to bulk up with rye grass, or some other less permanent grass, and on dry lands a heavy seeding is recommended.

Wheat.

SEVERAL 2 lbs. samples of different varieties of wheat have also been received, and will be distributed to any who wish to experiment in wheat growing.

South African Indigenous Fish.

THE Secretary for Agriculture, Capetown, has forwarded a communication to the Minister of Agriculture, pointing out that very little is known of the native fresh water fishes of South Africa, and asking for the co-operation of this Government in the collection of information on this important subject, which has a very direct bearing on the work of trout acclimatization. Dr. Gilchrist, of the Cape, considers that it would be of great value if arrangements could be made for specimens of indigenous fish to be forwarded to him for examination and report. The Minister will at any time be pleased to receive such specimens, accompanied with particulars as to time and place of capture, and will forward specimens so supplied to him to Dr. Gilchrist at the Cape.

Return of the Dairy Expert.

MR. E. O. CHALLIS, the Government Dairy Expert, has returned to the Colony and resumed his duties. During his absence he visited, with the object of studying the latest methods, some of the leading creameries of the United States, Canada, England, Scotland, and Denmark.

District Reports.

BULWER, January 25th.—Heavy rains have continued to fall regularly up to the present date, and Mother Earth is thoroughly saturated. During the last fortnight we have only had one day in Bulwer without rain. All kinds of trees and shrubs have made considerable growth this season in consequence of the plentiful supply of rain. Even the slow-growing Pinus insignus and firs, which made little or no growth last season, have made considerable growth. The loquat trees in Bulwer, which have made very little growth for years, have now shot up considerably. I am sorry to have to report that the top grub, or caterpillar, in the mealies has been most destructive throughout this Division. This, following the damage done by the underground grub at planting, will affect the annual yield to a serious extent, I fear. Fruit just now is very plentiful, especially plums, in many varieties, and has been the best

fruit season for years. With the exception of a few cases of gallsickness in young animals, all kinds of stock have been free from disease for the last three months, and in the best of condition. The Agricultural Hall buildings have come to a standstill through, I believe, a difficulty in getting bricks for the building. Some of the walls will have to be pulled down and re-built, the heavy rains having damaged them. The additions to the Government Buildings at Bulwer are being pushed on all round as fast as possible. The new school house, I believe, is to started shortly, and when completed the appearance of Bulwer will be more like a real township. The water scheme for the village is still progressing. Mr. Jonathan Hutchinson, the eminent surgeon from London, visited the District on the 18th instant, and examined a number of natives supposed to be suffering from leprosy—most of the cases proved to be the loathsome disease. Some of the victims are unable to say how they contracted the disease; two especially, who are the only lepers in their respective families. The disease had never been known in the families before.

H. W. Boast, Magistrate.

INANDA DIVISION 20th January.—Contrary to my prediction when writing last, copious rains fell a few days after; in fact, before my lines were in print. Altogether, the weather has been most puzzling this season. When the glass has been low, and all the appearances were in favour of rain, none has fallen, while the heaviest rains of the season have been with a very high barometer. On the whole, the rainfall has been below the average, though it has been so well distributed—along the coast at any rate—as never to have allowed a long interval of drought, the consequence being that crops have seldom shown signs of languishing for more than a day or two at a time. Below I give a few particulars of the meteorological observations made here during the month of December, 1901, and for the whole of the past year. December, 1901: Rain, 5·78 inches, which fell on 15 days. Heaviest fall, 1·66 inches, on the 21st. Maximum temperature in the shade, 99 degrees, on the 6th; minimum, 59 degrees, on the 11th; mean temperature for month, 77·5 degrees. Rainfall for the year 1901 :—

January	...	7 38 in.	fell on	15 days.
February	...	2 53	„ „	9 „
March...	...	6 08	„ „	15 „
April ...	...	5·21	„ „	7 „
May ...	...	0·93	„ „	5 „
June ...	...	2·19	„ „	8 „
July ...	...	0·00	„ „	0 „
August	...	2 03	„ „	4 „
September	...	6·00	„ „	10 „
October	...	2·85	„ „	14 „
Novemher	...	4 83	„ „	17 „
Decemher	...	5·78	„ „	15 „
Total	...	45 81	„ „	119 „

The heaviest fall was 4·05 inches, which fell on the 29th January. The total rainfall for 1900 was only 26·79 inches, which fell on 112 days—the fall for 1901 thus showing an increase of 19·02 inches, or nearly 75 per cent., and accounts for the fine mealie and tobacco harvest of last season, and the splendid crop of sugar now being dealt with at the various mills; and present appearances indicate a still better sugar crop for next season, though the standing mealies and tobacco do not look as well as one would expect under the circumstances. The maximum temperature in the shade during 1901 was 110 degrees on the 28th November, and the minimum 43 degrees on the 12th July—the mean temperature for the whole year being 71·8 degrees. I have not the mean for 1900 to enable me to draw a comparison, but the lowest temperature for the latter year was the same, viz., 43 degrees on the 31st May, and the highest in the shade 106 degrees (or 4 degrees less than for 1901) on the 6th November, 1900. It would thus appear that though January and February are the most trying months of the year on the coast, the highest occasional temperatures are reached during November. Stock of all kinds is thriving throughout the division; there are at present no cases of disease of any kind known to me, nor have I heard yet of any cases of horsesickness. It may be of interest to fruit growers to hear that Mr. Robert Morrison, of Stuckridge, Lower Tugela Division, which is portion of Victoria County, has succeeded in raising pineapples from seed. I cannot give particulars yet as to duration of time of growing before fruiting and the like, as I have not had an opportunity of conversation with Mr. Morrison on the subject. One fruit was sent me by a friend for inspection, and it certainly was very fine in appearance. It was considerably larger than the common kind grown in Natal, though not so large as the Queen Pine. The colour of the rind is russet, instead of the usual yellow or golden colour of the common pines. In taste it seemed to me hardly so sweet as the common variety, but of a more delicate texture and flavour. Doubtless Mr. Morrison is propagating it in the usual way from shoots, and it should soon become plentiful. I have no hesitation in saying it will become a great favourite, and command better prices than the common kind, its fine appearance being of great advantage.

John L. Knight, Magistrate.

NEW HANOVER, 10th January.—I wish to bring to the notice of the Veterinary Department a disease of horses, which seems peculiar to the Noodsberg and Noodsberg Road Districts. I never heard of a horse recovering from it. The farmers call it "Jaagsickness"; probably from the symptom, that the flanks of the horse heave like those of a horse which has been raced too much. The horse goes on feeding; there are days on which the owner hopes for a recovery, as there seems to be improvement. But relapses will come; the horse lingers on for more or less time until death. To me it looks very much like what is called "galloping consumption" in mankind. It appears to be an incurable inflammation of the lungs of the horse. Perhaps the thick fogs of the Noodsberg have something to do with this disease.

A. Ritter, Magistrate.

Weekly Rinderpest Report.

28TH JANUARY, 1902.

Ladysmith Division.

KIRKINTULLOCH. — No fresh outbreak amongst old infected troop. Amongst Liana's cattle there have been five deaths and two are sick.

Buy's Farm.—Seven dead ; thirty sick.

Kleinfontein (adjoining Buy's farm .— Natives cattle : fifteen dead out of seventeen. This outbreak was not reported. The native is being prosecuted.

Farms Hillcrest, Kleinfontein, Swaartkloof, Doornkraal, Macpherson's farm and Brinley.—No fresh cases or deaths.

Vlaakplaats.—Seven deaths and seven fresh cases.

Van Reenen's, Brakwal. — One death ; no fresh cases. Reproach : No fresh cases or deaths.

Newcastle Division.

Normandien Area.—This area is now clean with the exception of two small herds of native stock on farms Elandsklip and Doornpoort ; two deaths on former and four deaths on latter farm

Ingogo.—Two fresh outbreaks amongst native stock. The cattle have been inoculated.

Charlestown.—No fresh outbreaks reported.

Newcastle.—The disease appeared here on the 25th inst. amongst the Public Works Department oxen. The oxen have been inoculated.

Dundee Division.

Vellivreda.—Fresh outbreak reported here amongst 160 head of cattle belonging to C. Massopp ; fifteen deaths and ten recoveries. Outbreak due to inoculation with raw bile.

Krantzkop Division.

Jammerdaal.—No fresh cases.

Frogmore. Fresh outbreak reported on the 22nd. 370 head of cattle on farm in three separate troops ; one troop only affected ; fourteen dead, twenty sick. This farm adjoins Jammerdaal.

Nkandhla, Zululand.— One death, no fresh cases. The disease exists in the Transvaal, just across the border, at native kraals.

S. B. WOOLLATT,
Principal Veterinary Surgeon.

Locust Destruction.

COLONEL FRIEND ADDISON has very kindly furnished the Agricultural Department with a quantity of treacle for free distribution, for the purposes of Locust destruction.

The treacle in question is stored in bulk at the Railway Station, and farmers and others requiring any for locust destruction should apply to me.

Casks or drums will have to be supplied by applicants.

CLAUDE FULLER,
Government Entomologist.

Department of Agriculture,
Pietermaritzburg, 27th January, 1902.

Agricultural Shows.

Greytown, Thursday 29th May ; J. M. Handley, hon. secretary.

Estcourt, Wednesday, 4th June ; Herbert Blaker, J.P., hon. secretary.

Maritzburg, Thursday, Friday, and Saturday, June 26th, 27th, and 28th ; A. Whittle Herbert, hon. secretary.

Noodsberg Road, Thursday, August 14th ; F. Reiche, hon. secretary.

Sir W. F. Napier tells a curious story of the great battle of Chillianwallah. A sergeant of artillery, or of dragoons, a man of great strength and stature, got mixed up with the enemy in a charge. His horse an entire, and "one of those vicious brutes so common in our ranks," attacked an enemy's horse, and the beasts fought so furiously, biting, striking, and kicking, that the sergeant was unable to use his sword to any purpose, with the result that both his arms were lopped off.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 4th March :—

Howick.—Running on the farm Benvie, of Mr. John Geekie, bay filly, about two years old, no marks or brands. Running on the farm Shawswood, and reported by Mr. A. G. Shaw, young ox, red, with brindle patches, piece out of each ear, branded A on rump, about three years old.

Moguntia.—Young black-and-white ox. Dark-bay stallion, white star on forehead, value about £6. Impounded by Unquaqulu (native). If not claimed and expenses paid will be sold one month from date (13th January).

Dalton.—Bay mule, branded R on off hip, two wild to be let out. At present in poundkeeper's stable.

Ladysmith.—Bay pony gelding, branded A2 on the near hip, a few white hairs under saddle, about 14 hands high, six or seven years old. Black cow, branded on the right hip with broad arrow, W on leg, both ears marked swallow tail, with half tail.

Nqutu.—Bay gelding, 14.2 hands, white fetlocks, white stripe down face, lump on back from old sore, aged seven years.

Greytown.—Bay mare, small star on forehead, two hind fetlocks white, age about six years, no brands visible. Dark-brown colt, white stripe down face, small slit in right ear, branded looks like D on right hip, age about two years. Black ox, branded looks like C3 on left hip, no ear marks, age about five years. Black-and-white ox, indistinct brand on right buttock, looks like ○, right hind leg has been broken below knee, age about six years. Red-and-white ox, slit point left ear and square behind, aged, no brands visible. Running on the farm Speculation, Umvoti County, and reported by Mr. J. A. Mare as too wild to be driven to the Pound, black gelding, about 14.3 hands, age about eight years, shod all round, branded left buttock)--(. Impounded by Mr. L. J. Nel (G.'s son), Umvoti County, of farm Welgegund, black bull, white brush, little white under belly, square cut left ear, swallow tail right ear, branded ET (joined) left buttock, age about four years. Probable value £12. Will be sold one month from date (15th January) unless previously released.

Mooi River.—Dark-brown stallion, long tail, small star on forehead, about three years old, no brands or marks. Value about £10. Impounded by Mr. W. E. Oates, and will be sold one month from date (15th January) if not previously released.

Acton Homes.—Black bull, piece cut out left ear, two slits in right ear, little white under belly and flanks, branded on left leg BN. Probable value about £8. Will be sold one month from date (11th January) if not previously released.

Driving Horses Out West in 1898.

By James T. Godfrey.

I HAD, with a friend of mine and a little nigger boy of about twelve years old, a very fair experience of driving a mob of horses.

There were just two of us, not counting the boy, Jack and myself, to drive a mob of horses about 150 head, from the Grant to the Home Ranch, a distance of about 100 miles. On the way we had to pass the Sacramento River, which is about 50 yards across, and has a quick and strong current after the rains. We started at about three o'clock in the morning, just as it was getting light enough for us to see our way about a bit. All went well until we reached the river. Then came

the trouble; the horses did not like the look of the ford, as the river was running swift after the recent rain. We had a try for some time to get the horses to cross, but with all our yelling and lashing, it was all we could do to go after and turn those of the horses that broke away from the mob. Then to make things worse the rain began to pour down. Then after a time the rain changed to hail, which so maddened the horses that they stampeded. It being no good to try and stop them, we followed until such time as they quietened down a bit. At last, however, we turned them and managed to get them back to the ford.

Both of the horses we were riding were so done up that we could get nothing more out of them. Jack said he would go and lasso a couple of the mob (which were all unbroken). He managed to get the leader of the mob—a big black stallion. I got a bay mare and tied her up to a tree, and after some time I managed to get the saddle and bridle on. With the help of the boy I then mounted her, but was no sooner on than she gave a buck, and I went flying. Jack was watching and burst into a peal of laughter. That made me wild, so when I got on her again I kept on the watch, as I knew what to expect. After several nasty standing bucks through which I managed to cling on with my knees, she started at a sort of galloping buck, that I did not find an easy gait. After a mile or so she quietened down a bit, so turning her round I ripped my Mexican spurs into her, which so livened her that I could hardly keep my seat. At last I got back to find the camp for the night laid out, and everything ready, Jack standing with his black stallion nearly dead, and as quiet as a lamb. That night we spent on the watch; one of us at a time. Early next morning we started the horses towards the ford, and tried to drive in the horses by setting fire to the grass behind them, but the grass was too wet. However, at last, somehow or other we managed to get the troop across, and we got all our things soaking wet in the river. But Jack knew a few things, and had brought a powerful burning glass, and with it we were able to get a smoke. Towards mid-day we had the horses going along nicely, when all at once they one and all stopped. We could not imagine why, so I rode round in front of them, and found a big block of white stone standing up in the middle of the road or track, which had frightened them. I told the boy to stand his horse in front of it, and to lie down on his horse's back so that the horses would not notice him or the stone. This plan succeeded, and we got the horses past and sent them along at a trot until about three o'clock, when we stopped to change horses for the ones we had broken the day before, and have a cup of tea. The tea tasted very good after all, although it had been wetted in the river. After an hour or so we started again, and at last we got to a public-house where there was a wayside corral, into which we put the horses. We then went inside and had a drink and some food, after which we camped down by the corral gates for the night. Next day we started early, and arrived without much trouble at the "Home Ranch." On the day following we got our cheques and went into Sacramento on the spree for about a week, and then returned to work again.

I hear that my friend Jack is still driving horses, but he has a wife now.

A correspondent writes to the "Daily Express." stating that he knows of a well-managed and productive farm, within twelve miles of London, entirely tilled and managed by Italians. The farm hands receive 8s. a week wages, exclusive of board and lodging. They have a room for recreation, and are forbidden to attend the village alehouse.

The Gruyere cheese factories in the east of France cover six departments, five of which are situated on the Swiss frontier, and the quantity made has increased from 15,000 tons in 1882 to 18,500 tons in 1892. It is now estimated to reach 25,000 tons, which, at the average price of about 5d. per lb., represents an annual value of £1,200,000. The Gruyere cheeses are always made large, the average weight being 88lb., while in Switzerland, where the cheese is known as "Emmenthal," they usually weigh 220lb. each.

The value of salt for sheep is shown by an experiment in France, where of three lots of animals fed alike on hay, straw, potatoes, and beans for 124 days, one lot had no salt, one had ½ oz. of salt, each every day, and the other had three-fourths of an ounce. Those that had ½ oz. gained 4½ lbs. each more than those which had no salt, and 1¼ lbs. more than those which had more than a ½ oz. So it seems that too much salt can be given as well as too little. The salted sheep had 1¾ lb. more of wool and a better fleece than those that had no salt, showing better results in the wool; that is, larger profit than in the flesh.

Farming in the Transvaal.

A CORRESPONDENT kindly sends the enclosed for publication; it is extracted from a Johannesburg letter to the "Daily Telegraph," and appeared in August, 1899:—

The position here is that of England reversed. You see it in the scenery. At home we have too little sun, but the moisture-fed grass or tree, moss or lichen, creeps up to the very summit of the hills; here dark, treeless, verdureless rocks stand out against the unpitying background of a blazing firmament. In the British Islands one looks too often on a dull, heavy sky, with the unpleasant reflection that the sunshine which the land wants is shedding fantastic beauty and glory on the upper side of the canopy of cloud. It may be the task of science to show us some day how to rend that veil. Possibly a ballon in electrical communication with the earth might open a way through the clouds, which are often charged like so many Leydon jars, and let down light and heat. Arago used such an instrument, the paragrêle, in France to prevent hailstorms. Here the task is to get the rain, and having got it to keep it. Miss Frances Macnab, who has written so learnedly on African agriculture, tells a story of a Scotch parson who was approached by his Presbyterian congregation with a request that, in view of impending drought, he would address the Lord on the subject of rainfall. "No," replied the sturdy Scot, "I will not insult the Almighty by asking such a favour of Him after the way in which you have let His past mercies run away from you." That was sound theology and exactly suitable to the South African. When water fails he prays and proclaims a fast day, forgetting that his indolence has allowed hundreds of millions of tons to run to waste, carrying with them to the ocean the finest elements of his soil. The poor kafir resorts to incantations, the Boer to prayers. How much more rational is the Reformed Dutch parson than the rain doctor? If, instead of spending a million pounds on forts at Pretoria and Johannesburg to keep out the English and mayhap to overawe them, the Government of this Republic had devoted the money to wide-reaching works of irrigation, thus allotting the temporary revenues drawn from the goldfields to measures of permanent value, they might have helped the "arme Boer" in the fearful crisis through which he is passing; but that is a policy yet to begin.

Where Nature has provided storage or permanent supplies, there and there only they exist. Now and again in travelling through the country you will see a dam across some small valley, holding back enough water to serve through the period of drought; if the wet season fails farmer and cattle suffer. One may be permitted to doubt whether stagnant and polluted pools, exposed to an African sun for several months, provide quite the right fluid for even cattle to drink, and whether this may not be one of the sources of the many diseases to which all kinds of stock are subject in this country. In presence of man's perverse negligence Nature has made an immense amount of underground reservoir provision in these lands. In the first place, the limestone rocks, with their stalactite caverns, are natural cisterns that never fail. Between here and Pretoria are great layers of dolomite, or magnesian limestone, from which, at a height of over 4,000 ft., issue perennial streams that supply the capital and might irrigate many square miles. Needless to say, most of it runs wholly to waste. Close to Pretoria the hills enclose a deep valley that could easily be made into a lake, if one had fancy enough to imagine an intelligent Government in that capital. Such a lake would be a thing of beauty, as well as a grand reservoir. Moreover, the soil of this sun-dried, flood-wasted, and frequently sandstone surface is extremely porous, and you can hardly sink a drill anywhere without finding water. At Elandsfontein, on a hill-side, is a small windmill, pumping up hundreds of tons of water, and serving the adjoining township and hospital. It never fails, yet it is difficult to see where the supply comes

from. All over the country about Johannesburg are hundreds of little mills of this sort, erected by Uitlanders.

By planting trees the storage might be indefinitely increased. One of the most successful and gratifying things our people have done in these regions is the arboriculture. Eleven years ago the eye searched the horizon in vain for a green leaf. It was as bare as if the hoof of the Sultan's horse had trodden the spot, "where tree ne'er grows, nor fruit, nor flower." Now you find millions of trees, many of them thirty or forty feet high—a rate of growth almost unprecedented. Five years ago Mr. Phillips and Mr. Creswell, of this city, hired lands of the Goldfields Company, on which they formed plantations. They have already sold the same company timber to the value of £4,000, and they have more standing worth probably twice as much. Millions of trees, pines, blue-gums, or eucalyptus might be planted on the hill-sides to milden the climate, enrich the soil, and improve the water supply; but the Boers don't plant trees. What is, perhaps, more remarkable in the way of natural storage is that, even in the Karroo and the Kalahari Desert, water can almost always be found at a moderate depth. The explanation seems to be that the heavy rains, when they can come, carry downward whatever of the clay or humus they do not wash away, and that this sediment forms a water-bearing layer, from which supplies can be drawn during months and even years of drought. Instances have been known where this stratum was scarcely thicker than a penny-piece, and the water-finder is very careful not to pierce it. It remains only to add how amazing is the fertility where there is water. A few days ago I visited the homestead of Mr. Cooke, on the northern slope of the ridge of hills near this city. This gentleman bought some hundred acres, of which sixty are under cultivation. It is now the depth of winter, but I found growing acacias, wattle trees, and grape vines, cabbages, peas, cauliflowers, green barley for horses and cattle; almond trees were in blossom; oranges and lemons were ripening. As there is perennial sunshine, growth never ceases. Mr. Cooke made in one year £600 by his strawberries and £700 by his three crops of potatoes. His flower beds, especially his show of chrysanthemums, are a marvel. The whole secret of this luxuriance is a little, nearly invisible rill of water that issues from the hill-side, and is being unceasingly turned upon the soil. A Boer had this land previously, and he was starving, poor man, the regulation "arme Boer."

Agriculture in France.

THE "Morning Leader" calls attention to what the Government of France does for Agriculture in France: "It has established a network of agricultural instruction, and the peasant proprietor, keenly alert to every promise of increased produce, is taught how to extract the most and the best from the soil. At Paris there is a central ministry of agriculture. Upon it there are dependent professors of agriculture, who are to be found in every department of France. In many of these departments there are special professors acquainted with special branches. Thus, in a department where vine-growing is the chief object of agriculture, there is a special professor who devotes his attention to the improvement of the methods of viticulture; and so forth. Next, there is in each commune a schoolmaster, who, through his scholars, is in direct touch with the peasant proprietors. The professors make it their duty to keep in close communication with these communal schoolmasters; and the latter, receiving their lessons from the professors, impart them in turn to the peasants, through the medium of the children or by means of conferences. Further, a plot of ground is attached to the communal schools in rural districts, on which the schoolmaster makes experiments with various manures and varieties of seeds for the instruction of the farmers. Nor do official efforts end here. Experimental fields, as well as fields on which the ascertained effects of the experiments are demonstrated, are established; competitions among farmers are organised, and medals, diplomas, &c., given for the best results in the employment of improved methods of agriculture; and, in fact, a well-organised and sustained effort is made by the Government to strengthen the tillers of the soil by means of greater knowledge and skill."

Agricultural Chemistry for Beginners.

CHAPTER VI.

By Archibald Pearce.

THE PHOSPHATES.

Superphosphates.

ALTHOUGH it was shown that by means of acids the insoluble phosphates can be brought into solution, this is not an example of the simple kind of solution that takes place when sugar dissolves in tea, for instance, or salt in water, where no chemical change occurs; in reality the acid seizes on some of the calcium, and the phosphate becomes converted into the mono-calcic variety. This is the principle upon which the so-called superphosphate is made. The tri-calcic phosphate, usually in the form of mineral phosphate but sometimes as bones, animal charcoal (which is only charred bone), or guano, is ground to a fine flour, and treated with the proper proportion of sulphuric acid; the hydrogen of the acid and two portions of the calcium of the phosphate change places, and the result is mono-calcic phosphate and calcium sulphate (sulphate of lime); and when properly dried we have the well-known superphosphate of commerce. When made from bones, it is called dissolved bones; and when partly of bones and partly of mineral phosphate, dissolved bone compound; but even dissolved bones are generally made with a small proportion of mineral phosphate, as pure bone superphosphate is apt to be pasty and difficult to dry, or the difficulty is avoided by only converting a portion of the bone into superphosphate. Most of the mixed or "special" manures have superphosphate as their groundwork or basis, other ingredients being added to suit the special needs of the crop for which they are manufactured. The great value of this product lies in its solubility, which makes it the quickest acting of all phosphatic manures; the rain carries it about in the soil, and so wherever the roots penetrate they find their food ready for them. It is especially suited for soils rich in lime, and on such it is probably the best phosphatic fertiliser.

Di-calcic Phosphate.

If superphosphate is brought into contact with lime it is converted into the di-calcic form, which pure water will not dissolve. It is, however, readily soluble in very weak acids, and in consequence is probably just as easily taken up by plants as the soluble form; but it has to a great extent lost its power of diffusing through the soil. Also when superphosphate is kept in stock for some time, the amount of mono-calcic phosphate contained in it is found to gradually diminish, a certain proportion of di-calcic phosphate being formed in its place. This latter is, therefore, often called reduced or reverted phosphate, and the manure is said to go back. Practically there is little if any loss of value through this action; in fact, farmers sometimes produce the reduction artifically. The reduced phosphate is much less liable to be washed away from light soils than the more soluble superphosphate, and so it is easy to see that in some cases it is preferable. A useful method of reducing superphosphate is to mix it with about one-third its weight of bone dust, and moisten the mass slightly, turning it over occasionally for five or six weeks. In this way some of the bone phosphate reacts on the superphosphate, and both are converted into the reduced state. Such a mixture is often better than either of its ingredients on soils with little lime in them. Instead of bone-dust we may use the same weight of basic slag; a thorough mixing must be given, and the manure can be used at once. When an analyst, in reporting on a manure, speaks of citrate-soluble phosphate, he is referring to the di-calcic variety, a weak solution of citric acid being the nearest way yet de-

vised of imitating the solvent powers of root-juices, and so distinguishing this phosphate from the other two.

Basic Slag.

An irregular form of calcium phosphate occurs in basic slag or Thomas' phosphate, which is not constructed in either of the forms already mentioned, and is perhaps not found in any other substance. Up to the present it has hardly been thoroughly investigated, but appears to be partially soluble in citric acid, and upon the amount so soluble the value of a sample largely depends. It is usual to give only the total amount of phosphoric oxide present in an analysis of this manure, but it would be better if the citrate-soluble portion were also estimated. Basic slag is a by-product in the Thomas-Gilchrist process of steel-making, and is not a single chemical compound, but a mixture of several; accordingly, the percentage of phosphoric oxide is not strictly defined, but varies in different samples from 15 to 20 per cent. It needs to be very finely ground to be of any use.

Phosphatic Manuring.

Several phosphatic manures have been mentioned in this and the preceding chapter; it only remains to say that as a general rule phosphoric acid in one form or another is the one ingredient of fertilisers that cannot be omitted, and in some cases is the only one required. Turnips especially demand that they shall have a full supply from the commencement of their life. On soils, with a fair amount of lime in their composition, there is probably nothing better or cheaper than superphosphate, or the mixtures made from it. If the soil is poor in lime it is generally better to use non-acid manures, such as bones, basic slag, or guano; it must not be forgotten, however, that a somewhat heavier dressing of these is needed, because being less soluble the roots must have a larger quantity to act on. But the excess remains in the soil for the benefit of the next crop. If the soil has a tendency to sourness, *i.e*, acidity, basic slag should be tried, as it contains some free lime, which helps to neutralise the vegetable acids which are detrimental to plant growth.

Phosphates in Analysis.

A little explanation is necessary as to the manner in which the percentage of phosphates is given in analyses of soils and manures, as there is unfortunately a good deal of confusion, or at any rate a want of agreement, which is likely to lead to confusion. We shall probably find, if we consult an analysis, that so many per cent. of phosphoric acid and lime are given. For analytical purposes it is much the most convenient plan to consider a salt as made up of an acid-forming oxide and a basic oxide, and we have seen that salts can be formed in this way, though it is not the most scientific way to look at it. Moreover, it has been the custom, handed down from the darker ages of science, to speak of this acid oxide as the acid itself, which is certainly incorrect. Therefore, when we see phosphoric acid in an analysis, we must understand that phosphoric oxide is meant; and in some places, the Cape, for example, the correct term has been brought into use. Another plan formerly common, and still adhered to by manure manufacturers, is to reduce all phosphates to the equivalent quantity of tric-calcic phosphate. If, for instance, a superphosphate is said to contain 30 per cent. of soluble phosphate, this does not mean that there is 30 per cent. of mono-calcic phosphate, but that if the mono-calcic phosphate were converted into tri-calcic phosphate, there would be 30 per cent. of the latter. No doubt the larger figures look better; but the method appears to be one of those "trade customs" which are not always understood by the ordinary purchaser. If the average farmer has the choice of two manures, one stated to contain 36 per cent. of soluble phosphate and the other 20 per cent. of soluble phosphoric acid (or oxide), the odds are he would choose the former; yet a little calculation with the figures given below will show that 36 per cent. of tri-calcic phosphate is only equal to about 16½ per cent. of phosphoric oxide.

The factors necessary for the comparison of phosphoric oxide with the phosphates are as follows:—

One part of phosphoric oxide equals 1.648 parts of mono-calcic phosphate.

One part of phosphoric oxide equals 1.915 parts of di-calcic phosphate.

One part of phosphoric oxide equals 2.183 parts of tri-calcic phosphate.

One part of mono-calcic phosphate equals .607 parts of phosphoric oxide.

One part of di-calcic phosphate equals .522 parts of phosphoric oxide.

One part of tri-calcic phosphate equals .458 parts of phosphoric oxide.

QUESTIONS.

1. Explain what superphosphate is, and how it is made.

2. What sort of soils is superphosphate best suited for, and why does it act so quickly?

3. What is the action of lime on superphosphate?

4. What is the object of mixing superphosphate with bone-dust?

5. Mention a crop for which phosphates are a prime necessity.

6. If a sample of bone-dust contains 20 per cent. of phosphoric oxide, how much tri-calcic phosphate will it have?

7. What is basic slag? Why is it so good for sour soils?

8. Explain exactly what is meant by soluble phosphate in an analysis. If a special manure is said to contain 25 per cent. of soluble phosphate and 5 per cent. insoluble phosphate, calculate the amount of phosphoric oxide in each. (Answer: 11.45 per cent. soluble, and 2.29 per cent. insoluble phosphoric oxide.)

Rinderpest.

BILE INFECTION.

THE following letter appeared in the "Natal Witness." It is in reply to an article by Mr. Pitchford, in No. 20, Vol. IV., and reproduced by the above journal:—

Sir,—In your edition of December 11th an interesting article on rinderpest is published, written by Mr. Watkins-Pitchford, in which, in discussing the possibilities of communicating rinderpest by the inoculation of rinderpest bile, the following sentence occurs:—

"Although later the same authority (Turner) is reported (perhaps incorrectly) as admitting that the question whether the gall can cause the disease is still an open one."

This is certainly incorrect; the question as far as I am concerned, has never been doubtful. If there is one fact which is well established with regard to rinderpest it is that rinderpest gall does not *per se*, usually, or even frequently, convey rinderpest. I should say that it never does so, only I do not like to make an absolute statement with regard to a matter of this nature. Certainly I have never met with such an occurrence, and have never heard of rinderpest being spread by gall where there was any reasonable certainty that the animals were not previously infected. I held this opinion in 1897, and my experience during 1901 has only made me still more convinced of the truth.

I do not say that rinderpest has never followed bile inoculation, for this has frequently occurred. Sometimes the disease has been directly caused by the bile inoculation. Not by the insertion of the gall, but by want of care and cleanliness in the operator. Koch recommended that the inoculation should be made from the clean area towards the infected centre, because he was aware that the gall was not only curative, but that until the tenth day it was not preventative. If a series of animals are all infected with gall, and then rinderpest blood is administered to one animal of the series daily until the whole have been inoculated, it will be found that while, in exceptional cases, where the bile is inert, all may have the disease, that those inoculated with blood up to the sixth day after the injection of bile will certainly suffer; that those infected on the eighth day may have the rinderpest, but that usually those tested on the eighth and tenth days escape.

This being the case, any one animal in the herd which has been infected will

certainly suffer after bile inoculation, and unfortunately it will infect others previously uninfected until about the eighth day after the bile treatment. Nothing is more difficult—nay, more impossible—in an infected area, than to be sure that any particular herd or animal is clean. During the incubation period, *i.e.*, four or five days, this is absolutely impossible, and during the first three or four days of the fever, the only suspicious circumstances which could be noticed would be an abnormally high temperature. Thus from a period of from seven to nine days after infection, it would be difficult, and by an ordinary inspection impossible to give any opinion as to the condition of a herd with regard to rinderpest infection in any infected area. Yet those who believe in the infectivity of rinderpe t bile, base their belief on experiences gained in an infected area under the conditions such as I have just described. Even the fact that the same bile used on the same day in different herds is credited with different results does not convince them that the experiences on which they rely are not trustworthy. Thus in two or more herds inoculated by the same operator, on the same day, and with the same sample of bile, I have more than once known rinderpest to occur afterwards in one herd and not in the other, and sometimes the infected herd has been very considerably smaller than the uninfected.

I was afforded an opportunity to test the possibility of bile infection on a fairly large scale. I was allowed to inoculate 160 animals near Britstown, which were then supposed to be free from disease. Speaking from memory, ten samples of bile were used, yet not an animal was infected. The most extraordinary fact with regard to this experiment, and one which will illustrate the difficulty of offering any opinion as to the freedom of a district or herd from the disease is the following:—On July 13th, when I operated at Britstown, there was no known case of the disease, nearer than Prieska, several hours distant, yet it was next heard of on a farm half way between De Aar and Britstown. In fact the first report which reached me was that the animals I had treated had been attacked. It was simply a matter of chance that the herd at Britstown had not been infected before that at De Aar—three hours further from the nearest known infected centre. Had this occurred no one for a moment would have doubted that the disease had been conveyed by protective inoculation.

My recent experiences have been as follows: In Basutoland, an infected area, rinderpest has followed inoculation in some cases. In Pretoria, where it is true the disease was present but not widely spread, we have inoculated 338 clean animals with 22 different samples of bile, and rinderpest has not once resulted. It is true some of the oxen thus treated have since had rinderpest, but only after the bile immunity has worn out, as it sometimes does, a few months after inoculation. Anyone interested in the matter will find the facts on which I rely for my opinion, in the "South African Medical Journal" of November, 1897, and in a small pamphlet entitled "Rinderpest Investigation," September 11th, 1897, published by the Agricultural Department of the Cape Colony. There is another remark upon which I should make some observation. Mr. Pitchford says, "In arguing upon this inhibitive or restraining power of rinderpest bile, Koch went so far as to suggest that bile from quite healthy cattle could so modify the virus of rinderpest blood that a useful vaccine could be produced thereby." I have heard Koch make a similar statement. He proved that ordinary healthy bile could destroy a small quantity of rinderpest bile, and, acting on his suggestion, I have shown, first, that it is possible, by the action of bile on rinderpest blood, to produce a mild disease from which the animal recovers; and, second, that the bile exerts this power by the action of the taurocholate and glycocholate of soda contained in it. Whether a useful vaccine could be made in this way I am unable to say, because early in July, 1897, the possibility of producing a powerful serum was practically assured, and I gave up experimenting with bile.

The experiments of Messrs. Nencki, N. Sieber and Wyznikiewiez, described in the Central Blatt fur Bakteriologie Paristenkunde, und Infectious Krankheiten, of March 31st, 1898, have been repeated, but, as was to have been expected the results described by them are not to be

obtained. I am under the impression that they went even further than to state "that animals inoculated with the bile sometimes contracted the disease in a fatal form." I believe (unfortunately I cannot refer to the original) that their assertion was tantamount to a denial of all protective action, and an assertion that the disease was conveyed by the bile. Dr. Krause was at first a strong supported of Koch's opinion as to the impossibility of conveying the disease by rinderpest bile. He then met with an unfortunate experience, against which he had been warned, should he operate in an infected area, and without any attempt at serious investigation he veered completely round. The matter, however, is not of much immediate importance. Koch's discovery has been of incalculable value, but we can now produce serum which is more handy and more efficacious, and for the present there is no need to fall back upon the bile. Quite recently, also, it has done good service, and would have done more had not the ungrounded fear of spreading the disease prevented its proper appreciation. Probably in the future it may again be necessary to fall back on the bile, and then I hope it will be practised as the inventer intended, and in the only way in which it is capable of producing its full effect, viz., by inoculating in clean herds to produce an immune cordon.—I am, Sir, yours obediently,

GEORGE TURNER.

Pretoria, Dec. 27th, 1901.

Mapstone Oats: Further Reports.

AUG. KOHRS, MIDDLEDRIFT, SEVEN OAKS.

UNDER date of 9th January, Mr. Kohrs reports as follows:—The sample of Mapstone oats—60 lbs.—was poor looking seed. It was planted on the 21st of March, 1901, covering half an acre of ground, manured with 150 lbs. of Fison's corn and hay fertiliser. During the winter it was irrigated four times, and the crop was reaped 28th October last, yielding 568 lbs. of good seed, and 1,800 lbs. of straw.

Adjoining the Mapstone oats, half an acre was put in with Algerian oats. This received exactly the same treatment, and yielded the same results to within a few pounds.

As I feel sure that there is no difference between Mapstone and Algerian, I am sending samples of both, and hope for a report upon the subject.

The elevation of the farm is about 3,600 feet, and I have noticed that the Mapstone oat ripens about 10 days earlier than the Algerian, when the latter is grown from imported seed. In further evidence of this, I might observe that the Algerian crop, from seed produced here in 1900, was in ear before the imported seed of the same variety. This, and the fact that when growing no one could see any difference between the two oats, confirms me in my opinion that they are one and the same. The earlier ripening of crops from locally raised seed has also been noticed by a friend of mine.

Regarding the Algerian oats planted upon my farm, this has run to about 5,000 lbs. to every bag planted, and turned out real good forage with no rust.

In both the Mapstone and Algerian crop a little rust could be seen in the ripening stage. Cape oats planted under the same conditions last winter gave 2,000 lbs. of forage to every bag planted, and they rusted very much. I might add that rust was at its worst on all oats planted here in 1900.

The affinity noticed by Mr. Kohrs between the Mapstone and Algerian oats has been remarked upon by other farmers, and it is impossible from a cursory examination of the samples submitted, both of seed and straw, to pick out any distinctive characteristics. Attention is, however, drawn to the accompanying report of Mr. Mapstone's, which has been written at my special request.

So far as the producing an earlier ripening crop by locally raised seed is

concerned, I may state, upon the information of the Principal of the Cape Agricultural College, that similar observations have been made at the Elsenburg farm. —C. FULLER.

W. MAPSTONE, THORNVILLE JUNCTION.

To fulfil my promise to write you regarding the Algerian and our own oats, I will commence with the Algerian. On the 18th January, 1901, we sowed about eight acres of these oats, and harrowed them in. They came on very well until May, when rust appeared very badly in them, and as a consequence they died away nearly to the ground, although they were over two feet high. With the beautiful early rains they shot up again, and we began cutting on 16th October. It was, however, a very poor crop, and full of dried straw caused by the rust. This necessitated cleaning the hay before sending to market, and in so doing about half the weight was lost. As a consequence we considered the crop, to a great extent, a failure.

On 26th March we sowed and harrowed in 250 lbs. of our oats, *i.e.*, the oats called after us, and upon the same day we planted a field of Algerian alongside, and another strip through the middle of our oats. This was done so that we might compare the two kinds during their growth, for, as you know, there is a great likeness between the two. All came up very well, but in a month from planting the Algerian shot up three to four inches above the Mapstone, which were then almost flat on the ground, and stooling out very much. By 1st May, rust made its appearance in the Algerian, but not in the Mapstone. With the first few sharp frosts, however, the Algerian recovered itself to a great extent. The Mapstone oats were ripe for harvesting by 20th November, the 250 lbs. of seed yielding about seven tons of forage. The Algerian was ready for cutting a fortnight later and gave a very fair crop, but in both cases the crops would have been much heavier could we have irrigated. We notice that the Algerian takes longer to dry when cut than the other, and that it had a little smut in it, which we have never seen in ours during the five years we have had it.

I may mention here that in all these cases the oats were planted after a mealie crop, for which the land had been bone-dusted.

We also planted about 30 acres with Algerian oats in another field between 1st and 12th February last. These suffered rather much with rust, and when harvested we had to clean the dead straw before tying into bundles.

J. A. F. ORTTLEPP, VLAKBULT, ZULULAND.

Writing on the 4th of January Mr. Orttlepp says :—I am glad to be able to inform you that the 25 lbs. of Mapstone oats received from the Department early last April has proved itself to be a thorough success, considering the results all round. The 25 lbs. was distributed amongst five farmers in equal parts, all but one lot of about 9 lbs., and I have no hesitation in saying that we have in the Mapstone oat a thorough, all-round, valuable oat. The five lots were sown at different altitudes, that sown at the lowest (2,000ft.) was simply perfect ; others sown at the highest (about 3,000ft.) were very much affected by rust when seeding.

Altogether the 25 lbs. were sown on 1¼ acres of land, yielding, as near as I can gather from the information received from the parties to whom I supplied seed, after repeated requests for written statements without avail, 1,158 lbs. nett seed, and 3,322 lbs. of straw. All had to irrigate, and are highly satisfied with the general qualities of the forage.

The following is the result of my trial of 9 lbs. of seed planted on my farm, Vlakbult, altitude 3,000 feet ; sown on the 9th April on well cultivated, fine soil. The plot, 2-5ths of an acre, was heavily manured with kraal manure last year, and planted with potatoes previous to the oats. The ground was well ploughed just after a good rain, seed sown and harrowed in, after which carefully hand-raked and cross furrowed for leading water ; no rain up to the 27th, when the field was well irrigated. Splendid rain on the 7th May, also on the 19th, 21st, and 24th May. June rather dry ; watered twice. Irrigated during July ; looking fine and stooling well. Sufficient rain during August. September wet ; too much rain, showing rust in some parts. October the

same, rust affecting the whole plot (*Puccinia* form of rust , which is fully in ear, standing quite five feet high, nice, level, and close together, having stooled beautifully. Consequent upon light and overmuch rain during October, nearly half was forced down on to the ground and rotted.

On the 18th November the crop was dead ripe and rusty, taking over seven months to ripen ; notwithstanding, I consider it a splendid oat ; it certainly is a first-class substitute for the old Cape, and though not rust-proof, is certainly entitled to be considered the best rust-resistant oat in the Colony, and no doubt all farmers will fully appreciate the action of the Agricultural Department in so promptly and liberally distributing the Mapstone oat, and I would, on my part, thus tender my thanks.

W. J. Fly, Boston.

Mr. Fly reports as follows :—I received 25 lbs. of Mapstone oats from the Commissioner of Agriculture, for the Boston Farmers' Association. Having only one application for the oats, I divided them, and kept 12½ lbs. These I planted on the 19th January, 1901. The oats were planted very thinly on about a quarter of an acre, with one cwt. Fison's fertiliser. Alongside of the Mapstone oats I planted one bag of Sidonian oats. The latter came along very fast, and looked well until just before they commenced to come in ear, when they rusted very badly, and wet weather coming on, they nearly all died down before I could cut them.

The Mapstone looking well, with no rust at all visible, and kept green and looked splendid all through the winter, stooling out wonderfully. In August I cut them, and fed green to my cattle. In the spring they came on well. On 5th January I cut them, and thrashed out two full muid sacks, weighing about 130 lbs. each. The straw, a full cart load, I did not weigh. These oats, I consider, should be sown not later than 20th December. January is too late for this district, I think. The Mapstone oats, I think, resemble the old winter oats in every way, keeping green all through the winter months.

The oats were planted on very light red soil (poor), which had previously been planted with turnips, fertilised with Fison's Root Fertiliser.

A. W. Smith, Howick.

Mr. Smith reports having sowed 50 lbs. of Mapstone oats upon three-quarters of an acre, the ground having been manured with 4 cwt. of Basic Slag.

The oats were put in on 12th April, 1901, and reaped 21st November.

No rust at all appeared in the crop, and 1,400 lbs. of seed and 2,850 lbs. of straw were reaped.

T. Braithwaite, Hartebeeste-fontein.

Under date 18th January, Mr. Braithwaite writes as follows :—I beg to report as follows on the 30 lbs. of Mapstone oats received by me on January 7th, 1901.

I sowed 15 lbs. of the oats on January 8th, on well prepared but not rich ground. The oats were at the shooting stage of their growth when the first severe frost occurred. They were killed to the ground, but immediately began to grow again, and in July were fed down, and again by sheep—this time unintentionally —in the beginning of September. They were reaped December 18th, and were a fair crop, about 20 inches long. Algerian oats, grown alongside of them, and having had identically the same treatment, were a slightly better crop, being four inches higher. Both were clean of rust. Mapstone ripened eight days before Algerian. Both were irrigated before being eaten off the first time. The remaining 15 lbs. of seed I sowed on September 7th, and reaped December 18th. They were on fairly good light land and were a good crop, about three feet high, and were ripe about four days before Algerian, alongside of them ; were clear of rust until ready to cut for forage. Before they were ripe enough for seed the leaves became rusty, but stalks remained intact. When I made the last sowing I sowed also in the same field Tartarian, Sidonian, Cape and Algerian oats. The Tartarian rusted off and were not reaped. The Cape and Sidonian I had to reap before they were ready to prevent their sharing

the same fate. If I might offer an opinion it would be that the Mapstone and Algerian oats originated from the same stock, but the Mapstone having been grown in Natal a few times, climate and environment have had the effect of making them ripen a few days earlier, slightly imparing their hardiness.

I think that they are both equal to our old winter oat for sowing in winter for grazing, and whoever has enough of one of the two need not wish for the other.

Queensland Cattle.

THE INTERVIEW WITH MR. BOOKER.

A PROOF of the interview published in the last issue was sent to Mr. Booker for correction, but owing to Mr. Booker's movements, it unfortunately was not returned before the *Journal* had gone to press.

The tick dip should be as follows :—

Water ...	...	400 galls.
Arsenic ...	...	6 lbs.
Washing Soda	...	24 „
Common Soap	...	24 „
Stockholm Tar	...	5 galls.

The mixture should boil for six hours.

The tick-infested, or redwater, division of Queensland is the north and east of the Colony.

The gentlemen sent to America to investigate the redwater discoveries were the late Dr. Hunt, Pathologist to the Agricultural Department, and William Collins, a well-known cattle breeder. The result of the visit was very satisfactory. The Queensland Agricultural Department took the matter up earnestly, and placed Dr. Hunt in the north of the Colony, and Mr. C. J. Pound in the south. These gentlemen carried out extensive inoculating experiments under local conditions, and both proved the efficacy of the system when properly carried out.

New Rinderpest Notice.

MORE FAVOURABLE TERMS FOR INOCULATION.

IT is hereby notified, for general information, that owners sending in to a Bile Station five per cent. of their cattle will receive sufficient glycerinated bile for a double inoculation, and will be refunded, in cash, half the value of the cattle sent in, at a price not exceeding £10 per head. The cattle will be valued on arrival at the Station ; the owner should be present if possible. The cattle sent in should be between the ages of three and four years. The Department reserves to itself the right to refuse unhealthy or unsuitable cattle. Three shillings (3s.) will now be charged for each single dose of glycerinated bile of 15 c.c. The Veterinary Department will not guarantee a supply of bile for cash ; owners should send in the percentage of cattle. A refund will be made to all owners who have already sent in cattle, or purchased bile at 5s. a dose. Should any owner wish to send cattle to the Bile Station at Besters (farm Spitzkop) for treatment by the serum method, full particulars under which such cattle will be received may be obtained upon application to me. A charge for serum used, and grazing, will be made ; the owner must supply the necessary labour.

S. B. WOOLLATT,
Principal Veterinary Surgeon.

Principal Veterinary Surgeon's Office,
Pietermaritzburg, 25th January, 1902.

Photo by Editor

Litchi Tree.

THE Litchi tree, of which the above is an illustration, is deserving of much more attention than it gets. The tree represented is growing in the Botanic Gardens, Durban, and the following information is gathered from the Curator, Mr. J. Medley Wood, A.L.S. :—The tree is a native of Japan and Southern China, and the late Colonel Vaughan, R.A., was of opinion, from what he had seen of it in China, that it would do in most parts of this colony. Messrs. Wilkinson and others in the neighbourhood of Maritzburg have specimens which are doing well. Last year the above tree bore 3,000 fruits, and in Durban the fruit sold readily at from 9d. to 1s. per doz. Threepence per doz. would pay well. In its native state the tree is found on river sides, and when cultivated away from streams, watering is necessary during the flowering and fruiting season. The tree is some twenty feet in height, and the fruit ripens in December and January. The timber is of no commercial use. The fruit is about the size of a walnut, and is covered with a brown, rough, wart-like shell. The inside is filled with an almost transparent sweet, stiff pulp, enclosing a brown seed. The tree may be propagated by seed, but such trees will not bear for twenty or thirty years. If propagated by layering, fruit will appear from the third or fourth year. The layering is from branches, and not from roots. A piece of bamboo, of about fifteen inches in length, is split down the middle, and this casing, filled with earth, is bound round a suitable branch. The bamboo supports of these layering boxes are clearly seen in the illustration. As may be supposed, the young trees are somewhat expensive, 10s. being a common price. Purchasers should insist upon the planting-out into the soil of the plants before acceptance, because not a small percentage fail to live after severance from the parent tree.

The Florida orange crop is estimated for 1,000,000 boxes this year.

Indigo.

INDIGO MANUFACTURE.

Suggestions by Professor Rudolf.

THE following extract is taken from a series of articles contributed to the "Bulletin of Pharmacy," by Professor Norman S. Rudolf, M.Sc., F.I.C. :—

For the sake of clearness, it will be well to divide the manufacture of indigo into seven stages, as follows :—

1. Steeping : The extraction of the indigo dye in the form of soluble indigo, or from the green plant (indican).

2. Beating : The oxidation of the soluble indigo (indican) by agitation of the solution and consequent precipitation of indigo-blue.

3. Settling : Allowing the precipitated blue-indigo to fall to the bottom of the vat.

4. Boiling : Raising the *magma* of indigo and water to such a temperature as will destroy the ferment, and at the same time cause it to filter readily.

5. Filtering : The removal of the superfluous water, leaving the colouring matter as a paste.

6. Pressing : Compression of the paste into large slabs.

7. Preparation for the market : Cutting the slabs into cakes, stamping factory mark, drying, brushing, and packing in boxes.

Steeping.—The indigo plant as it arrives from the fields is packed carefully into cisterns or "vats." These vats, which have a capacity of from 1,000 to 2,000 cubic feet, are constructed of solid brickwork, with a thin coating of Portland cement, and are built in a range containing from five to twenty-five vats. Each vat, after filling with plant, is flooded with water at ordinary temperature, the mass of plant being prevented from rising and swelling by bamboos with heavy logs of timber placed across them and securely fastened at either end by pins. The vat is provided with an outlet so situated that by it the whole of the water may be drained off ; this circular opening has been previously closed by a large plug of wood with hemp packing, or in some factories a kind of valve is in use. The first effect of the addition of the water is to cause all the animal and insect life lodged among the plant to make its escape from drowning, a circumstance which not infrequently renders the close observation of a newly filled vat an unpleasant task to the observer. During the first hour or so the water has not much effect upon the plant. The water extracts a little chlorophyll, and a quantity of bubbles come to the surface which analysis has shown to consist of air and oxygen gas, which is to be expected. From the third to the seventh hour more chlorophyll is extracted and some indican goes into solution. Towards the end of this time the extraction of the latter proceeds with great rapidity, the liquid turning yellow. During this period a large evolution of gas takes place, and in consequence of the bubbles becoming entangled in the mass of plant the surface level rises a few inches. Under favourable circumstances the extraction should be complete, the evolution of gas finished, and the surface level of the vat commence to fall, about the eleventh or twelfth hour of steeping.

There are several simple methods in use for deciding when the steeping process has gone far enough. The liquid should be of a golden brown colour ; the surface undisturbed with thin film of indigo-blue appearing at the corners. On agitation with a whisk of plant the foam has a peculiar and characteristic appearance. The gas which is evolved during the process consists principally of a mixture of marsh gas and hydrogen with a little air, the bubbles exploding when ignited.

To determine the exact chemical reactions that underlie the steeping process is not an easy matter. Various views are held on the subject, but the point to determine seems to be whether it is a case of simple extraction, with an entirely independent fermentation taking place at the same time, or whether the production of the indigo is dependent upon the fer-

mentation. For several reasons the writer is inclined to think that the first theory is nearest to the truth, for a small quantity of bruised plant gives up its colouring matter in half an hour or so when steeped in water at ordinary temperature ; again, with hot water (140°F.) the extraction on a laboratory scale is a matter of a few minutes. These facts militate against the theory of the indigo being obtained by a fermentation process. The fact, however, of the fermentation and evolution of gas coming to an end about the time when the whole of the colouring matter is extracted appears to be more than a mere coincidence. The addition of antiseptics to the vat causes the fermentation to be much less violent, but this may simply mean that the ordinary rapid decay which takes place in a wet mass of plant in the tropics is prevented.

A great many attempts have been made and a number of processes patented for the improvement of the yield and quality of the dye by the addition of chemicals to the steeping-vats : among others may be mentioned ammonia and its salts, potassium nitrate, sodium nitrate, lime, carbolic acid, and other germicides, acids, and alkalies. The majority of these additions have been made in a haphazard manner, as a rule doing more harm than good ; the use of carbolic acid is thought by some to improve the quality of the product.

It will now be well to consider what it is that causes the yield of indigo practically obtained to fall so far below the quantity which can be obtained from the plant in a laboratory experiment. The principal loss appears to be in the deposition of indigotin in the plant cells, and from the liquid in the steeping-vat a further small quantity is probably destroyed by putrid ferments. As already mentioned, a solution of indican deposits indigotin slowly at ordinary temperature —at the temperature of the steeping-vat (85°F. to 95°F.). The amounts thus deposited during the time of steeping (some twelve hours) must be considerable, and the writer has made a series of experiments to determine whether it is not possible to prevent this decomposition of indican taking place and avoid a serious loss. It was found that a solution of indican is practically permanent at a temperature below 400 F., provided the liquid is not unnecessarily exposed to the air. The experiment was several times repeated of steeping the plant in a small vat with water maintained at about this temperature by additions of ice. The effect of this cooling was very marked : the extraction was slow, requiring some sixteen to eighteen hours for its completion ; the liquid was clear, bright, and of a fine greenish-yellow colour ; a very slight amount of fermentation seemed to take place, and the evolution of gas was small. The yield was perceptibly improved, the average being about 20 per cent. increase, and the quality of the resulting indigo all that could be desired, the extracted plant being of a much lighter colour than usual. The writer found that the figure obtained by adding the amount of indigo as found in the residual extracted plant to the amount obtained by the extracting process was practically a constant for the same class of plant. When iced water was used the amount of indigo obtained increased, but a smaller quantity remained in the extracted plant than when water at ordinary temperatures was employed. These figures were necessarily only approximate, as the calculation of the mass of plant is difficult and leads to error. This process has not been tried on a large scale owing to the expense and difficulty of importing the necessary freezing machinery, and of the inconvenient length of time which would be required for the extraction of an ordinary vat of indigo ; this time, however, might undoubtedly be greatly shortened if the plant was crushed or bruised beforehand, provided this would not lower the yield. The quality of the water used for steeping affects the quality of the dye very materially, and the yield seems to be slightly influenced. The water most suitable for use is clear, free from finely suspended inorganic matter, and containing from five to ten parts per 100,000 of calcium carbonate. A water rendered turbid by finely divided inorganic matter held in suspension is not necessarily unsuitable for use, as the mud settles on the plant during the steeping process and remains there ; but there is a variety of very finely divided slimy clay, which, although it does not cause the water to appear very turbid, nevertheless yields a bad coloured and heavy in-

digo, as the clay will not settle on the plant in the steeping-vat, and a portion is apt to pass through in to the beating-vat, and being carried down and settling with the precipitating indigo passes on with it, its removal not being possible in the later stages of manufacture. The addition of a suitable amount of alum to the water causes the particles of this clay to become entangled with the other precipitated impurities, which can be removed very cheaply by settling or filtering, leaving a clear and very bright water perfectly suitable for manufacture. This process works well on a large scale.

Beating.

The beating process has for its object the conversion of the solution of indican, or indigo-white, into insoluble indigo-blue or impure indigotin. This oxidation may be performed by hand or mechanical means. When hand beating is used each steeping-vat is provided with a corresponding beating-vat of a similar capacity, and situated at a lower level.

As soon as the steeping is finished the opening in the vat is opened, and the liquid flows into the beating-vat, where it is agitated by a number of coolies, who, standing in the liquid, beat it with plungers formed of a disc of wood, the centre of which is attached at right angles to a short handle. The liquid as it enters the vat is of a clear, brownish-yellow colour, and the first effect of the beating is to raise a thick white foam. As the agitation proceeds the foam disappears, or if persistent may be removed; the liquid turns green, then bluish, and finally looks quite black, and no foam rising to the surface. After beating for one or two hours, more or less, the precipitation is finished, which is shown by the fact that on the removal of a small quantity of the liquid in a white plate, the precipitate is flocculent and inclined to settle; also, on filtering through a coarse cloth the filtrate is clear, with no tinge of blue.

For beating by machinery, instead of a series of independent square vats, one long tank is used, which receives the liquor from a number of steeping-vats. The long vat is divided into two by a partition wall running longitudinally up the middle, and extending to within a few feet of either end. On one side, between the middle and the outer wall, is placed a paddle-wheel similar to that on a small paddle-steamer, with the floats removed, the agitation caused by the passage of the iron arms through the liquid being sufficient for the purpose intended. This beating wheel is driven by a steam engine, and when working causes the liquid to flow down on one side, round the end of the partition wall, and up the other channel, the liquid thus circulating rapidly round the tank and passing continually under the revolving wheel.

Other systems of beating are also in use, but they do not seem to possess any special advantages. By one process the liquid is pumped continually to the top of an inclined plane, and flows down to be pumped up again; while a system has been tried in which the liquid is raised to a height and allowed to fall as a shower into the tank below; the injection of air has also been suggested. But whatever system of agitation is employed the results are much the same, although for some reason the indigo produced by hand beating seems to command a higher price than that in the manufacture of which machinery is employed. It appears that the yield obtained in the beating process is almost theoretical, practically the whole of the indigo originally present in the vat being removed. Any improvement in this connection would be purely of a mechanical kind, and designed to save labour or time.

Settling.

When the beating is finished the liquid is left at rest until the indigo has commenced to settle, and the supernatant water has become clear. This water is drawn off either by removal of a series of pegs placed in holes, which holes range from the bottom to the top of the vat, the uppermost peg naturally being the first removed; or another device is employed in which an outlet pipe is capable of being moved so that the opening is just under the surface of the water, the mouth of this pipe being depressed as the water level sinks. The supernatant liquid being thus drained off, under favourable circumstances, in a few hours time the indigo remains as a black slush or magna (mahl) at the bottom of the vat, while the water (seat water) is run to waste or is

used as a weak liquid manure for the lands adjoining the factory. This seat water, which when stale has a very unpleasant odour, is highly valued by the planter for its fertilising properties ; it contains, however, merely a trace of ammonia and some potash salts, and it appears doubtful whether in some cases it really repays the expenses which are incurred in pumping it on to the land.

Boiling.

All the indigo magna (mahl) obtained from one day's working is conveyed by channels or other means into a well (mahl jeeri), from whence it is pumped into the boilers, which usually have an inch or two of water placed in them beforehand. These boilers are simply square sheet-iron tanks which are either heated by direct fire or steam-heat. Direct fire is usually a wasteful method, as the furnaces are badly constructed, only a small portion of the bottom of the boiler being exposed to the action of the fire ; a volume of cold air is admitted, much larger than is necessary for the perfect combustion of the fuel ; and unless vigorous stirring is maintained there is a danger of the indigo sticking and burning on the hot boiler-plates. Steam-heating should be less expensive, as the steam is usually derived from a well constructed engine-boiler, the boiling is easily regulated, and there is no necessity for constant stirring, there being no danger of burning the indigo.

There are various views held by planters as to how long the indigo should be boiled, some merely raising it to the boiling point and then running it on to the filtering table, and a few boiling as long as half an hour. The writer believes that the object in view, which is the destruction of ferment and the granulation of the particles of indigo, would be accomplished best by allowing steam to blow into the liquid for ten minutes after the boiling point is reached. If by any carelessness the indigo has been burnt, the finished article will be characterised by a dark, dull colour, which is not saleable at a good price.

Filtering.

The boiling indigo is run directly to the filtering tables, which are constructed with a flooring and sides of slats of wood, the area being about 15 by eight feet, and the sides are sloped out some three feet high. This table, which is best described as a shallow box of slats of wood, is covered with a large sheet of a special kind of canvas, which is moistened and well pressed down so as to fit closely against the bottom and sides of the table. All being ready the boiling indigo is run on, and almost immediately the water commences to pass through clear. In a few hours' time the indigo remains behind as a thick paste, covering the canvas to a depth of an inch or two. The sheet is then drawn to one end of the table so as to collect the paste together in one place as if in a bag so as to cause more of the water to be expelled. Reboiling the indigo from the table with a large quantity of clear water, repeated one or more times, has been found by the writer to materially improve the quality of the colour obtained.

Pressing.

The thin paste of indigo from the filtering table is put into wooden press-boxes lined with stout canvas ; such a quantity is put in that the resulting slab of pressed indigo will be about three inches thick. Some ten or twelve inches depth of the indigo paste may be required to obtain this result. The press-boxes are placed in a kind of rough screw-press of which there are a number in the press-house. The screw of the press is moved by coolies armed with a long bar, in the middle of which is a square hole to fit the top of the screw, or the nut, as the case may be. The pressure requires to be very carefully applied at first, or the canvas may be burnt, or the indigo forced out through the openings. Towards the end the pressure must be very strong to injure a firm and sound cake. Only one gang of coolies go from press to press turning the screws of each in succession, the whole operation requiring about twelve hours. The press-boxes when opened, if all has gone on well, should contain a solid, firm slab of indigo, the usual size of which slab being such as to give when cut up about seventy cakes of indigo three inches square.

(*To be continued*).

Thirty two Shorthorn bulls have been bought in England by the Russian Government and sold at half price to the cattle breeders of the Don, Kouban and Terek steppes to improve their cattle.

Locusts Acts.

THE following are Acts of this Colony dealing with locust extermination :—

ACT No. 30, 1898.

"*To extend the provisions of Act No. 33, 1895, entituled an 'Act to provide for the Extermination of Locusts.'*"

BE IT ENACTED by the Queen's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Legislative Assembly of Natal, as follows :—

1. This Act and Act No. 33, 1895, shall be read and construed together as one Act.

2. The word "farm" in this Act shall mean and include any rural property other than lands belonging to or used by the Crown.

3. Where any farm is infested by locusts at that stage of their growth when they are as yet unable to fly, the owner or occupier of any adjoining farm may, by notice in writing, call upon the owner or occupier of the first-mentioned farm to destroy the said locusts, and the latter shall, if called upon to do so, assist, both by himself and by his servants, in effecting their destruction.

4. Where any person requested to destroy the locusts upon his farm shall neglect or refuse to do so, the person who requested him shall be at liberty to enter upon the farm, together with his servants, for the purpose of destroying the locusts, and while so engaged neither he nor his servants shall be deemed to be trespassers.

5. Any expense incurred in destroying locusts after notice given in the manner hereinbefore provided shall be borne in equal proportions by both parties, whether the locusts shall have been destroyed by both parties jointly, or by one or other of them, and the party by whom the expenses may have been paid shall have a right of action against the other party for his proportionate share of such expenses.

6. This Act shall extend to, and be of force in, any Magisterial Division which may be brought under the operation thereof, as provided in the next section, but nothing in this section shall be deemed to limit the operation of Act No. 33, 1895.

7. If at any time a memorial shall be presented to the Governor, signed by not less than twenty owners or occupiers of rural lands within any Magisterial Division praying that this Act may be extended to such Division, the Governor in Council shall cause such memorial to be published in two issues of the *Natal Government Gazette* and not less than two issues in each of two successive weeks in some Colonial newspaper circulated in the Division. At any time after the expiration of three weeks from the date of the first publication of the memorial the Governor in Council may, if it appear to him expedient to do so, declare by Proclamation that this Act shall extend to and be of force in such Magisterial Division.

Given at Government House, Natal, this Fifteenth day of August, 1898.

By command of His Excellency the Governor.

HENRY BALE,
Attorney-General.

ACT No. 33, 1895.

"*To Provide for the Extermination of Locusts.*"

WHEREAS it is expedient to make provision for the extermination of Locusts :

BE IT THEREFORE ENACTED by the Queen's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Legislative Assembly of Natal, as follows :—

1. This Act may be cited as the "Locust Extermination Act, 1895."

2. The Governor may, from time to time, by Proclamation, declare any portion of the Colony to be a locust area within the meaning of this Act.

3. The Governor may, from time to time, require the inhabitants of any locust area, whether Europeans, Natives, Indians, or others, being in occupation of land in such locust area, to concur in steps which may be deemed necessary by the Governor for exterminating Locusts.

4. The Governor in Council may, from time to time, make, repeal, alter, and add to rules and regulations, and may do all things necessary for the extermination of Locusts and for carrying out the provisions of this Act.

5. The Governor in Council may, from time to time, appoint some fit person or persons to carry into effect the purposes of this Act, and may delegate to him or them all or any of the powers and authorities hereby conferred on the Governor, and may, from time to time, remove any person so appointed and appoint another person in his stead.

6. The Government shall not be liable nor shall the Governor be personally liable for any loss or damage arising from or caused by anything done under the authority of this Act; and every officer or person acting under the authority of the Governor, and any other person acting in aid or under the orders of any such officer or person, may from time to time enter into and upon the land of any person or persons, firm, company, board, society, or corporation, and may cut grass and take brush wood thereon or therefrom, and do all other things necessary for the purpose of carrying out the objects of this Act, and shall not be answerable or chargeable for any act of trespass which they may respectively have committed on such lands for the purpose aforesaid.

7. Any officer of Government appointed under this Act, may set fire to and burn grass and brushwood within any locust area, on Crown Lands and Lands of the Natal Native Trust and Lands not occupied by Europeans, and also on private lands, having first obtained the consent thereto of the owner or lessee of such private lands or his agent.

8. If any person is sued or prosecuted for anything done by him in pursuance or execution, or intended execution, of this Act, or of any rules, orders, or regulations made thereunder, he may plead generally that the same was done in pursuance or execution, or intended execution, of this Act, or of rules, orders, or regulations made under authority of this Act, and may give the special matter in evidence.

9. Where any matter or thing is by this Act, or by any rule, regulation, order, or notice made and published under the authority hereof, directed or forbidden to be done, or where any authority is given by this Act to any person to direct any matter or thing to be done, or to forbid any matter or thing to be done, and such act so directed to be done remains undone, or such act so forbidden to be done is done, in every such case every person offending against such direction or prohibition shall in the absence of any other special provision of this or any other Act in force be deemed guilty of an offence against this Act.

10. Every person guilty of an offence against this Act or any regulation passed hereunder shall, for every such offence, be liable to a penalty not exceeding Twenty Pounds Sterling, and in default of payment thereof shall be imprisoned with or without hard labour for any period not exceeding Three Months.

11. All penalties or other moneys payable in respect of any offence against this Act, or any rules or regulations made thereunder, may be recovered before the Court of the Magistrate of the Division in which such offence shall have been committed or in which the offender may be found.

12. All fines under this Act, or any rules or regulations thereunder shall, when recovered, be paid into the Public Treasury.

Given at Pietermaritzburg, Natal, this Twenty-fourth day of August, 1895.

By command of His Excellency the Governor,

JOHN ROBINSON,
Colonial Secretary.

One of our readers informs us that, having seen a statement in some English medical journal to the effect that sulphur, taken internally, would protect a person against flea bites, it occurred to him to try it as a preventive of mosquito bites. Accordingly he began taking effervescing tablets of tartar-lithine and sulphur, four daily. He provided himself with several lively mosquitoes, and having put them in a wide-mouthed bottle, inverted the bottle and pressed its mouth upon his bare arm. The mosquitoes settled upon his skin, but showed no inclination to bite him. If this gentleman's experience should be borne out by further trials, it might be well for persons who are particularly sensitive to mosquito bites to take a course of sulphur during the mosquito season, especially in view of the growing opinion that the mosquito is the common vehicle of malaria.—"New York Medical Journal."

Gleanings.

The death occurred on the 29th ult. of Mr. Joseph Harcourt, at his residence, Hill Top, after a painful illness of about three weeks' duration. Some reference to the late Mr. Harcourt will be found in an interview with Mr. John Marwick, No. 25, Vol. III.

An agent of Professor Lonsbury, of Cape Colony, is collecting 20,000 ladyhirds in Massachusetts. One hundred children gather them in, and receive one penny each for them. The farmers, who never before appreciated their ladybirds, want the exportation stopped. They suggest a close season for the insects.—*Daily Express.*

According to the *Chasseur Illustrè*, a decoction of one part of stramonium leaves to three parts of water, boiled for 20 minutes and applied, when cool, to the face, about the ears, inside the legs, about the belly and coup, is sufficient to keep a horse free from its insect tormentors during a whole day. Stramonium is said to be much more efficacious when thus used than tobacco.—*Pharmaceutical Journal.*

The following entry in the *Calendar of Close Rolls* for 1312 shows how young horses were fed in Edward II.'s time. It is an order to the Sheriff of Oxford to provide maintenance for 24 colts, which the King was sending to be kept in the town and castle of Oxford :—To wit hay and straw, a bushel of oats, and two bushels of bran daily for every four of them ; and to pay 2d. each daily to eight grooms with the said colts.

Intellectual work is almost as essential to perfect bodily health as manual labour. This may seem an over-estimate of the fact, but it is not so. The ploughman who does not read and think is neither so active or so strong as his fellow who does both. Just as physical health is essential to the perfection of high and varied mental powers, so is mental activity a general condition of the highest degree of physical health.

The danger of watering horses after feeding was well shown in an experiment carried out some years ago on the Continent, where a number of worn out horses were purposely killed for dissection, with the object of determining the effects of giving water shortly after the animals had consumed full feeds of grain. As might have been expected, a large quantity of the undigested grain which the animals consumed a short time previously was found to have been carried a long way into the intestinal tract, fully 20ft. from the stomach, and though it had been there for only a short time, there were indications that it had already commenced to set up an inflammation of the mucous membrane, or the delicate covering of the intestines.

It is said that the Duke of Leeds, who died in 1838, bought "Octavian," winner of the St. Leger of 1810, when a foal, from one of his tenants, having seen the dam drawing a plough and the foal following her.

Reports from Argentine show that the natural pasturage has become "sheep sick" from long continuous feeding, and that on some of the ranches which formerly turned off the fattest sheep it has been found necessary to break the soil and lay the land down in alfalfa. The damage to the pasture by overstocking has been so great that the Government has taken means to induce the extensive cultivation of exotic grasses.

A very interesting African tree is termed the "whistling tree." In the "Pharmarceutical Journal" we are told that a gum is obtained from it. Dr. Schweinfurth says that as the wind blows across its branches it produces a sound analogous to a flute. This musical property, wonderful in a tree, especially a gummy one, is due to the fact that the base of the prickles of the hirsute branches is perforated by a certain insect, which sucks the gum out and transforms all the thorns into little flutes The gum from this tree is known as Sennaar gum, and is valuable.

A good idea of the value of road machines was contained in a report supplied to the Manawatu Roard Board, New Zealand. The machine was purchased by the Board on July 19th, 1900, and from that date to Octoher 3rd, 1900, the total length of roads trimmed and crowned up was 65 miles 27 chains. The average cost of this work was about 3½d. per chain, and under the old system the cost would have been 2s. 6d. per chain. A newly-formed road, 20ft. wide and 1 mile 62 chains in length, cost 3s. 2d. per chain, while the charge under the old style of working would have been about 15s. per chain. It is apparent that the purchase of the machine has been an excellent investment for the Board.

Mr. George Valder, principal of the Hawkeshury Agricultural College, has been offered the post of Director of Agriculture by the Victorian State Government. The offer is testimony to the worth of Mr. Valder, and shows the esteem that he is held in down south, for the post carries with it a salary of £800 per annum But New South Wales could not afford to lose his services at £800 a year, or more. Mr. Fuller went from the N.S.W. Department of Agriculture to South Africa ; Mr. Benson, to Queensland ; and, more recently, Mr. Gurney also to the northern State. All of these men were good, and their services should have been as valuable to New South Wales as to the other places. Parsimony and lack of encouragement to really capable men is not a policy that pays. —"Station, Farm, and Dairy."

Dairy Cows.

"KORADJI," in the "Queenslander," writes: — When principles of cleanliness and proper methods of handling products of the dairy have been inculcated in the farmers, they must also keep foremost in their operations the absolute necessity of establishing a dairy herd of the first order of merit. Scripture tells us that "no man by thought can add one cubit to his stature," but thousands of dairymen, by taking thought about the management of their dairy herds, feeding their cattle, and attention to their dairies, could add one-third to their productiveness; and all this would be clear profit — the result of thought expressed in effort.

It is frequently noticed that not a few farmers, when hearing of the profits derived from private dairying, or from a newly-established creamery, become animated over the prospects, and as a result every cow on the farm, and every cow that can be bought in the neighbourhood regardless of quality, is drafted to contribute its quota to the milk-pail. It may be here stated that where the average Queensland farmer shows a lack of those business-like qualities essential in every trade or calling is in not keeping a proper record of milking results of the individual members of his dairy herd. Therefore he is not in a position to tell how many of his cows are giving a return equal to the cost of feeding, or up to the known capacity of ordinary cows. Sometimes a partial record manifests itself at the end of a certain time, in working an inferior dairy herd—a herd probably got together without the slightest regard to breeding or standard quality. The profit is either a minus quantity, or so small as to force the conclusion that dairying does not pay. This dissatisfaction is frequently contagious, and a number of farmers in a single community have been known to stop milking their cows, because they have found by experience that there is no money in the business. A man might with just as much propriety buy up all the razorback hogs he could find, and after a year's experience declare that there is no money in raising pork, as to say there is no money in milking cows. There is no doubt there are many cows in Queensland practically "eating their heads off," to say nothing about the expense of labour or interest on the money invested.

In grading a dairy herd so as to weed out the unprofitable cows the usefulness of the Babcock test on the farm has been made apparent by experience. Mr. Thomson, the South Australian Government Dairy Expert, recommends this valuable apparatus to the farmer, who can, at a trivial cost, determine the capabilities of each cow, and by a little care and tact can grade his herd to a class of creditable milkers. Obscure ideas of the merits and demerits of foods would no longer exist in the minds of the doubtful. Experiments could be conducted to ascertain relative values of the feed given, and great would be profit were the Babcock and the balance put into universal use. The spring balance is suspended from the wall support of the milking shed, and the operator records the weight of the milk in a register. The four-bottle Babcock machine and flasks should be on hand, together with the acid, additional flasks and pipettes. The simplicity of the practice enables anyone to carry it out to complete satisfaction in grading milking stock, and readers will understand the good influence this introduction to modern dairying will exert in future.

The following may be taken as an example where weighing milk from each cow has been practised and systematic dairying conducted. A dairy farmer in South Australia possesses a very fine herd of milking stock. He began dairying with one cow, and in 1893 he owned four cows, which yielded an average of 450 gallons of milk each for the year. In 1896 his herd had increased to eighteen cows, and the record was 547½ gallons to each cow. In 1897 the average for twenty cows was 720 gallons, and in the year 1900 twenty-five cows averaged 800 gallons. The quantity of milk did not rise at the cost of quality, as the percentage of fat in the milk of the twenty-five cows had never fallen below 4 per cent.,

and in a number of cases had exceeded 5 per cent. Herewith is an explanatory register, showing actual results from cows in a South Australian dairy : —

MILK AND BUTTER FAT REGISTER.

		Weight of Milk.					Total for Week.		Percentage of Fat.					
		M.	Tu.	W.	Th.	F.	Sat.	Sun.	lb.		M.	Tu.	W.	Th.	F.	Sat.	Sun.
Olive	...	12	12	12	12	12	12		84	Morning ...	5.2	5.2	5.2	5.2	5.2	5.2	5.2
	...	12	12	12	12	12	12		84	Afternoon ...	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Brindle	...	10	11	11	11½	10½	11	10	75	Morning ...	3.2	3.8	3.6	3.8	3.8	3.8	3.8
	...	8	8	8	8½	7½	9	10	59	Afternoon ...	4.2	4.6	4.2	5.2	4.6	4.4	4.4
Daisy	...	9½	9½	9½	9½	9½	9½	10	67	Morning ...	4.0	4.1	4.4	4.5	4.6	4.8	4.8
	...	7	7	7	7	7	7	6	48	Afternoon ...	5.1	5.6	5.4	5.6	5.4	5.4	5.4

JUDGING DAIRY COWS.

There is, and always will be, a great diversity of opinion as to the merits of the various breeds of dairy stock. Some adhere to a breed with a pure lineage, while others regard certain crosses as being the ideal standard of dairy cow. It is, however, generally conceded among leading stockbreeders that there are certain well-defined points which may be regarded as typical of the high-class animal for milking purposes.

In judging dairy stock, 100 is assumed to represent the ideal or perfect dairy cow. The following is a list of general qualities and particular parts considered, with the figures indicating the "weight" or importance attached to each in making up the total of 100 points, which stands for perfection.

General Appearance.

Constitutional vigour, as shown by size, apparent health, strength, activity, and "general appearance," 5.

Form, wedge-shaped, as viewed from front, side, and top, 5.

Quality.—Hair, fine, soft; skin, medium thickness, loose, mellow, and unctuous, with yellow secretion, 5.

Temperament. — Active and nervous, but not wild; indicated by movements eyes and lean appearance, 5.

Head and Neck.

Forehead.—Broad and full, 2.

Horns.—Small and fine, not too long, set well apart, 1.

Eyes.—Large, prominent, bright, and yet placid, 1.

Face.—Lean, not too short, straight, or slightly dished, 1.

Muzzle.—Clean and strong, mouth and nostrils large, 1.

Ears.- Medium size, fine in texture, yellow secretion abundant, 1.

Neck. — Rather long and thin, fine, clear throat, and light dewlap, 1.

Forequarters.

Chest and Brisket.—Broad and strong low, but not too fleshy, 3.

Withers. — Well defined, firm, and lean, 1.

Shoulders. — Light, not fleshy, and oblique, 1.

Legs.- Straight, rather short, and not too large or coarse, 3.

Body.

Back.— Well defined, lean, open-jointed, not too level, and smooth ; a good spine, 3.

Barrel or Body.— Long and large ; ribs broad, well arched, open, and well defined ; a large, strong body, 8.

Heart Girth.—Large and deep, abundant room for active heart and lungs, 4.

Belly.—Large, broad, and deep, with a large and strong navel, 6.

Loin.—Broad and strong, 3.

Hindquarters.

Hips.—Wide apart, 2.

Pelvic Arch.—Prominent and strong, 3.

Rump.—Long and wide, 2.

Tail.—Long, fine, with a good switch, 1.

Thighs.—Long and lean, no beefiness, thin flanks, 3.

Legs. — Straight, rather short, wide apart, giving open twist, and not too large or coarse, 3.

Fore Udder.—Full, broad, and extending well forward, not fleshy, 8.

Hind Udder. — Full, broad, and attached, high, not fleshy, 8.

Teats. —Of good size and form, evenly placed, 5.

Milk Veins. —Upon the udder and in front of it, prominent, large, and tortuous, leading to large, open milk wells, 5.

Notes.—In scoring or marking give to each part the number of points which it appears to deserve on the scale given ; use fractions of one-fourth, if necessary. Thus, if the forehead is broad, full, and satisfactory, mark 2 ; if neck is short, thick, beefy, mark $\frac{1}{2}$ or $\frac{1}{4}$, or perhaps 0 ; if fore udder is deficient or defective, mark 6, 4, or 2, as the case may be. A good cow closely criticised and scored should have a total of 80 points or more.

Best Breed for Butter and Milk.

To the question which is the best breed for butter and milk, there are people who can give direct and unequivocal answers, but the trouble is they do not agree. One says Jersey, another the Holstein, a third the Guernsey, and others will name the Shorthorn, Red Poll, Ayrshire, and last, but not least, the cattle known as the South Coast breed. These men are, as a rule, of equal credibility, and presumably of equal intelligence and information ; but this information runs in different directions with the different individuals. The man who recommends one breed to the exclusion of others is usually more or less ignorant of the others, or is prejudiced against them.

If there is any best breed for both butter and milk, we do not know which it is. The impartial and most authentic records seem to show that the Holsteins produce milk more cheaply than the others, and that Jerseys and Guernseys produce butter at less cost for feed ; but it is within the observation of every man that the best cows in almost any breed are infinitely better than the poorest in other breeds.

The advice given by men in whom we usually have the most confidence is that a man should adopt such one of the dairy breeds as he most inclines to, for the reason that it is human nature to be most friendly and considerate to those animals that fill our eyes with greatest satisfaction ; and unless a man can put himself in complete rapport with his stock, it will not do its best. There is quite as much room for choice within any breed as there is between breeds, and hence it is not enough to adopt a particular breed. Be sure and get animals of a distinctive dairy form and temperament ; see that they have the incurving thigh, the high arching flank, the rising pelvic arch, the clear eye, and a general make-up that denotes high courage and endurance.

In almost any herd of cattle may be found two distinct types of cows—one a beef type ; and you may know her by her close, compact form, thick shoulders and neck, thick meaty thigh, close, well-sprung ribs, straight, smooth back, placid disposition. This is a beef cow no matter what her breeding may be. You might as well try to make a successful racehorse of a Norman as expect a good dairy cow made up as described. The butcher is looking for that type. Let him have it.

The other type is almost exactly the opposite in conformation from the one above described. You will find her with thin, sharp shoulders, thin neck, and dropping a little at the shoulders, with thin, flat thighs, well apart, to make room for her udder, with broad long hips, with strong back and pelvic arch, angular shoulders, and plenty of chest capacity for lungs and digestion. She should have a clear expression of the eye and muscles like a racehorse. As you pass your hand along her back it presents a rough surface. Above all the dairy cow should be deep through the flank, with a square udder, running well forward on her belly, and well up behind between the thighs, with teats of good length and squarely placed, with long tortuous or ramifying milk veins terminating forward with large apertures. In the flank just above the udder is what is known as the milk gland, which is easily found in a good cow. In the opinion of the best judges this gland is always well developed in a good cow.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	F. R. Moor ...	Greystone.
		„	R. C. O'Neil ...	Hillgrove.
		„	B. J. Wilkes ...	Portington.
		„	Du Plessis & Cloete	Compensation.
		„	J. Van der Merwe	Welgekoose.
		„	C. W. Dennill. ...	Guadaloupe.
J. Button ...	Estcourt, South of Bushman's River	„	S. Nel ...	Wagon Drift.
		„	C. B. Lloyd ...	Hidcote.
		„	L. Berthon ...	Littlecote.
		„	J. Chadwick ...	Howard.
		„	C. J. Smythe ...	Stratherne.
A. H. Ball ...	Weenen ...	„	W. Lotter ...	Doornkloof.
		„	P Van Rooyen ...	Middleburg.
		„	C. P. F. Van Rooyen	Mona.
		„	A. Hair	Oribee Vlakte
		Lungsickness	Maboko	Bushman's River Poort.
E. J. B. Hosking ...	Upper Umkomanzi	„	J. Baynes ...	Meyer's Hoek and Onrust.
W. Wilson	Polela	Scab	A. W. Leggatt ...	Selbourne.
		„	J. Hayes ...	Glengariffe.
		„	H. Pennefather ...	Home Rule.
		„	R. C. Gold ...	Woodend.
		„	R. M. Arbuckle ...	Costmore.
		„	J. J. Van Dyke ...	Riverport.
		„	J. Van der Merwe	Nooitgedacht.
		„	S. Maritz ...	Maritzdale.
		„	F. E. Peto ...	Clovelly.
		„	H. Nicholson ...	Fondling.
		„	H. C. Gold ...	Dartford & Greenend.
		„	C. A. Phipson ...	Macedonia.
		„	J. Van Wykes ...	Epsom.
		„	Caleni	Location.
		„	J. Willson... ...	Stony Glen.
		„	G. Houston ...	New Bigging.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	Kamana	Sand Pits, Town Hill
		„	H. H. Boden ...	The Knoll, Hilton Rd
		„	Mrs. Rea ...	90, Pietermaritz St. Pietermaritzburg.
		„	N'cundane ...	ZwaartkopLocation
J. A. Morrison ...	Durban & Umlazi	„	P. Saville ...	Umzimbazi.
		„	W. Pearce ...	Lower Illovo.
		„	Natal Government Australian Heifers	Vet. Compound, Durban.
L. Trenor ...	Alfred ...	Scab	J. Wessels ...	Sheepwalk.
		„	C. J. Triegaart ...	The May.
W. C. Robbins ...	Lower Tugela and Mapumulo	Lungsickness	Jackson & Dykes	Sunbury.
		„	F. Addison ...	Addington.
C. E. Hancock ...	Ixopo	Scab	C. L. Hammond...	Sunrise.
		„	Quinisani	Arundel.
		„	Mapundu	Springvale.
J. M. Wales ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	Lungsickness	F. E. Zunckel ...	Rivulet.
		„	Natives	Hongerspoort.
		„	Wm. Zunckel and Umliezana	Wilhelmus Hohé
E. Varty ...	Umvoti, Western Portion	Scab	J. M Van Rooyen	Pompoennek.

Stock Inspector.	District.	Disease.	Owner.	Farm.
A. S. Parkinson ...	New Hanover ...	Scab	Umshola & Makenke	Swaimana's Location
		"	R. Smith	Effingham.
		Lungsickness	C. Niebuhr ...	Borrelfontein.

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

Rinderpest exists on farms Kirkintulloch, Hill Crest, Riet Kuil, Zwaartkloof, Doornkraal, and Reproach in Ladysmith Division; in the Normandien District and Ingogo and Charlestown Town Lands and Newcastle, in the Newcastle Division; on the farms Jammerdaal and Frogmore, in the Kranskop Division; and at native kraals in the Nkandhla District, Zululand; also on farms Goedekloof and Babesay, in the Dundee Division.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 29th January, 1902.

Sugar Machinery.

THE "LILLIE" EVAPORATOR.

IN response to an enquiry from the Minister of Agriculture, regarding "Lillie" evaporators, Dr. D. Morris, D.Sc., C.M.G., Imperial Commissioner of Agriculture for the West Indies, has had the kindness to procure the following answer :—

Copy.]

Mr. Claude T. Berthon, to Imperial Commissioner of Agriculture for the West Indies.

Ceylon House,
49–51, Eastcheap,
London,
24th August, 1901.

Dr. D. Morris, D.Sc., C.M.G.,
Imperial Commissioner of Agriculture
for the West Indies.

Dear Sir,—In reply to your enquiry for information concerning the "Lillie" Evaporator, I would say that two of these machines are at work on estates with which I am connected in a consulting capacity; the one at Plantation Lusignan, Demerara; and the other at Canovanas Central Factory, Puerto Rico.

As your friends probably understand the construction of the "Lillie" I will not enlarge on it, but would point out that being a film evaporator the efficiency of the heating surface is very high, a square foot evaporating as much as 12 or 13 pounds of water per hour, as against 6 for a Standard Triple Effet.

The circulating pumps may be considered by some to be a disadvantage, entailing risk of derangement, but they ensure that the heating surface shall always be working at its maximum efficiency, whereas in a Standard Triple, unless liquor levels are very carefully regulated, efficiency falls off rapidly with irregular feeding.

Another very great advantage of the "Lillie" is that there is only 1-10th of the volume of liquor in process that there would be in a "Standard," and consequently the evaporator can be started and "boiled off" in a much shorter time than an ordinary evaporator, thus conducing to economy of fuel and labour.

A further advantage is that in case enlargement of the factory is contemplated

at the time the evaporator is laid down, it is constructed in such a way that the heating surface may be increased to any extent by raising the upper halves of the vessels and introducing additional elements : thus the increase of evaporative power is a matter of comparatively slight expense.

It has been stated that the little evaporator is self-cleaning. This is not strictly the case, but the cleaning required is very inexpensively and easily carried out.

In conclusion, I would say that I should have no hesitation in recommending the adoption of this evaporator in any factory where it would receive intelligent care and attention.

I would be happy to give your friends any further information they may desire, or to superintend the construction of an evaporator on their behalf.

I am, dear sir,
Yours faithfully,
CLAUDE T. BERTHON.

Ticks and Hides.

WHEN the importation of immune cattle from Queensland was first seriously contemplated, an idea got about to the effect that the Queensland cattle-tick greatly depreciated the value of the hides of beasts attacked by it. In consequence of this, some question of the danger of introducing the tick was raised.

The Government Entomologist, however, reported that as the differences between the Queensland species and the local redwater tick were practically so small, there was little likelihood of any grave calamity following the possible introduction of the former, although he considered it inadvisable to purposely introduce that species.

With a view of having an example of tanned hide from a once tick-infested beast, Mr. Fuller wrote to Queensland, and recently received a sample from Mr. P. J. Gordon, the Chief Inspector of Stock, Brisbane, who writes concerning it as follows :—

"By this mail I have posted to your address a sample of tanned hide showing the effects of ticks. It was with some difficulty that I obtained this.

"As you are aware, in the early days of the tick visitation, the effects of gross tick-infestment on hides was such as to reduce their value for purposes of shoemakers' and saddlers' leather something like 50 per cent. Now, however, by the use of dips in the worst tick-infested districts, and the fact that the ticks are not numerous on the immune cattle in districts where the ticks first appeared, the injury to hides is nothing compared with what it was.

"The selection of the cattle for Natal was left to me, and I made arrangements with a well-known owner in Rockhampton district to select 100 heifers and three pure bred Ayrshire bull calves in that district.

"The heifers are only of ordinary quality, as the selection was restricted to a tick-fevered district, where the dairy cattle are, in quality, far below those that can be procured in Southern Queensland, in non-infested districts.

"Mr. Fogarty has, by the same vessel, taken to Natal some 520 cattle, also from tick-infested district, and he has also taken a bull and two heifers from clean country (Darling Downs), but inoculated by one of our officers here, when they went through the usual course of the fever. If these are found immune in Natal, we will be in a position to send your Government, if desired, a very much superior class of cattle to those sent forward by the 'Kadina.'

"I send you copy of Professor Ligniere's report on Tristeza (Texas fever or Redwater), translated for our "Agricultural Journal"; also, translation of experiments to test his vaccine."

Veterinary Tariff.

WITH reference to Government Notice No. 506, 1899, it is hereby notified, for general information, that the following fees will be charged by the several District Veterinary Surgeons as from the 1st February, 1902 :—

	£	s.	d.
1. For every professional visit involving attendance for a period not exceeding two hours (except in the case of a dog)...	0	10	6
2. For a professional visit to a dog	0	5	0
3. Additional charge for surgical operation of a serious nature ...	0	10	6
4. For every hour of attendance or part of an hour, in excess of two, a detention fee of ...	0	0	6

In the Boroughs of Pietermaritzburg and Durban, within a radius of two miles from the Town Hall, and in any Township or Village in which a District Veterinary Surgeon resides, a fee of 5s. will be charged for each visit. In cases where the District Veterinary Surgeon does not reside in a Township or Village, the same fee will apply within a radius of two miles from his place of abode. In the case of an owner bringing his animal, for attendance or advice, to the District Veterinary Surgeon's office or abode, a fee of 5s. only will be charged. In every case a charge, according to their value, will be made for drugs used.

H. D. WINTER,
Minister of Agriculture.

Office of the Minister of Agriculture,
Pietermaritzburg,
16th January, 1902.

A Team of Alligators.

JEFFERSON LEE, says an American paper, who lives on the St. John's River in Putnam Country, Fla., has the most extraordinary team in the country. It is a team of alligators that Mr. Lee uses to tow his boat up and down the river when he goes to market. Mr. Lee has to go six miles down the river to his post-office, and it is a hard pull against the current coming back. He noticed how swiftly alligators swam, and it occurred to him that it might be a good thing to turn the alligators that abound in the St. John's River to some account. He captured a pair of young 'gators and raised them in his yard. He taught them to swim, and drag a weight behind them, and he also taught them to turn either to the right or left by pulling ropes fastened to their teeth on either side. When the alligators were big enough he put a harness that he had constructed on them and harnessed them to his boat. They swam well and pulled the boat through the water at a good speed. By pulling on the reins that passed through the mouths of the 'gators Mr. Lee was able to turn his strange water team in any direction he pleased. Mr. Lee made a point of never feeding his alligators until after they returned from a trip, when he would immediately reward each one with a fine meal. The alligators seem to be willing to perform their task of pulling his boat, and when he turns them out of the pen in which they are stabled, and starts them for the water, they shuffle down to the boat in the liveliest style, and after they are hitched they plunge into the water with grunts of delight. Mr. Lee says his strange team has never run away or kicked out the dash board of his river craft, but that they have one fault, for which, however, he does not blame them. They sometimes sweep their powerful tails in a curve through the water, and once smashed one of his boats into small bits, and threw Mr. Lee and a party that he was taking boat riding, into the river. They would have all been drowned had not the alligators swam back to them, and permitted the party to climb on their backs, after which the alligators swam swiftly to the shore, and all the party were saved. Mr. Lee now hitches up his team twenty feet in front of the boat, so that the sweep of their tails will not endanger the craft. Mr. Lee's success has created great interest among all of his neighbours, and now many alligators are being trained for duty as sea horses.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—The market remains almost absolutely the same as a fortnight back. This may in a great measure be traced to the fact that the railway, during the greater portion of that period, has, practically speaking, been closed. Maritzburg merchants have laid their grievances before the Commission appointed by the Government to enquire into the delay of the delivery of goods from the Point.

Mealies.—Grain is still falling in price, and now that wevils are manifesting their existence, it is depreciating in value. The average price is about 10s. 6d. to 11s. per muid.

Forage.—Some very fair samples are disposed of daily at prices varying between 2s. and 7s. 6d., and 8s. 2d. per 100 lbs. Of course price depends in a large measure on quality.

Hay.—Hay still commands good prices, some samples realising as much and even more than forage. While some samples have been as low as 3s., others have realised 4s. 2d., and as much as 5s. per 100 lbs. Bedding, according to size of load.

Potatoes.—It is many years since Maritzburg's market was glutted to the extent it has been of late with tubers. Some samples have been as low as 3s. and 4s. per 100 lbs., and one hears farmers complaining of the loss in planting potatoes.

Mabele.—Good samples maintain high figures. Although mabele of inferior quality has been sold at 4s. per 100 lbs., good stuff has realised 8s. 3d. per 100 lbs.

Onions.—From 2s. to 15s. 3d. per 100 lbs. It has now been demonstrated beyond all doubt that the soil in and around Maritzburg is peculiarly adapted for the cultivation of onions. It has been a serious question with householders to be able to supply their tables with this wholesome and nutritous vegetable; but when as much as 9d., 1s., and more per lb. has been demanded on our market for onions, one has been compelled to forego the pleasure of this luxury. At the last exhibition of the Pietermaritzburg Horticultural Society, some exhibits were staged which far eclipsed many of the imported article; and more than one cultivator expressed himself by saying: "I never dreamt that onions were so easy to cultivate." There is no necessity for importing so largely if people only tried to utilize some of the waste patches of ground in and near our city.

Poultry.—Common fowls from 1s. 1d. to 3s. 6d. 4s. 6d. each; ducks, 5s. to 11s. 6d. per pair.

Butter.—From 7d. to 2s. per lb.

Eggs.—From 1s. 6d. to 3s. 3d. per doz.

Sundries.—Mutton, 4½d. to 8½d. per lb.; pork, 4d. to 8d. per lb.; pigeons, 1s. 9d. to 2s. 6d. per pair; rabbits, 7d. to 2s. each; and bacon, 4d. to 7d. per lb.

Vegetables.—The market is now abundantly supplied with beans, beetroot, cabbages, carrots, cucumbers, lettuce, onions, peas, potatoes, marrows, rhubarb, tomatoes, and turnips.

Fruit.—Apricots, apples, bananas, grenadillas, lemons, oranges, mangoes, pineapples, plums, peaches, and strawberries. In fact, there is something to tempt the taste of the most fastidious offered every morning in the way of fruit.

Firewood.—From 7½d. to 1s. 2½d., per 100 lbs.

DURBAN.—We regret to say that our Durban report has not reached us at the time for going to press.

Experiments at several experimental stations in America have shown that too deep cultivation is injurious to maize. The first cultivation should be rather deep, but during subsequent workings the ground should be stirred as little as possible. Simply pulverise the crust and kill the weeds. The roots of the corn extend laterally but a few inches beneath the surface, and when the cultivator shovels, expose, or tear through them, injury is done the plant. The object of cultivation should always be kept in view, to establish and maintain a dust or soil mulch, and to kill the weeds that would rob the corn plants of food and moisture.

A curious race was that for the St. Leger in 1819. When the flag fell a number of horses failed to start, and the stewards ordered the race to be run over again. Mr. Ferguson's "Antonio" won the first race (it was, by the way, on this occasion that Mr. Ferguson lost £10 to a York Quaker, who bet him that he could not whistle while the horses were passing the post), beating "Wrangler" by half a length. In the second race "Antonia" did not start, but "Wrangler" did, and again came in second. An appeal was lodged by Mr. Ferguson, and the stewards of the Jockey Club, after consulting with the starter and judge, decided that the first race was the true one, thus overruling the Doncaster stewards.

Various are the materials which have been used for horse shoes. Gold occasionally, and silver frequently, were used by the most extravagant of the Roman nobles when Roman prosperity and extravagance was at its highest. Silver shoes are sometimes mentioned in records of much more recent date. Wooden shoes on the mud patten principle have been employed with success in the Western islands of Scotland, and also on deep grounds in America. Some years ago Mr. Henry Lucking, of Granfield, Wisconsin, drove his teams with large flat wooden shoes strapped over their feet when working them on soft wet meadow land.

The Agricultural Journal

AND MINING RECORD.

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CONTENTS.

Rinderpest.

BY H. WATKINS-PITCHFORD, F.R.C.V.S., Government Bacterologist and Director Veterinary Department.

(*Continued.*)

THE principle of injecting a small quantity of blood into the system of an animal immuned with bile was adopted, doubtless, with the hope of being able thereby to produce a longer period of insusceptibility in the animal so treated. In other words, it was hoped that an injection of virulent blood would, if withstood, convert the passive and temporary immunity given by the bile into an active immunity such as that conferred by an actual attack of the disease.

We all know that the immunity given by a single dose of bile is of short and uncertain duration. Koch, in his original publications, stated that the immunity following a dose of 10 c.c. of rinderpest bile "sets in on the 10th day at latest, and is of such extent that even four weeks afterwards 40 c.c.m. of rinderpest blood can be injected without any injurious result," and from this fact he concludes "that the immunity produced in such a manner is of an 'active' nature." From the experience of the past four years, we now know that the duration of the immunity given by a single dose of bile is on an average from

12 to 15 weeks, although this period seems to vary greatly in different cases, and in a case recently reported from India, one observer claims an immunity of a year's duration in one of the animals under his observation. Such proof of immunity is difficult in cases where the decision of such a point necessitates periodical actual exposure to the disease, which exposure, if successfully resisted, will at the same time possibly strengthen and prolong such immunity.

Observers, however, seem divided in their opinion as to whether the immunity produced by bile can be extended by the introduction of virus into the system during the existence of such immunity. That such should be the case without a marked reaction seems improbable, for it is—as far as we know at present—only by such reaction that an immunity of a high order can be produced. In most instances the immunity attained seems in direct proportion to the intensity of the general reaction. Although we see instances in which a high degree of immunity is conferred without marked general reaction, as in the case of the inoculation against quarter-evil, or vaccination against small-pox. The apparent local reaction following upon subcutaneous injection of gall does not seem to be due in any measure to the specific action of rinderpest-bile, as a similar swelling, &c., follows the injection of normal bile. This seems confirmed from the fact that excellent results from bile, both from an immunising and curative point of view, have been obtained by injecting directly into the jugular vein, and in such cases no more reaction has been observable than that which follows the introduction of serum in a similar manner. Dr. Koch was of the opinion that if animals resisted the inoculation with virulent blood during the period of bile immunity, that their immunity was without doubt increased. Such an opinion, however, does not seem to have found favour with subsequent workers; in fact, the view has been advanced by one worker of cons derable experience that the immunity, instead of being strengthened, is modified by the blood inoculation. While it is difficult to see how this could be the case, it is equally improbable that the introduction of the specific virus should give rise to the formation of any protective principle in the system of an animal without appreciable reaction.

One of the systems of bile inoculation which has been widely adopted in South Africa in the past provides for the introduction of 1-5th of a centremetre (3 or 4 drops) of rinderpest blood upon the 10th day after the first inoculation, which consists of 15 c.c. of glycerinated bile. It is claimed that by this method a loss of only 8 per cent. has been experienced in the treatment of many hundreds of thousands of animals. This would seem a practical and satisfactory system of immunisation, if evidence were forthcoming, that the resulting immunity was general throughout the herds so inoculated.

The question which at once arises in our minds is to what extent the bile injection, ten days previously, had rendered insusceptible the herd in question; for, from our knowledge of the immunising properties of bile, it seems probable that a large percentage would be able, on the 10th day after injection, to resist without difficulty the introduction into the system of a small quantity of virulent material.

The principle of inducing a mild form of the disease during a condition of partial susceptibility, and before a firm immunity had become established from the use of bile, would seem a good one if all the animals of a herd were equally susceptible, and could be looked to to give uniform reaction after a certain lapse of time. Such, however, we know unfortunately not to be the case.

While we are thus unable to gauge with any exactitude the degree of immunity established upon a given day after inoculation in an individual beast, we are still less able to forecast the exact duration of the immunity, and the time at which the beast will again commence to lapse into a condition of susceptibility. This prevents the adoption of any artificial measures to ensure a modified attack about this period. The suggestion to establish and maintain the sickness amongst a herd in which the immunity is expected to lapse would seem a practical one, were it not that such a measure could rarely be adopted without considereble loss. If in the animals of a herd, the immunity of which was known to be lapsing, a close contact with the disease could be ensured

by herding or kraaling the beasts together, advantage might thus be taken of this short period of partial and decreasing immunity, and a modified attack of the disease ensured. Such an opportunity, however, must rarely be available.

Failing this, then, it seems that if we would adopt the bile system of immunisation, we must trust to the maintenance of a condition of insusceptibility by successive injections of bile, and must forego the advantages of an immunity of an active or permanent nature, which can be established only by submitting the animal to the ordeal of a modified attack of this deadly disease.

Dr. Turner's Views on Rinderpest Bile.

WITH reference to Dr. Turner's letter in the "Witness" a short time since, stating that he had been mis-quoted in a previous article of mine on the subject of the infectious nature of some rinderpest biles, I should like to say that my statement was taken from an official copy of the Pretoria Rinderpest Conference in 1897. On page 35 Dr. Turner is reported to have said that "the question whether the gall can cause disease is still an open one."

Knowing, however, Dr. Turner's views on this important matter I suggested that he was reported incorrectly, remembering that all evidence given at this Conference passed through the hands of interpreters. I regret if I have unintentionally misrepresented Dr. Turner's views, and would beg to call his attention to the statement standing against his name in the official proceedings of the above Conference as the authority for my quotation.—H.W-P.

Rambouillet Rams.

MR. H. E. COOK, the representative of an American firm of thorough-bred live stock breeders, is engaged in disposing of Rambouillet rams and ewes. Several have been sold to Weenen and Umvoti farmers. The sheep will be on view at Estcourt for a few days.

Importation of Dogs into Great Britain.

AMENDED regulations respecting the importations of dogs into Great Britain are published in the *Government Gazette* of the 4th instant.

Mooi River Creamery.

THE annual meeting of the above Creamery was held on the 8th inst. The profits shown were some 20 per cent. A dividend of 7 per cent. was paid to the shareholders, and the balance was passed to the capital account. Elsewhere will be found an account of the proceedings. Correspondence

Natives Identification Act.

IT is notified by Proclamation that the Identification Act shall come into force on the 1st June next. The Act was published in the *Journal*—No. 22, Vol. IV.

Next Issue.

IN the next issue will appear an extremely interesting article on Pig Farming, by Mr. J. Bonnar, of Mount Partridge; also will appear one of Mr. Charles Barter's delightful sketches, entitled "Sambo." Sambo is the name of an intelligent dog Mr. Barter possessed while at Oxford.

Agricultural Shows.

Greytown, Thursday 29th May; J. M. Handley, hon. secretary.

Estcourt, Wednesday, 4th June; Herbert Blaker, J.P., hon. secretary.

Maritzburg, Thursday, Friday, and Saturday, June 26th, 27th, and 28th; A. Whittle Herbert, hon. secretary.

Richmond, Thursday 24th July; John Marwick, hon. secretary.

Noodsberg Road, Thursday, August 14th; F. Reiche, hon. secretary.

Geology.

THE first report of the Geological Survey of Natal and Zululand, by Mr. Wm. Anderson, the Government Geologist, has been issued, and may be procured from Messrs. P. Davis & Sons. This laborious work now commenced will prove of immense value. The contents comprise maps, sections, and 20 plates of rock scenery, an historical sketch and bibliography (over 100 works), and deals with the reconnaissance survey of Zululand, fossil plants from St. Lucia Coalfield, geology of the Lower Tugela district, necessity for a Natal Museum, scheme for the geological survey, and list of publications received. The information which Mr. Anderson is now engaged in collecting and presenting in systematic form to the Colony is not only necessary from an administrative point of view, but will also, and probably from the outset, prove of substantial value.

District Reports.

BULWER, 7th February.—There is little to report from this district for the last fortnight. The rainfall has been considerable, but at short intervals. Three fine days were experienced at the beginning of the last fortnight. This has helped the crops a good deal, as hot, sunny days were badly wanted. This does not apply to the whole of the Division, the heavy rains only being confined to limited belts of country in different parts of the Division. In some parts there has been almost a drought. For instance, in the Umkomanzi Valley the grass is dried up and parched for want of moisture. I hear that the crops generally throughout the Division look well. All kinds of stock is well and free from disease as far as I know, except one case of supposed glanders in a horse in the Underberg district. I have not heard the result of the inspection by the Stock Inspector of the Division. I am sorry to say Mr. Verney, the energetic Veterinary Surgon of the District, has been sent elsewhere, and we are now without a vet. The roads about the locality of Bulwer are in an almost impassable state, and the Superintendent of the Public Works Department has considerable difficulty with the limited labour supply provided him to keep traffic going. There was a large number of cattle offered for sale at Bulwer on the 29th January, 1902, and, with the exception of a small lot of cattle belonging to Dr. Hardwicke, who has been transferred to the Howick District Surgeoncy, the prices offered were low, and few sales took place.

H. W. Boast, Magistrate.

EMPANDHLENI, Nkandhla District, 31st January.—Mist and rain prevailed almost daily throughout the month, the total rainfall being 4.25 inches. The maximum temperature was 94deg., and the min. 51deg. The rinderpest in the district is being kept well in hand, only one fresh outbreak took place outside the infected area, and these cattle have been moved into the area. The Stock Inspector informs me that 59 head of cattle have died from rinderpest and inoculation at the three outbreaks of 160 head of cattle. In the infected area 578 head of cattle have already been inoculated with bile, and 26 head with serum. These latter were brought into the area from the Transvaal bad with the disease. The Stock Inspector is still busy inoculating as well as attending to outbreaks of lungsickness, of which I regret to say there are three fresh cases reported during the month, making seven herds in all under license. All that is possible to keep the disease in check is being done, but, at the same time, I fear diseases will spread all over the district in consequence of the removal of all stock from the border. Since the reward for killing wild dogs was made known the pack that came into the district has been hunted and left the district again. A very severe form of dysentery is prevalent in different parts of the district, otherwise the health on the whole has been good The crops on the high veld and along the border of the Transvaal are very backward, and cannot be said to be looking well. I am pleased to say, however, that all crops in the low country are looking exceedingly well. No locusts have been reported. The Boers are still very lively along the border, and some 60 horses and 116 sheep were reported to have been raided from the natives during the month.

C. C. Foxon, Magistrate.

LOWER MFOLOZI, 6th February.—Rather warm weather was experienced during the past month; still nothing to compare with the heat of last year. Rain fell on nine days: perfect deluges taking place on the 25th and 26th, and 29th to 30th. Not only were the Mhlatuzi and Mfolozi rivers flooded, but the insignificant Nseleni stream became a roaring, impassable torrent. Much inconvenience was caused by boat on upper drift of Lower Mfolozi being found unserviceable through leakage, necessitating a trip of 15 miles to the lower (Nkwelena) drift. On the 13th lungsickness was reported by native Joshua—induna of the Mpangeni Mission Station—among his cattle, and the death of an inoculated beast in the Rev. Twedt's quarantined herd. Steps were immediately taken by Joshua and other neighbouring Amakolwa to inoculate from an affected beast (killed), and quarantine took place; with the result that, so far, no cattle have been lost. Natives are very much concerned lest rinderpest should again manifest itself in this district, and some have even asked why Government does not inoculate all stock throughout the district against it—in advance or anticipation of its advent. Wild dogs were reported to have killed 9 sheep and 14 goats and injured 3 head of cattle—one dangerously—but not a single claimant for the £1 reward per head of the pest has put in an appearance. The dogs, it is said, actually drive buck into railway cuttings during the very early morning with a view to trapping them! Crops and stock look well throughout the district, particularly the latter near the Ukwelana. Early green mealies were and are to be procured almost everywhere. Swarms of "hoppers" were numerous, though it is understood great numbers were destroyed by grass fires in many places.

A. R. R. TURNBULL, Magistrate.

NEWCASTLE, 31st January.—The summer season, which had shaped so favourably up to the close of the old year, was, in this district, marred by protracted heat and drought up to the middle of the month, causing the bulk of the early planted mealies to dry off without bearing. The temperature was at times up to 98 in the shade. During the latter portion of the month rain has fallen which will save the later planted grain. Rinderpest has made some advance in parts of the district, and bile is in demand, the Charlestown Station having, I am told, experienced a great run. The mortality amongst cattle at Volksrust has, I believe, been heavy.

J. O. JACKSON, Magistrate.

NQUTU, 4th February.—The past month opened with a dry spell of nearly two weeks, and the country was beginning to look parched; but, fortunately, the remainder of the month saw some capital rains, in all 5.53 inches, and the crops are now looking well. One result of the short drought was that most of the young pumpkins were killed off. Amongst the mealie crops about the district the mealie grub (isihlava) is very noticeable, and I have remarked that it is more in evidence this season than in past seasons. No cases of deaths from horsesickness have yet come to my notice, although we are well into the period of its prevalency. Stock of all kinds are in first-rate condition. Lungsickness is still fairly prevalent, but owing to the disturbed state of the district, and the manner in which stock have to be herded as far inland as possible, it seems hopeless to be able to effectually deal with the outbreaks. Rinderpest, though prevalent on the border of this district, is still confined to the infected area within Nkandhla district. Large numbers of cattle and horses have been looted from natives of this district by Boers during the month.

C. HIGNETT, Magistrate.

Locust Report Lower Tugela.

MR. Stock Inspector Brown reported on the 30th ultimo:—No flying locusts have passed Lower Tugela during the month. There are a few young hoppers about the district, but are not sufficiently numerous to do any damage to the coming crops.

I have not heard anybody in the district complaining of them doing any harm.

Agricultural Bills.

DURING the ensuing session of Parliament it is intended to introduce Bills "To extend the operation of the Grass Burning Act, 1895, and to provide for enquiries into fires occurring along lines of railway in the Colony." "To empower the Natal Native Trust to take or to grant the use of water from rivers flowing through Trust Lands." The Bills are published in the *Government Gazette* of the 4th instant.

Director of Agriculture.

MR. A. N. PEARSON, who has been appointed Director of Agriculture, has arrived in the Colony, and has assumed duty. Mr. Pearson was the Agricultural Chemist to the Government of the Colony of Victoria.

Weekly Rinderpest Report.

11TH FEBRUARY, 1902.

Ladysmith Division.

WACHT-EN-BEETJE Kop, Van Reenen's.—Fresh outbreak among native stock; one dead; cattle inoculated.

Kirkintulloch.—The old outbreaks on this farm have died out. One death occurred amongst Liana's cattle.

Farms Brinley, Hill Crest, Macpherson's, Kleinfontein.—The disease has died out here.

Buy's Farm.—One death; no fresh cases.

Kleinfontein (adjoining Buy's Farm).—No deaths; no fresh cases.

Doornkraal and Swaartkloof. — No deaths; no fresh cases.

Van Reenen's, Brakwal, and Reproach.—The disease has died out here.

Upper Tugela Division.

Eartheote.—One dead and two sick amongst 22 oxen brought from Newcastle. The two sick oxen left behind at Newcastle are stated by D.V.S. Hutchinson to be suffering from the effects of inoculation for lungsickness. The oxen have been inoculated with bile and isolated. 127 head of mixed cattle on the farm have also been inoculated.

Newcastle Division.

Normandein Area.—Seven deaths during last week, of which five have been calves; six animals have salted.

Ingogo.—Two fresh outbreaks. Cattle of H. Lea and C. McLeod.

Lennoxton Area. — Two fresh outbreaks. Cattle of J. Smith and Mshamanya. Two deaths; one sick.

Hope Farm.—Several sick animals. E. Walker and the P. W. Dept., Lennoxton, have had heavy losses.

Charlestown.—The disease is dying out here. Most owners have inoculated.

Dundee Division.

Vellivreda, Goedgeloof, and Babesay.—No deaths; no fresh cases.

Aviemore.—Fresh outbreak here; 45 head of cattle of J. B. Craighead; one animal sick. Cattle inoculated with bile.

Lincoln and Swiss Valley.—Fresh outbreak; 450 cattle of Mr. Glutz. Cattle inoculated on the 24th January. Outbreak due to inoculation with raw bile. One animal sick.

Krantzkop Division.

Jammerdaal. — No deaths; no fresh cases.

Frogmore.—Two deaths; no fresh cases.

Elandsvlei.—No deaths; no fresh cases.

Elandskop.—Fresh outbreak; cattle of Mrs. De Waal. One death on the 7th.

The following farms, with the above, have been quarantined:—Entombeni, Sutherland, Buffel's Hoek, Drifontein, Scottsdale, Woodlands, Paul's Rest, and Middlehoek.

Zululand.

Nkandhla.—Four deaths; one fresh outbreak reported.

S. B. WOOLLATT,
Principal Veterinary Surgeon.

Grey Box Gum.

SOME time ago Mr. J. Mason, of Messrs. Merryweather & Sons, expressed in the *Journal* high appreciation of a certain gum timber. Later Mr. Mason was good enough to send specimens of the flower, seed, etc., which were forwarded by the Department to the Secretary for Agriculture, Sydney, New South Wales. The specimens were submitted to Mr. J. H. Maidan, the Government Botanist, who identified the tree as "Box Gum," or "Grey Box" (*Eucalyptus hemiphloia*). For further particulars of this timber see No. 19, Vol. IV.

One result of the bounty on sugar is that in France sugar costs 6d. a lb., and therefore people use as little of it as they can help. In Britain the price is 1½d. per lb. At present France consumes about 25 lb. a head, Germany 30, Austria 8, and the United Kingdom 82.

The Madras Government has sanctioned expenditure of R15,000 next year on experimental cultivation, of which R5,000 will be spent on starting a "sugar-cane station" in Godavery.

Meteorological Returns.

Meteorological Observations taken for Month of January, 1902.

STATIONS	TEMPERATURE (IN FAHR. DEGREES).				RAINFALL (IN INCHES).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1901.	Total for same period from July, 1st. 1900.
	Maximum.	Minimum.					Fall.	Day.		
Estcourt	...	...	93	52	5·70	15	1·15	25th	20·83	20·28
Nottingham Road ...	...	...	...	...	6·17	19	·95	25th	27·85	21·39
Adamshurst	...	...	96	54	6·46	21	2·25	13th	22·41	15·21
Hilton	...	...	95	50	5·70	23	·83	25th	24·41	18·57
Sunday's R., Indanyana	...	...	...	...	6·00	10	3·46	25th	...	...
Ixopo (Gorton) ...	...	...	86	60	2·38	21	·56	3rd	14.17	8·91
Mid Illovo	...	...	89	51	4·86	17	·96	30th	32·19	...
Ottawa	...	...	...	...	5·46	15	1.59	31st	21·05	22·6
Mount Edgecombe ...	...	...	95	65	7·53	17	2·96	31st	33·65	24·57
Cornubia	...	...	...	...	6·92	...	...	...	33·95	28·25
Milkwood Kraal ...	...	...	...	...	4·44	...	...	...	25·43	17·13
Blackburn	...	...	...	...	5·65	...	...	...	28·61	23·39
Saccharine	...	...	...	...	6·41	...	...	...	31·55	25·50
Prospect Hall... ...	...	...	...	...	5·66	...	...	...	23·6	...
Clairmont	...	...	...	...	7.39	16	1·78	29th	33·10	19·95
Equeefa	...	...	95	61	4·59	19	·91	30th	29·92	20·27
Umzinto, Beneva ...	...	...	...	...	4·67	13	1·06	31st	31·78	19·59

Mapstone Oats: Further Reports.

ON the 4th inst., Mr. Thomas Morton Ashley, Howick, wrote:— On January 22nd, 1901, I planted 50lbs. of Mapstone oats on an acre of land, but it did not germinate well owing to the seed being of poor quality and cut before ripe. The crop stood all the winter, but was not irrigated. It was cut on 1st October, yielding nine bags of seed and two tons of straw. I may say that on the same date, and on land immediately adjoining to the Mapstone, I sowed Algerian seed oats, and got the same results. The Mapstone and Algerian oats I planted are practically the same.

I return 50lbs. Mapstone seed.

On the 4th inst. Mr. W. P. Payn, Green Hill, Richmond, wrote:—I am sending you 25lbs. of seed oats in return for what I had from the Richmond Agricultural Society, and received from your department last year. I believe I am the only one that has reaped any seed from these oats. And I am sorry that what I send you is such a poor sample, which is from about 4 cwt. of forage. Although the crop was good as forage it was very light in seed. The forage had a slight attack of rust when young, but was quite clean when reaped.

On the 8th inst., Mr. R. Douglass, The Barns, Estcourt, wrote:—In the month of March last year your department was kind enough to send me 50lbs. of Mapstone oats to give it a trial. The seed was very light and poor, but came up well. Not knowing anything about the Mapstone oats, I sowed them too thick. My return from a quarter of an acre was 246lbs. of oats and 354lbs. of straw. This I do not consider very favourable as compared with others who have grown the oats supplied by your department. The straw was slightly rusted, but nothing to hurt, which was very good feed. I should like to point out that although the seed was sown in March, it does not justify its being called a rust resisting oat. The oat must have a thorough summer trial; that is, sown in December or January. I have again sown a quantity on the 31st of December, and hope to reap the same about May, when I will be able to send you a report. I grew some Algerian alongside the Mapstone, which gave me far better results; fully as heavy

again a crop and as free from rust as the Mapstone. Both, however, take too long to grow—just eight months on the land. I also grew some winter turf oats supplied by your department. In rust, I never saw anything worse. Had I sown Cape on the same land I daresay I should have reaped £40 worth of forage where I have not 40s. worth of the turf oats.

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—Nothing of importance to report since our last. There is an abundance of general produce disposed of daily on the morning market, and the genial Market master and his assistants are often at it till nearly noon. Of course, this is now the season for vegetables and fruit, and the varieties, especially of the latter, are increasing every year. It is only a few years since the Kelsey plum was introduced to this Colony, and now our market gardeners have an enormous quantity to dispose of. All connoisseurs pronounce it as one of the most luscious of plums, and as its cultivation is easy no garden should be without some of these plum trees

Mealies.—Grain is still plentiful, although many of the samples offered are of inferior quality, and prices have fluctuated between 4s. 11d. and 5s. 6d. per 100 lbs., including sack.

Forage.—Best samples from 5s to 7s. 9d. per 100 lbs.

Hay.—Some very good samples, notwithstanding the damp weather, are being offered daily, and prices have averaged about 3s 4d. per 100 lbs; bedding from 10s. to 22s. per load.

Potatoes.—The cry is "Still they come." From the quantities brought forward there must be a large area under cultivation. While some samples have been as low as 1s., 1s. 6d. 1s. 9d. and 3s per 100 lbs., better samples have realised from 4s 6d. to 6s. per 100 lbs.

Mabele.—From 4s. 6d. to 9s. 6d. per 100 lbs.

Beans.—From 4s. to 11s. per 100 lbs.

Peas.—About 9s. 3d. per 100 lbs.

Onions.—Market well supplied, and prices have been everything between 11s. and 14s. per 100 lbs.

Pumpkins.—About 3s. per doz.

Wheat.—A few very good samples of wheat have been offered, and have realised from 9s. to 12s. per 100 lbs.

Poultry.—Prices are now more in favour of the purchaser, and common fowls have been sold at prices varying between 2s. 2d. and 3s. 6d. each; ducks from 5s. 2d. to 10s. 6d. per pair; turkeys, from 3s. 6d. to 14s. 3d. each.

Eggs.—From 11d. to 3s. 5d. per doz.

Butter.—From 8d. to 1s. 11d. per lb.

Sundries.—Bacon from 2d. to 7d. per lb; ham from 4d. to 9½d.; pork from 5d. to 9d. per lb.; mutton, from 3d. to 9½d. per lb.; beef, 2½d. to 4½d. per lb.

Fruit.—Apples, apricots, bananas, grenadillas, lemons, oranges, pineapples, plums, peaches, and papaws.

Vegetables.—Beans, beetroot, cabbages, carrots, cucumbers, lettuce, marrows, peas, potatoes, rhubarb, tomatoes and turnips.

Firewood.—From 7d. to 1s. 1½d., per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade is dull to a degree, and such a small volume of business for the month has no parallel since the war commenced. Inability on the part of the N.G.R. to carry anything like adequate tonnage is mainly responsible for the present state of affairs.

Mealies.—The market is in a condition of collapse, and with the prospect of another record crop any improvement is doubtful. Prices rule about 12s. per muid locally, but buyers will neither speculate nor lay in stocks; hand to mouth is the order of the day.

Potatoes.—The foregoing remarks apply also to potatoes. The crop is phenomenal, and as large quantities of the imported article are still available, heavy losses and stagnant trade are outstanding features. Prices are nominal and paper quotations misleading. "Get what you can," is the only possible advice to farmers.

Seed Potatoes.—The writer would strongly advise farmers who may require seed to buy as early as possible. The market for imported seed is very low in sympathy with table potatoes, and it is more than possible that supplies may not be forthcoming in a few weeks. French Early Rose can be brought down to as low as 6s. a case; they may be somewhat large and require cutting, but they are none the less absurdly cheap.

Forage.—Considerable quantities are being offered and farmers may congratulate themselves that the rust bogey is in a fair way of being scotched, for a time at any rate. The importation of the invaluable Algerian oats is largely responsible for this happy consummation, and it is much to be hoped that sowing on a large scale may be witnessed during the ensuing two months.

Other lines of produce dull, and with nothing to call for special comment.

Spraying potatoes is said to be responsible for copper poisoning in Portadown, Co. Armagh. This is but a theory, yet should the spraying have been conducted too late or shortly before lifting, it is not impossible that the theory may have some basis in part. The medical authorities are communicating with the Irish Board of Agriculture.

Agricultural Chemistry for Beginners.

CHAPTER VII.

By Archibald Pearce.

ORGANIC MATTER AND CARBON.

IF we examine a portion of any living thing, whether plant or animal, it will be noticed to consist of various well-defined parts such as tubes, hairs, membranes, etc., to which the name of *organs* is given; and matter in this, which may be considered its highest form, is said to be *organised*. But organised matter is composed of various compounds; and to these substances, the materials of which organised matter is built up, the term *organic matter* is applied. At one time it was believed that no organic compounds could possibly be obtained without the agency of life in some form or other, and so a sharp line of distinction was drawn between organic and inorganic or mineral matter; but of late years it has been discovered that many organic compounds can be built up from inorganic materials, and so the dividing line is not very definite. But still the term is practically a very convenient one; and the chemist understands that in speaking of organic substances he is referring to such chemical compounds as are derived from animal or vegetable matter, even if in any special case they happen to have been artificially produced from inorganic sources. There is this restriction which must be placed upon the preceding definition, namely, that all organic substances are compounds of the element carbon. This limitation is best illustrated by an example. We have learnt that when nitrogenous animal or vegetable matter—we will now call it nitrogenous organic matter—decays, one of the products formed is always ammonia, and it might be thought that this ought to be classed as an organic compound; but the original matter contained no ammonia as such, and it was only produced owing to the processes of decay causing the original compounds to re-arrange their elements and form new combinations. Organic matter, then, may be defined as the carbon compounds which are found in animal or vegetable structures or are derived from those structures. The number of these compounds is legion; in fact they far outnumber all the compounds of other elements put together, and some of them are of very complicated construction. The chief elements that go to the formation of these organic compounds with carbon are oxygen, hydrogen, nitrogen, and in a less degree, phosphorus and sulphur. Organic matter, if heated in the air, first blackens, owing to the separation of carbon; and if the heat be increased, and the supply of oxygen kept up, it is gradually converted into various gaseous compounds, which disappear in the form of smoke, etc. We are all familiar with the result of burning organic matter such as wood; the organic portion is entirely burnt away, as we say, and only a small residue of mineral matter is left, which we call ash.

Carbon.

No one, on a casual inspection, would be likely to imagine that a diamond, the lead from a pencil, and a piece of charcoal were identically the same substance; and yet such is the fact, all three being different forms of the element carbon. The diamond is crystallised, or has a definite geometrical shape; the others are amorphous, or without crystalline form. It is true that charcoal is not quite pure carbon, containing, as it does, a small quantity of mineral ash; but this in no way alters its appearance, as may be seen by charring a piece of pure sugar, when pure carbon remains.

Carbonic Acid.

When carbon is burned, it unites with the oxygen of the air, forming the well-known carbonic acid gas, properly called carbon di-oxide, as it contains two parts of oxygen. This is an acid oxide, com-

bining with water to form carbonic acid, which is, however, so unstable a substance that it breaks up again into water and the di-oxide on the smallest provocation. The combustion of any organic substance produces carbon di-oxide; hence wood or coal fires give off large volumes of this gas. It is also produced during the respiration of animals by an exactly similar process; the worn-out and dead particles of the body are brought into close contact with the air in the lungs, and are burnt up by a slow process of combustion, the heat produced being the cause of the warmth of the living body. The decay of organic matter in the soil also produces quantities of carbon di-oxide, and the fermentation of sugar is another source of the gas. Fermentation is a process due to a low form of fungus, which converts sugar, whether ordinary cane sugar or that found in fruit and malt, into alcohol and carbon di-oxide. Since the presence of this gas in any quantity renders air unfit for breathing, we can now understand the necessity for free ventilation. With all these sources continually in action, we might expect that the atmosphere would soon become too full of the gas to support life, and this would doubtless be the case but for a kindly provision of nature whereby the balance is kept up. We have seen that plants consist largely of carbon, and this they obtain from the air by the action of their green parts, chiefly the leaves. Under the influence of sunlight, these have the power of absorbing the carbon di-oxide, separating the carbon for their own growth, and sending out the oxygen again, thus breathing in exactly the opposite manner to animals. In this way the air always keeps the same composition. It is easy to arrange a beautiful experiment to illustrate this process. Take a bunch of fresh, green leaves of any succulent plant, water-cress is as good as any, put them into a bottle, and fill it up with fresh spring water so that no air is left. The bottle must then be turned upside down with its mouth under water in a saucer, which may be done by plunging bottle, saucer, and all under the surface of water in a bucket, and lifting all out together. Then stand the whole arrangement in the sun, and in a few hours we shall notice numerous bubbles of oxygen gas clinging to the leaves or perhaps collecting at the top. Spring water always contains carbonic acid, and the leaves have been decomposing it in the manner described. Rain water also naturally contains carbonic acid, which though not very powerful as acids go, yet exerts considerable influence in dissolving many substances in the soil, and so rendering them fit for the use of plants.

Carbonates.

Like other acids, carbonic acid forms salts called carbonates, those of calcium, potassium, sodium, and ammonia being the most important. Being so weak an acid, it is easily expelled from its salts by almost any other acid. If a little washing soda (sodium carbonate) be placed at the bottom of a glass, and a little acid of any kind, even vinegar, be poured on it, an effervescence will immediately commence, due to the escape of the di-oxide. If the glass is covered with a sheet of paper, it will soon be filled with the gas; then put a lighted match inside, and see how suddenly it is extinguished, for the flame, like an animal, lives on oxygen, and dies in its absence. There is a very easy and instructive test for the presence of carbon di-oxide, for it readily combines with lime, forming the insoluble carbonate of calcium. If a teaspoonful of lime is put into a bottle of water, well shaken up, and allowed to stand till clear, we get a solution of lime called lime-water. Put a little of this into a glass, and breathe into it through a tube of any kind for a minute; you will see it turn quite thick and milky, and if left to stand for a few minutes, a quantity of white powder will settle at the bottom, which is chalk or calcium carbonate. If lime water is allowed to remain uncovered in the air it soon gets coated with a film of the same carbonate, owing to the action of the carbon di-oxide in the air.

Questions.

(1) Why are coals called "black diamonds?"

(2) Define the meaning of organic matter. Which of the following substances are organic and which inorganic:—Clay, cotton, leather, glass, sugar, water?

(3) Why is ventilation necessary in a room with people in it?

(4) Explain the difference between the respiration of animals and plants?

(5) What happens if you pour hydrochloric acid on washing soda?

(6) How can you prove that your breath contains carbon di-oxide?

(7) What is chalk? Could you distinguish by a chemical test whether an unknown white substance was chalk or not?

(8) How is the carbonic acid in the rain useful to the farmer?

A Successful Potato Grower.

INTERVIEW WITH MR. L. S. KERSHAW.

(By Ergates.)

WHEN I resolved to pay a visit to Mr. L. S. Kershaw, of "Sans Souci," it seemed to me passing strange that I could leave Maritzburg after breakfast and by rail and postcart reach my destination beyond the Kamberg—about the very *ultima thule* of civilisation I considered some twenty years ago—early in the afternoon of the day of starting. The postcart journey from Rosetta is about eighteen miles, and with the exception of the climb over Vaalkop, the road is good and in fair repair. After entering the Valley of the Little Mooi River, through which the most of the journey is made, the scenery is striking, and if the weather be clear, the traveller has a close view of the summits of the majestic Drakensberg range. After leaving the station, for an hour or so the heat, even at this altitude, was intense. Then a dark cloud was to be seen over by Giant's Castle. It rapidly grew in size, and became the centre of a thunderstorm. We could distinctly see it splitting, one half going Maritzburg way and the other down the Bushman's River Valley. A patch of the latter caught us. The wind was almost of hurricane strength and of icy coldness. Ahead there was no rain, and through the clear atmosphere, at a distance of five or six miles, we saw a flash of lightning descend as straight as a plumb line. Next day I saw two oxen belonging to Mr. J. W. Bentley which that flash had killed. Within a mile or two of the road many homesteads may be seen, and among others those of Messrs. J. Gillit, James Henwood, K. Grobler, W. Doney, E. Ratsey, G. C. Robinson, H. Laing, O. Hosking, Vanderwesthuisen (four), J. E. Robinson, A. L'Estrange, W. T. Trafford, and J. W. Bentley. At points along the road, poles, bearing post bags, are to be seen. The postcart is driven underneath and from his seat the driver unhitches or hangs the owners' respective bags. The fare, 5s. for a good 18 miles, is by far the cheapest I have yet come across in South Africa.

Potatoes.

Mr. Kershaw is one of the most successful potato growers in the Colony, and upon potatoes nearly all our conversation was centered. Mr. Kershaw came to his present farm, "Sans Souci," in 1892, having previously farmed in other districts, and, still earlier, he ran transport.

"To what," I asked, "do you chiefly attribute your success?"

"To three things; first, good land; second, the climate; and third, my system of cultivation."

"What made you go in so largely for potatoes?"

"Five or six years ago there was a good demand for them, so I put in a couple of tons of 'magnum bonum' seed, and I

reaped 550 bags. They averaged 10s. per bag of 150lbs. The quality of the potatoes and the yield were so satisfactory, that I decided on planting on a bigger scale. Last year I got from one particular acre 119 bags, but the average was about 100, and the average price was 18s. All the land of the Little Mooi River flats, although it differs in degree, is first class, and on this farm I have a good share of it. It is sandy loam, alluvial and rich in humus. At present I am manuring with chemicals, but soon I shall also go in for green soiling.

CULTIVATION.

"What will this year's crop run to?"

"I expect close on 4,000 muids."

"And your system of cultivation?"

"My system comes from observation, reading, and my own experience, and I am always on the look out how to improve. I am a close observer, and keep notes of any changes I may make. In June or July I plough the land if I can possibly manage it, because of the benefit to the soil and because winter ploughing keeps down the cut-worms. This pest has been exceptionally bad this year in the Mooi River district. The planting begins in September, and goes on into October. I plough the land and give it four or five harrowings to get it into good tilth. The planting I do with a potato-planter. You have seen the planter; it makes the drill, puts in the fertiliser, puts in the seed potatoes at regular distances—10 inches, as a rule—and covers up the drill all in one operation. With a home-made roller —the trunk of a bomvaan tree—I then roll the field flat. Then I give two weedings with a weeder—one of the most useful implements a farmer can have—then I go with a searifier between the rows, then I earth up with a double mould board plough, then I give two more weedings—no, there is no danger to the haulms at that stage—and then, the field being flat again, I finally earth up. Yes, it is a lot of cultivation, but it pays. Potatoes want any amount of cultivation, and as you yourself have seen, there is hardly a weed to be seen in the fields. The only way to tackle weeds with the weeder is to catch them just as they begin to show themselves."

"What depth do you plant?"

"About two inches, and those who plant deeper make a great mistake, in my opinion."

"Why ridge up, and knock down again with the weeder?"

"Because it is the most effective way of keeping down the weeds."

"Do you cut your seed?"

"No. This subject is an important one. Cut seed do not suit this country, and unfortunately for the imported seed potatoes, would each give at least two setts. I have tried year after year to get small seed, but never succeeded. The bill for imported seed, if planting for a crop, is a big one. This year mine will come to over £200, each ton costing at Rosetta £15. If instead of sending table potatoes, seed of only a half or a third of the size were sent, one would get as much land in at half or a third of the outlay. With seed that has sprouted, I have made some experiments. Seed that is beginning to sprout for the first time gives much the best crop. When the second lot of sprouts come—the first having been knocked off—the return will be much smaller, and seed planted after the third sprouting will yield barely half a crop. The seed, as I have said, are forked in by the planter every ten inches apart, and the rows are, as a rule—depending on the class of potatoes—2 feet 6 inches from each other. And here is something potato growers do not know of, or are apt to forget, the direction of the rows. The direction should, if possible, be from east to west. If planted in that direction, they get all the sun; planted from north to south, one half side of the plant is for the most of the day in cold shade."

"How do you store the potatoes?'

"I keep them sacked in sheds, digging them in May and keeping them till September. Potatoes deteriorate if kept together in large quantities. In this district we can keep them the whole year in the ground if we wish; that is, planting in September and digging them in the September following. Seed that I like is from one ounce to two ounces, and sound —not the least withered."

Manure.

"What is your fertiliser?"

"I have been using Fison's, but this year I have gone in for dissolved bone, using about 6 cwt. per acre. No, I do not use yard manure for this reason, that I have got practically none. I do very little kraaling, the stock running day and night in paddocks. Of course, stable manure is grand for potatoes, but what I get is not worth taking into account. Straw or hay is exeellent for the common way of planting. One year I put into some furrows the remains of a stack of hay from which the cattle had been feeding during the winter. The superiority of the crop from those furrows was most striking."

Kinds of Potatoes.

"What kinds of potatoes have you grown?"

"Early Rose, Magnum Bonum, Imperator, Skurry Blues, Beauty of Hebron, Ninety Fold, Flour-balls, Reliance, Centenary, May Queen, Ringleader, German Blues, Up-to-date, Gold Finder, and Red Roughs."

"And the best?"

"The Imperator; it is white, it is the heaviest cropper, and is far away the best I have grown. Of course I am speaking of this district and of my conditions as to soil and system of cultivation. Very likely if I were in another district, experiments might lead me to prefer another kind. Whom do I import from? Sutton and Sons, and except in the matter of size, I find them very satisfactory. Flour-balls are pink, and something like the Early Rose, but rounder in shape, and are very good croppers. Magnum Bonums are also good croppers. The Early Rose is not regularly a good cropper. Up-to-dates are good in shape and good croppers. The Red Rough is a good potato, but a poor yielder."

"Considering the price, why are you so heavy a purchaser of imported seed?"

"Because potatoes quickly degenerate in this country. After three years, they distinctly fall off in size, shape, and yield."

"You speak of the degeneration of potatoes in this country—a point on which I know you would be supported by practically all potato growers; do you not think that the degeneration in a measure is due to the common practice of planting small seed?"

"No; I do not, but I must admit that very small seed do give a larger percentage of small potatoes."

"Have you ever tried dusting cut setts of big potatoes with slack lime—a plan which is claimed to prevent or delay the rotting of the setts?'

"No; my experiments with cut potatoes, but not so dusted, have been failures. In December and January cut setts rot much quicker than if planted earlier in the year. The rotting of the setts is always quickly followed by blight. It is the hot sun of this country, in my opinion, that rots the setts."

Implements.

Mr. Kershaw is one of the most progressive farmers in the Colony as regards machinery. In a broad shed, some 90 feet long, I saw in farm implements what represented over £500 in money expended. In connection with this subject, I must not omit to state that the labour is chiefly coolie. I may also mention that for all kinds of field work Mr. Kershaw prefers oxen to horses. He holds that oxen are cheaper, both as regards cash value and as regards feeding, etc., and that for the labour of the Colony they are the more suitable.

Potato Planter.

The planter comes from the Aspinwall Manufacturing Company, Jackson, Mich., U.S.A., and costs, from the agents, Messrs. G. North and Son, Durban, about £21. Mr. Kershaw speaks of it most highly, and says it saves labour greatly. It has in his eyes one serious defect; the fertiliser runs out at 600lbs. per acre, a quantity he considers unnecessarily large for his soil. If the orifice is decreased in size for lessening the distribution, then the fertiliser clogs and stops running. He suggests that the manufacturers should see to this defect.

Potato Raiser.

The potato "raiser," or digger, is of Scotch make—Jack & Sons, Maybole,

Scotland. If imported direct, the price is about £16 5s., and, if bought locally, £22. The principle is simple: a plough sort of ploughshare travels under the potato ridge and loosens all above it. Immediately above the share there is a wheel with iron arms which revolves at a great rate. The arms, divided at their ends into what I might describe as two huge fingers, send the loosened potatoes flying to the side, the flight of the tubers being limited by a screen of short sticks, like broom handles, which hang some three or four feet from the middle of the machine. Mr. Kershaw was good enough to show me the raiser at work, and I was greatly struck with its efficiency. Only two oxen were inspanned, the object being merely a demonstration; for continuous work, however, four are desirable. I also saw the machine dragged over as awkward a lot of boulders, which constituted the drift of a spruit, as one can well conceive, and it did not come to grief. Mr. Kershaw saw nothing in what I considered very rough usage—which in its way is testimony to the substantial character of the manufacture. Mr. Kershaw believes he was the first in Natal to use a potato raiser.

2-Furrow Plough.

Among the various ploughs, 1, 2, and 3-furrow, a 2-furrow came in for warm praise. It was of Ransome's make, Eagle 75.2, and can be purchased from Messrs. Steel, Murray & Co. for £7 15s. With disc coulters (which are not necessary, but lighten the draught) the price is £2 more. "It is," said Mr. Kershaw, "a first-class plough in every way, its only defect being a liability to topple over when turning. The piece of scantling that you saw I have tied across the top stops that however. Use my 3-furrows? No; that 2-furrow is easily worked with six oxen; for the 3-furrow I should have to put in fourteen."

Ridging Plough.

"For ridging work I find the D.C.I., sold by Messrs. Paul Henwood, in every way first-class. It has three sizes of shares. It is worked with a couple of oxen, or a horse, if preferred."

Harrows, &c.

"That spring-tooth harrow, which I got from Messrs. Steel, Murray I find very serviceable for tearing up soil and to save ploughing—when the land is in a fit condition. It is very useful. The latest ones have plates at the end of the teeth which can be renewed as required, and purchasers should see they get that kind. That lever peg-tooth harrow is very good for light work, the lever permitting of the teeth to be set at any angle; the three parts cost about £10. As to weeders, there is none better than that first described in the *Journal* by Mr. John Marwick. My scarifiers are of the usual class."

Forage Press.

"My forage press is a Macdonald, Maritzburg. It is a very good make; price £18."

Mower and Reaper.

"My mower and reaper is a McCormick. I gave £21 in Durban for it, and in every respect I like it. My 'Daisy' self-delivery reaper cost £26 10s.—works excellently."

Hay Rake.

"This double-pressure hay rake works splendidly on an uneven ground. The double pressure is easily given with the foot lever and is very useful. It is the best hay rake I have seen. The agents are Messrs. G. North & Son, Durban."

Mealie Planter.

"I do not plant many mealies now, for I find it more profitable to buy the mealies required and sell potatoes, but for mealie cultivation, that Eureka planter is first-rate. The fertiliser attachment works well, putting in as desired, from 150lbs. to 600lbs. It cost £12 10s. The lever for lifting the front wheel makes turning easy. The agents for this machine are also Messrs. G. North & Son."

The Harvester.

This big and expensive machine, costing £150, was bought just before the epidemic of forage blight, and has hardly been used at all. From the way, however, in which it did its work, Mr. Ker-

shaw is highly pleased with it. The makers are Messrs. T. Robinson & Co., Spottiswood, Melbourne, and the name is "The Federal Combined." When working, it presents to the crop, wheat, oats, barley, etc., a series of flat steel fingers. The straws of the crop slide between them, and as soon as the limit of the fingers is reached, beaters revolving just above knock the corn off the heads. The corn is then winnowed perfectly—only perfectly winnowed can travel up the second and final elevator—from that elevator it streams into sacks. When at work the noise may be heard for a mile or more."

Potato Riddlers.

Of potato riddlers, Mr. Kershaw has a series of different gauges. The screen is about six feet long, and the slats, over which the potatoes travel, are one inch thick and sloped off to half an inch on the lower side, and the distances apart on the cross pieces to which they are nailed vary on the different riddlers from one inch to one and a half inches. The upper end of the riddler is suspended by a reim about seven feet above the ground, and the lower part rests on the sack stand. Beneath the lower end of the riddler is fixed a bit of wood three inches thick, which serves as a sort of balance, and enables a jigging motion to be given to the screen with very small effort. The screens are home-made, and the making, to anyone handy with tools, should present no difficulties. With six boys, 200 bags can be riddled and sacked with one of these riddlers in a day.

Forage-Bundle Trimmer.

The necessity or desirability of trimming, or giving a good butt-end to bundles of forage is well known to most. For this object Mr. Kershaw has made himself a cutter which trims off as much as desired of the loose ends. It looks something like a carpenter's stool for sawing, but instead of a solid piece of wood for the top there are two pieces about a quarter of an inch apart. Between them works a "lightning" hayknife, which has had the handle straightened out; the end works on a bolt. A two foot piece of scantling, rising perpendicularly above the stool, guides the knife steadily in its descent. Of these two useful and simply constructed machines, illustrations will probably be given in a future issue.

Various.

Among other machinery, etc., I noticed a large stationary thrasher and winnower, cutaway harrows, horse-power gear, bellows, and anvil, etc.

Conclusion.

It is as a successful potato grower that Mr. Kershaw is best known, and this "interview" is practically confined to that subject. I must add that although Mr. Kershaw speaks with decision on most points in connection with potato cultivation, yet, in all his observations, he rarely if ever omits to point out that other methods and other varieties of potatoes may better suit districts other than his.

Chewing's Fescue Grass and Wheat.

IT should have been stated in the last issue that this seed was kindly sent through the Cape Government by the Secretary for Agriculture, New Zealand, who also supplied the samples of wheat referred to, which are of the following varieties:—

Spring Wheat: Zealand, Marshall's No. 8, White Tuscan, Bearded Quartzlee, Early Boast, Early Para, Budda Early, Tall Neapolitan.

Autumn Wheat: Allora Spring, Bearded Harrison, Fultz, Improved Fyffe, Sicilian Square Head, Blountz Lambrig, White Velvet, Tardent's Blue, Pearl Velvet, Darblay's Hungarian.

Winter Wheat: Tallavera de Bellevue, Mediah, Mashall's White Chaff, Anglo-Australian, White Essex, Red Clawson.

A bag of "Danthonia Semiannularis" grass seed has also been forwarded by the New Zealand Government, and samples will be sent to anyone wishing to make trial of them.

Indigo Manufacture.

SUGGESTIONS BY PROFESSOR RUDOLF.

(*Concluded.*)

Preparations for the Market.

THE slab of indigo is carried to the cake-house on a stretcher by two men; here it is marked out into squares, and cut up with a fine brass wire. On each cake a stamp is impressed, showing the factory mark and a consecutive number indicating the day of manufacture, reckoning from the commencement of Mahai. These cakes are then placed on shelves made of bamboo slats, and are turned occasionally during the drying process, which lasts some weeks.

In drying indigo no artificial heat is employed, the cakes being merely left in the cake-house goti ghur , the temperature of which is kept as equable as possible by opening and closing the numerous shutters with which the house is provided. In damp weather a heap of quick-lime is sometimes used to hasten the drying.

When the cakes are dry, a specimen of each kind manufactured is sent down to one or other of the indigo market in Calcutta, where they are assorted, and the planter receives a list directing him which of the cakes are to be packed together. This assortment list is merely a series of the numbers marked on each day's cakes, commencing with the best and finishing with the worst. The indigo is packed in strong chests made of mango-wood, which chests, after being marked with the gross weight and tare, are commonly despatched to Calcutta for sale at the indigo auctions, which are held in November, December, and January.

Of late years the practice of shipping indigo to London for sale has been adopted by some factories.

The Calcutta indigo auctions are attended annually by a large number of indigo buyers, who come fully instructed as to the special marks and qualities which they are to purchase for their employers. Until recently the market value of the indigo was decided by the appearance of a freshly exposed broken surface of a cake, and more or less by the factory mark which it bore. From an analytical determination of the amount of indigotin contained in the sample, it is not difficult to form a very correct opinion as regards its suitability for dyeing purposes and its market value. It is to be remembered, however, that the market value of an indigo does not at present absolutely depend upon the percentage of indigotin which it contains; there are other factors which rightly or wrongly go to decide its worth. The amount of indigo-brown contained in a sample is said to exercise an influence in modifying the shade which the indigo gives; but this appears doubtful, for in most dye vats the reduction process used would leave the indigo-brown as an insoluble precipitate. Indigo of a good violet colour is usually a high-priced commodity, but whether the special shade of the indigo cake has any connection with the shade ultimately obtained on the cloth seems rather an open question. Again, the smoothness of the paste or grain of indigo is considered to influence its value; but it is possible that sometimes the roughness of a bad paste is caused by impurities, although there is no reason to suppose that this is always the case. It is quite possible to prepare an indigo of good quality, rich in indigotin, which acts satisfactorily in the dye-house, but which would have a very low value as determined by its external appearance; the converse is also true. For some years past it has been felt by many interested that judging the value of an indigo by its external appearance and physical properties is not a satisfactory basis for commercial purposes. Planters consider that in some cases their indigo has not fetched its real price, while the buyers have a feeling that they are purchasing more or less in the dark. But while it is true that some indigos have been sold below their true value, it must be also remembered that other indigo must have fetched a price above what it would have done had its value been determined on an analytical basis.

There are two factors which have prevented the adoption of the analytical basis of valuation more than anything else. One is a want of some standard and recognised method for the determination of percentage of indigotin ; the other is vested interest. The first objection should be easily overcome, as while widely differing results are apt to be obtained when different methods are used, when two expert operators use the same process identical results are obtained. It does not matter very much whether the figure obtained represents the actual percentage of indigotin ; it is only necessary that when the same sample be examined by several analysts, their figures shall agree very closely.

The writer has found that the method in which indigo is dissolved in concentrated sulphuric acid, the solution diluted to a known volume, aliquot part removed with a pipette, the indigotin precipitated by saturation with common salt, and the resulting precipitate dissolved in dilute sulphuric acid, titrated with permanganate of potassium, has given the most constant results. This method is rapid, and any intelligent educated native of India can be taught in a few weeks to use it so as to obtain results in which for the same sample the percentage of indigotin will not vary more than 0·3 per cent. It is absolutely necessary that this or some other method should be used as a basis for the buying and selling of indigo, that some agreement shall be come to among the analysts, and that the fullest and minutest directions as regards strength of acid solution, the amount of dilution, size of dishes, and time shall be published. As regards the second objection—*i.e.*, the use of an analytical basis—it is to be remembered that while some indigos would obtain their price, other indigos bearing old and well-known favourite marks would not sell at such good rates as in the past; and those interested in the long established indigo auction business in Calcutta might suffer in pocket. There is also another argument in favour of buying and selling it on a more scientific basis than that at present in vogue. It is this : Many attempts have been made to improve the manufacture of indigo as regards quality and quantity produced, but hitherto the great difficulty has been that any alteration in the method of working was likely to yield an indigo differing more or less in physical appearance from that usually sold at the Calcutta auctions. In consequence such indigo, however rich it might be in indigotin, and however suitable for the purpose of the dye, was apt not to find a good mart. There have been fashions in indigo as in everything else, and it is almost impossible for any improvement to be made in the factory so long as the price of the product is to be made dependent upon some minute difference in shade or other physical appearance. It is not likely that if an analytical basis comes into general use the European indigo planters, most of whom are interested in Behar factories, are likely to profit directly from the change. But the real advantage which the planter would reap is this, that with a sound and unvarying basis for the buying and selling of his produce, based upon chemical principles, he will be able to employ the aid of chemistry to help him to obtain larger yields and a purer article, without the fear that his indigo will be unsaleable on account of its looking a little different from what has appeared before in the Calcutta market.

Of late years the economical production of artifical indigo has appeared to threaten the planting industry; that such a danger is real no thinking person can but admit when one considers the disastrous effects which the introduction of alizarin had upon the madder planting industry. How long will it be before the artificial indigo is put on the market at such prices and in such quantities as to render indigo planting an unprofitable undertaking no one can prophesy, but it appears that if the planter working on the present unscientific system is able to produce indigo at a lower price than the artificial product with a good margin of profit, as is done at present, that if the industry was to be run on thoroughly scientific lines, such a further reduction in cost of production would result as to render it impossible for the artificial indigo to compete with the natural for many years to come. Of course no one but those chemists investigating artificial indigo can know what the actual cost of production is, and there is no certainty at what time artificial indigo will be on the market at a price lower

than the natural. But nevertheless it appears certain that if the chemistry of the production of indigo from the indigo plant was to receive a thorough investigation, extending over at least five years, and the factories were to be worked in a scientific manner, that the cost of production would of necessity be materially reduced, and that for many years to come the natural would be able to compete with its artificial rival. But the danger is, the indigo planter will neglect the chemistry of his industry, so that when a keen competition arises between the indigos, and he calls in the aid of science, several years must be occupied in investigation before any suggestion can be given for the increase of the yield, and in the meantime many may be ruined by the bad years.

The late Anthony Wilkinson.

IN No. 15, Vol. IV., appeared an Ergates' interview with the late Mr. Anthony Wilkinson. This will be found well worth reperusal, for Mr. Wilkinson's views and actions were all characterised by shrewdness, commonsense, and originality. In No. 17, Vol. IV., appeared an article from his pen advocating experiments for the cheap extraction of rubber from systematically cultivated indiarubber producing plants. In the near future it is not at all improbable that the system he advocated may be practically carried into effect. Subjoined is an obituary notice from the *Mercury*; some other particulars of his early life may be found in the interview referred to above:—

"By the death, on the 1st February, of Mr. Anthony Wilkinson, Victoria County has lost one its oldest and most progressive residents, and Natal an esteemed colonist. Originally a navigator, being master of a sailing vessel, he arrived in this Colony from Canada in the 'fifties," and settled in Victoria County, where he acquired land, and we believe embarked in coffee-planting, ultimately, like the majority of his contemporaries, when the coffee enterprise proved unsatisfactory, entering upon the sugar industry. Reminiscent of his association with Canada, he named his sugar estate Ottawa, and has there successfully prosecuted cane-growing, sugar manufacture, and distilling. A man of fine physique, and of much intelligence, he appeared much younger than he really was, and those to whom he was not intimately known would not have credited him with four-score years; yet such was the ripe old age to which he attained. Although for many years past living a more retired life, he always took an ardent interest in the affairs of the Colony, and the columns of this journal have borne testimony thereto by his numerous short practical letters on various topics. He was an active member of the old Victoria County Planters' Association, and in matters affecting the sugar and kindred industries he proved that he studied deeply, and was not content with superficial knowledge. In afforestation he took great interest, was well informed on the subject, used his influence to promote it, and introduced many species of trees new to the Colony, but which he believed would prove of practical value. In the earlier years he identified himself with the volunteer movement, and was captain of the Victoria Mounted Rifles. A frequent visitor to this town, he took much interest in it, and often made sugestions for its benefit. The past twelve months had been very sad for him, having lost a daughter, a brother, and about three months ago was bereft of his wife. He leaves several children, one of whom is the wife of the Chief Commissioner of Police, Mr. G. Mansel, C.M.G. Called hence in the fulness of years, and after a busy life, the Colony has to add to its obituary of pio-

neer colonists the name of one whose memory will ever be cherished with respect."

"Arator," in the *Advertiser* writes:—

"Residents in the Division were shocked on Sunday morning by receiving intimation that Mr. Anthony Wilkinson, of Ottawa Estate, had passed away, and was to be buried that afternoon in the Verulam Cemetery. In spite of the short notice, and it not being possible to use the telegraph, the attendance was large, some seventy residents of the Division from Tongaat to Umgeni being present. The deceased gentleman was the sole survivor of the pioneer sugar planters of Natal to pass away on the estate which he settled on on his arrival in the country in the early '50's. I think I may say in the whole Colony, but certainly in Victoria County, Mr. Wilkinson brought with him from America, where he farmed for some years, the American idea of saving labour, and the use of labour-saving appliances, and he did much to demonstate how such implements could be used even on rough land, and so save hand labour. He introduced on a large scale the cultivation of leguminous plants in his old cane fields, and may be said to be the pioneer of this culture, which, it cannot be doubted, is destined to be as great a factor in land restoration in this country as it has proved elsewhere. The deceased gentleman reached the ripe age of 80, and was on horseback up to within a short time of his death. His well-known presence will be greatly missed, and much sympathy is felt for his son, who has suffered so much domestic loss during the last few months."

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released on the 4th March next :—

Isigingo. — Chestnut horse, aged, branded on neck JU (joined) near side, W off side.

Pietermaritzburg.—Bay gelding, height 14.3, white star on forehead, old scar on nose, branded NK off shoulder, NC on near fore foot, aged.

Chestnut pony, mare, white stripe on face, white spot on nose, old saddle marks, has been down near knee, shod on fore feet, height about 13.3, aged, no brands, square cut tail.

Bay gelding, height about 14.2, flee bitten, white star on forehead, white leg near hind, white heel off fore, old saddle sore, square cut tail, aged, no brands.

N'konjeni.—Heifer, white, 18 months old, no brands ; heifer, black, 18 months old, white belly, no brands ; toli, black, one year old, white nose, no brands.

Estcourt (on farm of Mr. R. Streit, of Emeagweni)— One small black mare, age three years, small white star on forehead, left hind foot white.

Eshowe.—Black young ox, about three years old, white legs and under belly, brands looks like =.

Highbury, Polela (on farm of Mr. G. Malcolm, "Brooklands.")—Chestnut filly, about two years old, blaze, branded C on near hind quarter, ƃV on off hind quarter, both brands distinct.

Richmond Road. — Light bay mare, about 13·2 hands, lop-eared, white stripe on nose, mark of sore back.

Mr. James Thorrold, Sunday's River, writes : On 30th ult. I had a fowl's egg brought to me to weigh and measure. Results: Weight., 3 oz. ; latitudinal circumference, 6¼ in.; longitudinal circumference, 7⅜ in. Neither geese, turkeys, nor ducks are kept on the farm, so a hen must have laid it.

Says the "Indian Planters' Gazette":—"We have advocated for years that more scientific methods are requisite in the manufacture of tea, and that in this way, to some extent, the evils of the present depression may be partially averted. Indigo has felt the pinch and is setting its house in order, with the prospect that it will be able to compete on satisfactory terms with its German rival. Tea must arise and do likewise, and by every scientific means possible so improve its quality and reduce its cost of production as to raise itself once again to one of the most paying industries of India."

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	R. C. O'Neil ...	Hillgrove.
		,,	B. J. Wilkes ...	Portington.
		,,	Du Plessis & Cloete	Compensation.
		,,	J. Van der Merwe	Welgekoose.
		,,	J. Snyman ...	Vitzecht.
		,,	W. Ralfe ...	Ernersdale.
		,,	R. M. K. Chadwick	Beechwood.
J. Button ...	Estcourt, South of Bushman's River	,,	S. Nel ...	Wagon Drift.
		,,	L. Berthon ...	Littlecote.
		,,	J. C. Boshoff ...	Waterhoek.
A. H. Ball ...	Weenen ...	Lungsickness	C. Harding ...	The Plains.
		Scab	W. Lotter ...	Doornkloof.
		,,	P Van Rooyen ...	Middleburg.
		,,	C. P. F. Van Rooyen	Mona.
E. J. B. Hosking ...	Upper Umkomanzi	Lungsickness	Maboko	Bushman's River Poort.
		,,	J. Baynes ...	Meyer's Hoek, Onrust, and Nel's Rust.
J. J. Hodson ...	Lion's River ...	Scab	H. W. Shaw ..	Talavera.
W. Wilson	Polela	,,	C. A. Phipson ...	Macedonia.
		,,	G. Houston ...	New Bigging.
C. E. Hancock ...	Ixopo	,,	C. L. Hammoud ...	Sunrise.
		,,	Quinisani	Arundel.
		,,	Mapundu	Springvale.
		,,	E. H. Surridge ...	Chadwell.
		,,	Makuko	Umzimkulu.
		,,	W. Gray	Helmsley.
		,,	J. R. Royston ...	Umgodi.
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	Kamana	Sand Pits, Town Hill
		,,	H. H. Boden ...	The Knoll, Hilton Rd
		,,	Mrs. Rea ...	90, Pietermaritz St. Pietermaritzburg.
		,,	N'cundane ...	ZwaartkopLocation
J. A. Morrison ...	Durban & Umlazi	,,	P. Saville ...	Umzimbazi.
		,,	W. Pearce ...	Lower Illovo.
		,,	Natal Government	{ Vet. Compound,
		,,	Australian Heifers	{ Durban.
L. Trenor ...	Alfred ...	Scab	J. Wessels ...	Sheepwalk.
		,,	C. J. Triegaart ...	The May.
W. C. Robbins ...	Lower Tugela and Mapumulo	Lungsickness	Jackson & Dykes	Sunbury.
		,,	F. Addison ...	Addington.
		,,	Thring & Bull ...	Langspruit.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	,,	Natives	Hongerspoort.
E. Varty ...	Umvoti, Western Portion	Scab	J. M Van Rooyen	Pompoennek.
		,,	P. Otto	Somerville
		,,	G. Nel, jun. ...	Summerfield
A. S. Parkinson ...	New Hanover ...	,,	Umshola & Makenke	Swaimana's Location
		,,	R. Smith	Effingham.

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

The following farms are in quarantine for rinderpest :—

Ladysmith Division.—Farms : Riet Kuil, Kleinfontein, Vlaakplaats, Doornkraal, and Zwaartkloof.
Upper Tugela Division.—Farm : Earthcote.
Newcastle Division.—Farms : Normandien District, Hope Farm, Lennoxton, Ingogo, and Charlestown.
Dundee Division.—Farms : Aviemore, Lincoln, and Swiss Valley.
Kranskop Division.—Farms : Jammerdaal, Frogmore, Elandsvlei, Entombeni, Sutherland, Buffels Hoek, Elands Kop, Drifontein, Scottsdale, Woodlands, Paul's Rest, and Middle Hoek.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 12th February, 1902.

Indigo Notes.

By ALEX. PARDY, F.C.S.

THE subject of indigo growing, with its possibilities, is being brought before us again, and the knowledge that we possess seed-bearing plants of the finest sought after variety for production of the dye, show that it has every possibility of attracting attention, and attaining the distinction of a valuable industry, provided it can be shown that the plants will thrive in our Colony.

The indigofera is a leguminous plant, and probably would form a good rotation crop in the renewal of sugar lands. The change would recuperate the land, and the necessary and altered cultivation would have its due beneficial effects, and if there were any possibility of working in the crop with sugar cane, or on cane lands, the same, or prepared, tanks might be used for the extraction of the indigo, and the labour diverted during the less busy times to its manufacture.

A few notes in the "Journal of the Imperial Institue," entitled "Extraction of Indigo in Sugar Factories," suggested these remarks. They read:—"At the present time, when considerable attention is being directed to the indigo industry in India, planters have been advised to combine sugar cane planting with the cultivation of the indigo plant. The 'Pioneer,' for July 18, 1901, contains the letter of a correspondent who goes a step further, and suggests the erection of plant which can be used for cane sugar manufacture, and equally well for indigo production.

"He puts forward a strong case in favour of the diffusion process for the treatment of the sugar cane, the only disadvantage being the need of more fuel for the evaporation of the extra liquid; while the process has the advantage of producing a greater yield of white sugar of a better quality than that obtained by crushing the cane in mills; further, the diffusion process is, much more than any other, suitable for the manufacture of sugar from beet, an industry which, he asserts, will occupy a prominent position among Indian sugar growers in the near future.

"Having drawn attention to this point, in favour of the diffusion process for sugar manufacture, the correspondent considers that the diffusion batteries, after they have worked off the sugar cane, will be found to satisfactorily replace the steeping vats in the indigo process. Not much is known at present as to the correct conditions of steeping, etc.; in fact, it is generally admitted that the total content of the plant is not all obtained by the process as usually carried out. The diffusion would be a continuous washing, or steeping, carried out until the plant

was exhausted, and it could be rendered still more efficient by the use of hot water, as recommended by Dr. Schutte, who found that a larger and better yield was obtained thereby, although his experiments were handicapped by the open air vats in which they were carried out.

"If it is found that the fermentation, which is supposed to go on in the steeping vat, does exist, and is a necessity, then it is likely that the diffusion batteries would be useless, as they do not permit of prolonged contact of the plant with the same portion of water. Under those circumstances, a complete double steeping in an improved steeping vat should answer the question more satisfactorily.

"Therefore, either of two methods is required:—First, a more thorough steeping; second, a diffusion process which can be continued till tests show that no more indigo is being extracted from the plant."

Garden Notes for February.

By W. J. BELL, Florist and Seedsman.

IN the midlands the winter crop of Peas and Broad Beans should be sown this month. The best sorts of peas are Yorkshire Hero, 2½ feet; Pride of the Market, 2 feet; Harrison's Glory, 2½ feet; and Doctor McLean, 3 feet. For colder districts the Black Eye is the best to sow a little later for a spring crop. Where there is any frost the other above named varieties should not be sown later than middle of March. The soil for Peas should be rich, deep and friable, and should contain a proportion of calcareous matter. If this is absent give a dressing of lime, or lime rubbish and burnt garden refuse. Of artificial fertilisers, bone-dust or fish manure will be the best if mixed with the soil at the bottom of a deep drill, and covered with quite four inches of soil. The drills should be from 2 to 2½ feet apart, and 1 lb. of seed will sow about 40 feet of drill. In the event of prolonged dry weather, water must be supplied in good time, and in liberal quantity. In giving water the best plan is to open a shallow trench about a foot distant from the rows on the shady side, and in this pour the water so as to fill the trench; by this method water and labour will be best economised, and the plants will have the full benefit of the operation.

Sow Broad Beans in double rows, the two lines forming the double rows may be 4 inches apart and the seed 2 inches deep. About 2 feet should be allowed between the double rows. In preparing the ground plenty of well-decayed manure should be dug in between the first and second spit, and a little lime or wood ash afterwards raked in near the surface. The lime should not be mixed with the manure.

The pinching out of the tops as soon as there's a fair show of blossom is a good plan. If the plants become infested with fly, syringe with lime water.

The main crop of Celery should be planted out this month. Celery must have rich soil, abundant moisture, and must be blanched to make it fit for the table. The ground should be laid out in trenches one foot deep, which should be filled up with well decayed stable manure, and good soil thoroughly mixed in equal proportions. The overplus of soil should be retained on each side for the purpose of earthing up when the proper time arrives for blanching. The trenches should be about 18 inches wide, and four feet apart from centre to centre.

The planting should be done in suitable weather, each plant being carefully lifted with a trowel and planted along the centre of the trench 6 to 9 inches apart, applying water as planting proceeds so that there may be no check. If dry weather ensues, water must be freely given, but there must be no earthing up till the plants have nearly made their full growth, for the earthing pretty well stops the growth, and is but a finishing process, requiring several weeks to bring the crop to perfection.

The winter crop of potatoes should be planted now without delay; also a last sowing of dwarf Beans if required.

Make successive sowings of Lettuce, Carrot, Turnip, Beet and Radish.

Where Strawberry beds are required this month is the time for planting the young rooted runners from the old beds. The best soil is a rich moist sandy loam, but a heavy soil will answer if it is well prepared.

The ground should be trenched and heavily manured with rotten dung placed between the top and bottom spit, where the plants will reach it when they are most in need.

In stiff soil it will be advisable, when the trenching is completed, to put down the line and cut shallow trenches, which should be filled in with rotten manure, and any decayed stuff from the garden.

In a well cultivated soil there will be no need of such a special preparation, but in any case a good digging and a liberal manuring are absolutely necessary.

After the plants have obtained a firm hold of the soil allow it to remain firm and compact near the roots.

As a rule the rows should be two feet apart, and the plants 18 inches in the rows. It is a good plan to have a three-feet space between every two rows for necessary traffic.

Coal Returns.

Return of Coal raised and labour employed at the Natal Collieries for the month of January, 1902 :—

Name of Colliery.	Labour Employed. Above Ground.			Below Ground.			Unproductive Work.			Coal raised.	
	E.	N.	I.	E.	N.	I.	E.	N.	I.	tons.	cwt.
Natal Navigation ...	15	15	180	14	170	224	4	0	6	11,139	6
Elands Laagte ...	11	19	107	10	129	292	0	0	60	10,016	0
Dundee Coal Coy. ...	14	20	102	13	66	336	0	0	58	8,622	11
Natal Marine ...	11	82	18	7	262	8		...		6,803	2
St. George's	12	128	22	6	137	46		...		5,252	0
Crown	7	48	4	5	107	1		...		2,240	0
No. 42	8	28	7	2	88	0		...		1,830	0
Newcastle	4	14	11	4	134	0		...		1,821	8
Natal Coal Estate Synd...	5	6	4	2	48	6		...		760	10
Ramsay	2	14	0	1	47	0		...		756	0
Natal Steam Coal ...	4	36	8	3	48	1		...		640	15
Central	3	4	20	2	3	51		...		617	16
West Lennoxton ...	1	3	3	1	7	17		...		502	3
East Lennoxton ...	1	0	5	1	3	10		...		283	0
New Campbell ...	0	1	1	1	1	5		...		124	0
Hillside Colliery ...	0	4	0	1	6	0		...		108	14
Total	98	422	492	73	1,256	997	4	0	124	51,516	17
Corresponding month, '01	89	480	397	59	1,510	629		...		40,557	2

Mines Office,
February 8th, 1902.

CHAS. J. GRAY,
Commissioner of Mines.

Return of Coal bunkered and exported at the Port of Durban for the month of January, 1902 :—

	tons.	cwt.
Coal Bunkered	22,244	10
Coal exported to Cape Colony	2,077	16
„ Delagoa Bay	30	11
Total	24,352	17

Custom House, Port Natal.

GEO. MAYSTON,
Collector of Customs.

Six Months as a Stableman in California.

By Jas. P. Godrfey.

I WAS very hard up, and I was down in luck about geting a mount, so I said to myself I will try a job in a stable on some Ranch, and see what it's like. Having heard of a place in Sacramento, I went there. It turned out to be a thorough-bred stock ranch, which owned about 300 brood mares and about 14 or 15 stallions, and amongst them was the famous imported Salvator. I found the time-keeper, Johnson, who asked me, "Well, what do you want?"

"I want a job among horses, anything will do, and I can work well."

"All right; I want a man in the hospital stable, which is rather a bad job, as the horses are a bit wild, and you would have not only to clean the boxes, but bandage up the wounds, and watch the stable all the time, for horses that may be brought in sick."

"All right, I will do my best."

"That's right, my lad; you cannot do more than that; you can get to work tomorrow morning."

The next morning I went up to the stable at 5.30, and first thing cleaned and bandaged up the wounds, etc., of which there were a good many. I went to breakfast at 7 o'clock, and came back to work, and turned the horses out for the day in small paddocks made for the purpose, and had two or three hours' hard work cleaning the boxes and filling the racks with hay. I got finished at about 12 o'clock, and then went to dinner.

At 3 o'clock in the afternoon, I had to make a sort of mash of bran and oats mixed, of which I put half a pail into each of the mangers, and got finished about four o'clock, when I had to go and get the horses in again. I had then finished for the day, but had to stop round the place so that if a sick horse came in I could boss him or her up and get it settled for the night. At 6 o'clock I went down to the dining hall for supper. Such was my life for the first three months.

The second three months were the worst, as the bad weather was coming on. In America nearly all foals have an illness which is called "distemper," or "influenza," or "catarrhal fever," or "epizootic catarrh." They get a swelling in the throat, which, if it is external, is easy to cure, as you have only to lance the swellings when ripe, and wash out the matter inside. Internally, it is a different thing, as the horse has great difficulty in breathing, and you have a lot of work in getting poultices, etc., and then two chances to one that they do not recover. I had altogether forty-two boxes to clean out, and look after the inmates, and my wages were risen from 30 dollars to 45 dollars a month. I got up at 4.30 every morning, so as to get done cleaning, etc., by the time that the vet., a Dr. McCullum, came from Sacramento. After about a month I was cornered in a box by a vicious mare, who lashed out at me for some few minutes. She caught me only once, but it was a bad kick on the knee, and I had to ask for a man to come and help me. As more horses were being brought in every day, I got another stable in order, with the man who was helping me, and altogether there were 58 boxes to clean between the two of us. The man left, and I had to get another, who was a very lazy fellow, and did not do his work well.

I do not think that I have ever worked so hard in my life as I did there. I got tired of it, so after a bit I got a man to change jobs with me on the ranch for a week, so as to give me a spell. When I got back again there were 17 colts and fillies well, so that I was able to do without the extra stable. But I could not stand the work continually, so after finishing the month out I left, and had a holiday, and then went back to the ranch, herding the horses on the prairie, or what there is of it left. When I left I was bitten with war fever, and so came out to South Africa, where I had a good spell for a time at the front.

The Natal Creamery.

ANNUAL MEETING AT MOOI RIVER.

PROPOSED NEW SCHEME.

There was, says the "Times of Natal," a very good attendance of shareholders in the Natal Creamery present at the third annual meeting, held at Mooi River on the 8th inst. Among those present were:—Messrs. J. W. Moor, C. B. Greene, C. B. Addison, W. McFie, T. Hyslop, T. Russell, J. Bartholomew, B. Hutchinson, J. W. Johnson, H. Hodson, — Nourse, A. Lawrence, J. M. Pickering, H. Blaker, H. Ryle Shaw, G. R Richards, Dr J. B. Brewitt, W. E. Oates, J. H. K. Miller, E. O. Challis, F. Stanley, W. G. Lund, W. Teasdale, T. B. Griffin, James Siddons, C. B. Lloyd, B. Westall, and G. D. Alexander.

In the report, the directors were pleased to record a large increase in the volume of business done during the year. The total quantity of milk purchased was 170,992 gallons, representing an increase over the previous year of 81,841 gallons. The quantity of butter purchased was 62,155lbs., an increase of 39,633lbs. These figures indicated that the reputation previously achieved by the quality of their produe had been more than maintained. The directors reported that the new plant which should have been running was, owing to the difficulties and delay of shipping and transport, not yet completed. It was largely due to this delay and consequent losses that the directors refrained from recommending the payment of a bonus to suppliers. The Durban business of the company had been discontinued, the agreement entered into with the Model Dairy Company having been cancelled by mutual consent after running about four months. During December, the managing director retired, and Mr. E. Cauthcrley was appointed to the management of the company. The directors again recommended the full dividend of 7 per cent. Mention was also made of the purchase of a piece of land in a central part of Maritzburg, and this part of the report was considerably discussed during the meeting.

In proposing the adoption of the report, the Chairman said he was pleased to see the number of shareholders attending that meeting. It was gratifying to those who were trying to put the affairs of the company on a sound footing. They had seen by the report the increase in the Creamery's business during the past year. It showed that more than double the amount of milk had been handled than in the previous year, and nearly treble the quantity of butter. That, he thought, showed the want of creameries in the Colony. The directors had hoped that long before this time the new plant would have been in use. But as in other new industries, there was always this difficulty of getting machinery. However, it was here now, and the erection of it almost finished. He felt quite sure from what had been said by those who had worked with similar plants, that it would give every satisfaction. They could understand that not having large plant had hampered them in their business. They could have done more had they had it. Yet he considered the business for the year satisfactory. He thought that the directors felt that they were working not so much for a large profit as to be of use to a large body of farmers in the Colony. (Hear hear.) In working as they had been doing, they were, he thought, keeping in touch with the feeling of the shareholders, and that was for a large turn-over rather than big profits. Their liabilities had increased, being something like £7,000 more than last year. This had come about by an increase of capital and the purchase of a piece of land in Maritzburg for over £2,000. The liabilities incurred were, however, well worth the money as represented in the balance sheet. Some of the money had been put into machinery of the best type, and the money paid for the Maritzburg property had, he believed, been well spent. He had been told that were the company so disposed, they could now sell it at a profit. They would notice that a good deal had been written off for depreciation of plant and property. He believed that to be a sound policy. The directors thought it right to write off a good sum so that in case the company at any time wanted to sell their property they knew where they stood. The profit, after allowing for depreciation, had been for the twelve months about £900, and though it was not quite so large as last year, it was still satisfactory, and the directors considered it quite safe to declare the full dividend of 7 per cent. (Hear, hear.) They would, with the consent of the shareholders, place 10 per cent. of the profit, about £90, to the reserve fund, thus making it £170. He hoped in the future he would find it easier to get money. They wanted the public to feel they were putting their money into a safe venture, and he hoped that small investors would come in.

Mr. Moor then just touched a subject which it was evident the meeting wanted to hear something about. This was concerning the Maritzburg property. It was the wish of the directors, he said, to do something with that property. They thought of putting a building upon it. They had drawn up a rough scheme, but they thought it better to leave any details of it until after that meeting, as they did not think it right to tie the hands

of the incoming directors with any increased expenditure.

The Chairman then moved the adoption of the report, and this was seconded by Mr. P. D. Simmons, but some discussion followed.

Mr. Alexander asked if the £4,980 4s. 2d., put down as the value of the plant, included the new machinery, and whether the £510 8s. written off for depreciation, included anything for depreciation off the value of the new machinery.

The Chairman replied that the new plant was included in the £4,980 4s. 2d., but that nothing had been written off for depreciation, as it had not been used. Twenty per cent. had been written off the old machinery.

Mr. Alexander said he noticed also that in their can account only 3 per cent. had been written off, and he thought that insufficient. He further asked whether it would not be more satisfactory if the total amount of milk and butter purchased and that sold were put one against the other. Why he asked was, he understood that a large amount had been paid for a contract at Howick. Was that so?

The Chairman replied that a certain sum was paid for the contract.

Mr. Alexander: Was it £1,000?

The Chairman: No, it was not.

Mr. Alexander: Where does that appear on the balance sheet?

The Chairman: It does not appear.

Mr. Hyslop asked if the amount was included in the £1,132 13s. 2d., working expenses.

The Chairman replied that he was pleased Mr. Hyslop had put that question. It enabled him to explain that £700 had gone to the N.G.R. and another £400 in stores, gas and other things constantly required.

Mr. Hyslop then asked what the directors intended to do with the surplus profit this year. The articles of association said that the dividend paid to shareholders must not exceed 7 per cent., and after that had been paid the money was to be divided among the suppliers.

The Chairman answered that the articles of association said the suplus should be distributed at the discretion of the company. The reason for not distributing the money now was a proposed development. The company was started with insufficient capital, and the directors had to formally guarantee an overdraft at the bank of £3,000.

Mr. Hyslop said he could see by the statement before them that they were not able to pay a bonus for the past year, but at some future time they might be able to do so. Was the money to be ear-marked in any way, so that when things were better the money could be divided among the people it really belonged to?

The Chairman remarked that the directors had had no intention of dealing with the money in that way. Though the money was not now actually in the pockets of the suppliers, it was benefiting the company, which enabled them to sell their produce.

Another item in the accounts was then mentioned by Mr. Hyslop—"bone dust account, £8 11s. 5d.—which stood on the credit side.

The Chairman told the meeting how it had come about. Some of their customers, when manure was difficult to obtain, had come to them, and asked whether they would buy bone dust for them, thinking that the Creamery would have means of getting it cheaper. Therefore, the company acted as a sort of agents, and they had made a small profit. He was unable to say if the new directors would continue the agency.

With regard to the proposed buildings in Maritzburg, had the directors, Mr. Hyslop asked, any idea of the amount they would cost?

The Chairman replied that there was no fixed idea. The scheme was a rough and crude one, but he might say that if the buildings the directors had in view succeeded they would cost a lot of money.

Mr. Hyslop remarked that if they were going to put up buildings proportionate to the value of the land, it seemed to him that it was a question for the meeting as to where the money was to come from.

The Chairman said they had still a reserve of £3,000 to call up. If the shareholders wished it, they would call an extraordinary meeting when the new board had been elected. The site, he might tell them, was on property owned by the late Mr. Runciman, near the Public Library. There was to be a roadway through from Scott's Theatre to Longmarket-street, and the site was near the Victoria Club, and the place where the new Post Offices would be, and he thought a good building should be put up.

Mr. Richards thought the directors might take the meeting into their confidence, and, the other directors not objecting, went on to explain the scheme. There was a feeling, he said, that they started three years ago in too small a way. They had to be continually going to the shareholders for more money. If they were to go on, they must open up in a style that would not necessitate their always coming to the shareholders for money. To a very large extent they now depended on the military for their business. That might soon go, and they must look round for other openings. They had a splendid opportunity. With a turnover of 500 gallons per day, they could afford to invest £25,000 to £30,000. In Maritzburg they had a splendid stand—one of the best, he thought, that could be obtained for their business. It was near the Club, the new Post Offices, and within 500 yards of the Houses of Parliament. The first idea was to erect a dairy, with cold storage below. But their experience in Durban had taught them that they must have refreshment rooms as well. With these they would want lavatories and ladies' waiting rooms. Then, bearing in mind the cold

storage, it was found that they could run a fish and also a fruit shop. Then, to complete the scheme, they thought of adding another storey to let as bachelors' chambers. Afterwards the directors thought of abandoning the idea of the refreshment rooms, but to let that portion of the concern to another man. The bedrooms upstairs would feed that. If the Creamery did not go to Maritzburg, then they must understand others would.

Mr. Alexander: How could the bedrooms feed the shop? It seems to me the refreshment rooms would feed them.

Mr. Richards: No; I think they would feed the lodgers.

Mr. Hyslop: Do the directors think we are competent to carry on this business?

The Chairman retorted that if the farmers of the country had not sufficient confidence in their directors and themselves to do the business, other men would. (Hear, hear.) The same thing was done all the world over, and it ought to be done in Natal.

Mr. Hyslop remarked that it was not the fish or fruit shop, or even the bone dust, that he took exception to; but when the directors started boradinghouse-keeping, he thought they were going a little too far.

Mr. Greene pointed out that the whole thing was as yet only a suggestion.

Mr. Blaker was of the opinion that the company could not stand still. If they stood still, they went back. (Laughter.) He thought they ought to go to the big towns. They had the grazing, and it simply wanted the farmers to put their shoulders to the wheel, and pull out the cash. (Laughter.) If they did not begin, others would.

Mr. Johnson asked if the directors knew definitely whether Mr. Baynes intended to put up a building such as had been described in Maritzburg.

A Shareholder: What about it if he does?

Some questions as to the Durban business cropped up, and the Chairman said they opened in the winter when things were dear, and they had other disadvantages, yet they managed.

Mr. H. R. Shaw asked, in connection with the Maritzburg scheme, how it was proposed to distribute the milk.

The Chairman replied that he presumed the company would own horses and carts to distribute the milk at people's homes, and some people would go to the dairy and fetch it.

Mr. H. R. Shaw wanted to know if a number of agencies would not do better. He thought it would be a tremendous strain on the directorate if the company had to own horses and carts, etc.

Mr. Richards remarked that it had been the experience so far that the more agencies they had the more the expense.

Mr. Alexander said they had not told the probable cost of this building.

The Chairman replied that it might cost anything between £3,000 up to £150,000. It was impossible to say until some definite scheme had been decided upon. The directors had no wish to hide anything from the shareholders.

In reply to Mr. Russell, the Chairman said there was a small profit from the Durban business, and the partnership was dissolved by mutual arrangement. The directorate thought it to the company's advantage to do so.

Mr. Alexander said he must, in fairness to the Model Dairy Company, say that the reason the partnership was dissolved was that the Creamery's plant was insufficient to do the business. The milk arrived in Durban in bad condition. Mr. Baynes had wished that the Model Dairy could work together with the Creamery.

Mr. Greene said it was not quite as Mr. Alexander stated. In the Durban concern there really was four businesses, making it unworkable, but in Maritzburg there would be only one.

Mr. Richards said Mr. Alexander had suggested that the Creamery injured the Model Dairy Company's business. He had letters from people on the Berea, after the partnership had been dissolved, begging the Creamery to start in Durban on their own account, as they could not get decent milk.

Mr. Alexander thought those letters should be placed before the meeting.

A Voice: You ought to withdraw your remark.

The report and balance sheet were then approved of.

Next came the election of officials, and, after a ballot, the following gentlemen were elected to the Board:—Messrs. Hyslop, Moor, Greene, Russell, and Blaker. Messrs. Richards and Laurence, two retiring directors, did not seek re-election.

On the proposition of Mr. Richards, Messrs. Duff and Eadie were appointed auditors. It was decided to grant £15 as remuneration to Mr. W. J. O'Brien for acting as auditor last year.

Under the heading of general business, the discussion once more turned on the Maritzburg scheme. The Chairman took the meeting a little more into his confidence, and said if they really would like to see them he could show them rough plans of the kind of building they proposed to erect. The plans showed a two-storeyed building, with a fine frontage on to Longmarket-street, where would be two shops, and another frontage on to the new road, where would be two other shops.

Mr. Richards urged upon the meeting that the time to carry out the scheme was now. Don't let them say they were too poor. They could all afford it, and if that company did not do it somebody else would.

Dealing with the same scheme later on in the meeting, the Chairman said it would be a pity if by any catch vote a meeting of shareholders were to destroy the whole

scheme. He had, therefore, gone to the trouble with Mr. Richards of riding round to farmers to explain the thing. He found they all wanted to keep the concern in the Creamery, and he could tell them that there were plenty willing, did not the company do so, to take the thing over as a private concern. Five thousand pounds had been promised should the latter occur.

Mr. Richards then moved that it be an instruction to the new Board that they call up the necessary capital to push forward a scheme on the lines suggested.

In reply to Mr. Bartholemew, the Chairman said that the old Board thought that, with the issuing of the reserve capital, the scheme could be carried out. The balance would, of course, have to be financed. The estimated cost of the building would be £15 000, making, with the price of the land, a total of £18,000. And when they knew what they did about contractors, they need not be surprised if the building cost £20,000.

Mr. Alexander asked if the interest would still be 7 per cent., and the surplus profits still go the suppliers.

The Chairman: Yes; but the articles of association could be amended.

The motion, which was seconded by Mr. Blaker, was carried.

Mr. Lloyd now proposed, and Dr. Brewitt seconded, that the directors be granted £1 1s. a meeting for their services last year. This was agreed to.

Mr. Hyslop said before they parted he thought the meeting should tender its hearty thanks to Mr. Richards for his services in the interests of the Creamery.

Mr. Richards replied that he had spent, while managing director of the company, two of the happiest years of his life, and he asked for nothing more than what he had seen that day.

With the usual vote of thanks to the Chairman, the meeting closed.

Veterinary Departmental Report for January, 1902.

ABSTRACTS FROM REPORTS.

MINISTER OF AGRICULTURE—

Sir,—I beg to forward my monthly report for January.

Lungsickness.—This disease is still prevalent in Klip River County and in Zululand. Twenty-three fresh outbreaks have occurred in each of these districts. In the rest of Natal eight fresh cases are reported, two of which have unfortunately been imported from Australia. I refer to Mr. Baynes' cattle, and the Government heifers in the Veterinary Compound, Durban. Upon arrival, these animals showed no suspicious signs of disease, and were, of course, permitted to land. It will be understood that to insure against the introduction of lungsickness at the Port (or other such diseases with a long incubation period), a system of quarantining all animals arriving would have to be adopted. It is probable, however, that the disadvantage of such a system (interference with trade, expense to importers, etc.), would outweigh the advantages, and it would be an almost useless measure while diseased stock still continues to be introduced over our inland borders. One can place no reliance on death returns of animals dying on voyage in most cases; and frequently the cause of death is decided without post mortem examination.

Scab.—Five fresh cases have occurred in Klip River County; the disease now appears on the decrease here, and the movements of loot sheep appear to have stopped. Several large flocks have been removed from the district by the Cold Storage Company.

Zululand is now free from this disease.

In the rest of Natal, eight fresh cases are reported, five of which are in the Ixopo District (Sub-Inspector Hancock).

Sheep owners should now make an effort to clean their flocks before winter sets in, as the scab insect has a much better time and chance of spreading when the sheep lose condition, strength, etc., in the winter months, chiefly from the fact that the natural fat of the sheep's wool is not so plentiful or is wanting during this period. The fat retards the spread of the scab insect in destroying many of them by suffocation, etc.

Rinderpest.—This disease has spread slowly during the month. Four fresh

eases have occurred in the Ladysmith district, four in the Newcastle and Dundee districts, and one in the Krantzkop.

No fresh outbreaks have been reported from Zululand.

At the end of the month a fresh case appeared on the farm Earthcote, Upper Tugela Division, among discharged oxen sent from Newcastle. Prior to this the district had been free from rinderpest since December 14th. Weekly reports have been sent in on this disease.

From D.V.S. Power's report it will be seen that the serum of cattle salting four years ago still retains its antitoxic properties, i.e., the serum from cattle that were known to have been good serum cattle during the last outbreak. It does not follow that because an animal has salted, his serum is highly antitoxic in every case, even after heavy fortifying with virulent blood; with the serum from some animals which are known to have salted, and which have been highly fortified, one may experience heavy mortality; while with the serum from others used under exactly similar conditions, 90 to 99 per cent. may be salted. Such serum cattle which have proved themselves good are valuable; the proving, however, in some cases is expensive. The demand for bile still continues, owners still preferring to purchase rather than to send in cattle to a Bile Station. This is not assisting the Government in the matter, as it has now become most difficult to purchase cattle at reasonable prices for bile purposes. No one appears to fear the disease sufficiently to be anxious to sell out. The use of glycerinated bile is responsible to a large extent for the slow progress of the disease, and it is hoped that owners will not use raw bile, at least for the first inoculation. Some of the present outbreaks are due to the use of raw bile.

Glanders.—Three cases of this disease have occurred during the month.

Horsesickness.—Fourteen cases of this disease are reported throughout the Colony (civilian horses), five being in Zululand.

Mange in Horses is very prevalent, and will become more serious as winter appears. Where this disease exists in a troop of animals, the treatment of each individual case is not practical. Dipping (or spraying) will have to be resorted to. Much of my time during the month has been occupied on rinderpest duty.

S. B. Woollatt,
P.V. Surgeon.

P.V.S. Office, Maritzburg.

MOOI RIVER.—D.V.S. VERNEY.

Scab.—Except for the Estcourt Division, the other Divisions are almost free from this disease.

Lungsickness.—I regret to say that an outbreak of this disease has occurred among cattle belonging to Mr. Harding, Highlands. The affected animal was a trek ox that had been working locally. Where this animal contracted the disease is not known.

Glanders.—I discovered another bad case of this disease at Mr. N. Varty's, Stagstones. Fortunately this horse had not been stabled, so I hope now this animal has been destroyed that the disease will not spread further. I inoculated all the stabled horses with mallein, but none reacted. The animals running with this affected one are young and unbroken. These I have quarantined; I shall re-inspect them at a future date.

Redwater.—I saw a very bad case of this disease in a bull imported from the Cape Colony. The bull was in a moribund condition when I reached him.

During this month I have had no less than three cases of venereal disease in bulls, two of them being imported animals. This disease is quite common in England, but hitherto I have hardly seen it before in South Africa.

Quarter Evil.—In the month of December I inoculated 100 cases for Mr. A. Henderson. I regret to say that three of these animals died of the disease this month. I did not see these animals personally, but Mr. Henderson is certain of the cause of death, being thoroughly conversant with this fatal disease.

Biliary Fever.—An imported thoroughbred contracted this disease, and I am glad to say he has made a complete recovery.

NEWCASTLE.—D.V.S. HUTCHINSON.

Lungsickness.—During the month four outbreaks have been reported at Umsinga, ten at Dundee, and three at Newcastle.

Scab.—One outbreak reported in the Umsinga Division.

Rinderpest.—This disease is the subject of a special weekly report, in which particulars of the different outbreaks are given. So far, the mortality has been small, except in a few cases where the disease has forestalled inoculation. Glycerinated bile has given every satisfaction in all cases where it has been used up to the present. The use of raw bile has been the means of causing several herds to break out; in fact, in the Normandein area, where approximately 2,000 head of cattle have been inoculated with it, the disease in almost every instance made its appearance from five to ten days later among the different herds.

The losses within the area have not been heavy, except in the case of the first outbreak, as immediately the disease made its appearance after the first inoculation, the animals were re-inoculated, which generally had the effect of controlling the outbreak. Several herds have been treated with serum, with very satisfactory results.

Mange.—A most persistent form of this disease is affecting a large number of horses in my district, many of the cases proving most obstinate to the regulation treatment with the different dips, sulphur, etc., and only give way before very drastic measures.

I find washing the cases well with a solution of perchloride of mercury (1 to 800) two or three times a week alternately with dressings of carbolic oil or creosote and oil, effectively rubbed into the skin, to be an excellent remedy.

If emollients are not used, the skin soon becomes thickened, cracked, and unsightly.

LADYSMITH.—D.V.S. POWER.

I am glad to be able to report that Rinderpest has not made much progress during the month, there being only four fresh outbreaks, all amongst native cattle on the farms Doornkraal, Swaartkloof, Kleinfontein, and Vlaak Plaats. On Kleinfontein the disease broke out amongst a herd of seventeen native cattle; the owner did not trouble to report it. However, he was not troubled with it for long, as nearly all his cattle were under four years old, and in a very short time all that he had left were two old cows that had come safely through the last outbreak. Proceedings are being taken against this native for not reporting the outbreak.

There is still a great demand for bile, though I think that most of the people in the district have now inoculated, and nearly all with glycerinated bile, and I am glad to say I have not had a single complaint about the bile issued. As you are aware of the serum experiments carried out for Mr. J. W. Mackenzie and Messrs. Caldwell Bros., Dundee, I shall only refer to them briefly. One lot of sixty head, belonging to the first named gentlemen, were infected with virulent blood and treated with the serum from old "salted cattle." All took the disease, and in no case did it prove fatal. I treated forty head in the same manner for Messrs. Caldwell Bros. and five died from Rinderpest.

I may mention that in Mr. Mackenzie's case he knew the history of his "salted" cattle, having used them during the '97 outbreak, whereas Messrs. Caldwell Bros. did not, and I think this explains the number of deaths amongst Messrs. Caldwell's as compared with those treated from Mr. Mackenzie's old and tried servants.

Another herd of 300, belonging to Mr. Mackenzie, are now being treated in the same manner, i.e., with the serum from old salted cattle.

I consider the results of these experiments prove that the serum taken from cattle that "salted" during the outbreak four years ago is quite reliable now.

Lungsickness.—The disease is still prevalent, and is likely to be the case while the present conditions exist.

P.S.—It has just been reported to me that Rinderpest has broken out at Upper Tugela again, caused by the return

of some discharged military oxen. The last death from Rinderpest at Upper Tugela (Sand Spruit) occurred on December 14th, 1901. If this sort of thing goes on I do not see any prospect of checking the spread of the disease.

ZULULAND.—D.V.S. PALGRAVE.

Horsesickness.—Only five deaths from horsesickness have been reported throughout the Province since 7th January, namely, one in Hlabisa district, one in Melmoth district, and three in Eshowe district.

Rinderpest.—Nkandhla District.—The disease in this district is still confined to the near neighbourhood of the original outbreaks in the wards of Matshana and Luzindela. The total number of deaths since the disease first appeared in the district up to date is 54; of these, three cattle, which had just recovered from lungsickness, and were in poor condition, died almost immediately after inoculation. During January, 126 head of cattle were inoculated.

Transvaal.—The disease has appeared at some native kraals in the Transvaal at a short distance from the Nkandhla border, and up to date eleven deaths have been reported and 28 head of cattle reported sick. Endeavours have been made to have these cattle inoculated in order to prevent the disease spreading along the Nkandhla border, but the difficulties of carrying out these inoculations is very great, owing to the constant presence of small parties of Boers.

The order issued by the military authorities, that all cattle are to be brought inland from the border, is almost certain to result in the spread of the disease.

All the other districts of the Province are still free from Rinderpest.

DURBAN.—D.V.S. AMOS.

The importations to Natal through this month have been numerous, as the figures below will show:—

Horses, 9,813; mules, 2,021; sheep, 1,550; oxen, 1,645; dogs, 14; cows, 3; calves, 1.

The horses are composed as follows:—Australian, 3,976; American, 3,035; Russian, 2,246; English, 556.

The mules all came from America; of the oxen, 1,520 came from Madagascar and 125 from Australia.

The 1,550 sheep were all Australian, as also were the three cows and one calf. The three cows were tested here for tuberculosis, and one, ex S.S. "Argus," reacted and was destroyed. I made a post mortem examination, and well marked lesions were found and forwarded to the Government Bacteriologist.

Glanders.—One case was reported as destroyed during the voyage of the S.S. "Monteagle," from Fiume. The shipment were inoculated on arrival without any reactions occurring. All other shipments arrived clear from this disease. No cases have come to my notice in the town, and the stable in Union Street which I condemned is being rebuilt.

Skin Diseases, chiefly mange and ring-worm, were very bad on some of the shipments arriving here. These cases were most stringently isolated and treated by the Veterinary Officers in charge of Remounts, Durban.

Lungsickness has broken out amongst the Government heifers in quarantine here, and up to the present five deaths have occurred (four being killed for lungsickness and one for anaemia) for which see special reports. At the present moment all the heifers are improved in condition, and none show any suspicious symptoms of disease, with the exception of one which is coughing, and has been isolated for several days.

All the Government heifers have been inoculated and drenched with lungsickness virus.

Scab.—I had to stop the landing of 50 sheep badly affected with this disease from the S.S. "Milwaukee." All the oxen arriving were landed for slaughter purposes only, certificates for which have been put up in this office.

A deposition has been made against ——— for landing oxen without my previous examination. Luckily this was detected at an early stage of off-loading, and in consequence every animal was carefully examined by me before they left the Point. Such practices as these, how-

ever, cannot be allowed to take place, and can only be stopped by bringing the defaulters to Court.

Locusts Acts.

ACT No. 42, 1901, should have been included when publishing the Locusts Acts in the last issue.

In order to clearly show the effect of the Amending Act of 1901, Act No. 30, 1898, is republished minus its repealed clauses, and read in conjunction with Act No. 42, 1901, should meet the case of those wishing to bring pressure to bear upon their neighbours—whether coloured or otherwise—who refuse to take part in locust destruction.

ACT No. 30, 1898.

To extend the provisions of Act No. 33, 1895, entituled an 'Act to provide for the Extermination of Locusts.'"

BE IT ENACTED by the Queen's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Legislative Assembly of Natal, as follows:—

1. This Act and Ac No.33,1895, shall be read and construed together as one Act.

2. [Repealed by Act No. 42, 1901.]

3. Where any farm is infested by locusts at that stage of their growth when they are as yet unable to fly, the owner or occupier of any adjoining farm may, by notice in writing, call upon the owner or occupier of the first-mentioned farm to destroy the said locusts, and the latter shall, if called upon to do so, assist, both by himself and by his servants, in effecting their destruction.

4. Where any person requested to destroy the locusts upon his farm shall neglect or refuse to do so, the person who requested him shall be at liberty to enter upon the farm, together with his servants, for the purpose of destroying the locusts, and while so engaged neither he nor his servants shall be deemed to be trespassers.

5. Any expense incurred in destroying locusts after notice given in the manner hereinbefore provided shall be borne in equal proportions by both parties, whether the locusts shall have been destroyed by both parties jointly, or by one or other of them, and the party by whom the expenses may have been paid shall have a right of action against the other party for his proportionate share of such expenses.

6. [Repealed by Act No. 42, 1901.]

7. [Repealed by Act, No. 42 1901.]

Given at Government House, Natal, this Fifteenth day of August, 1898.

By command of His Excellency the Governor,

HENRY BALE,
Attorney-General.

ACT No. 42, 1901.

"To extend the operation of the Law relating to the destruction of Locusts."

BE IT ENACTED by the King's Most Excellent Majesty, by and with the advice and consent of the Legislative Council and Legislative Assembly of Natal, as follows:—

1. Sections 2, 6, and 7 of Act No. 30, 1898, are hereby repealed.

2. The provisions of Act No 30, 1898, as amended by this Act, shall extend to the whole Colony.

3. The word "farm," as used in Act No. 30, 1898, shall mean any rural property, inclusive of Crown Lands and lands of the Natal Native Trust.

4. The notice provided for by Section 3 of Act No. 30, 1898, shall, in the case of Crown Lands or lands belonging to the Natal Native Trust, be given to the Magistrate of the Division at least ten days in advance.

5. In the case of Crown Lands, the proper proportion of the expenses referred to in Section 5 of Act No. 30, 1898, shall be borne by the general revenue, and in the case of lands belonging to the Natal Native Trust, it shall be borne by the Natal Native Trust.

Given at Government House, Natal, this Twenty-sixth day of August 1901.

By command of His Excellency the Governor,

CHARLES J. SMYTHE,
Colonial Secretary.

The Shorthorn Society is moving with the times. The principle of registering prefixes and affixes, which has worked so well in horse-breeding, will be adopted by Shorthorn breederse It will be the breeder's sign-manual on his stock.

The Agricultural Journal

AND MINING RECORD.

VOL. IV. FRIDAY, FEBRUARY 28, 1902. No. 26.

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CONTENTS.

The present Volume, No. IV., ends with this Issue. Those desirious of having their back Numbers bound, should them to the Publishers, The Times Publishing Co., Maritzburg, whose contract price for binding in cloth is 4s.

Mange in Horses.

NOTICE.

WITH a view to suppressing the disease Mange in horses and in goats, it is hereby notified, for general information, that this disease from date will be brought under the provisions of the Act for preventing the spread of Contagious and Infectious Diseases among Animals (Act No. 38, of 1894).

Persons having in their possession or under their charge any animal or animals affected with this disease must isolate such, and at once report the case to an Officer of the Veterinary Department. Any animal or animals affected with the disease are prohibited from being driven along or upon public roads or exposed for sale by public auction.

S. B. WOOLLATT,
Principal Veterinary Surgeon.

Principal Veterinary Surgeon's Office,
Pietermaritzburg, 22nd February, 1902.

Bile Supply.

NOTICE.

UNDER Government Notice No. 506, of 1901, I hereby grant permission to all owners having cattle in the Magisterial Division of Umsinga to inoculate their cattle with glycerinated bile. Raw bile may be used for the second inoculation should the owner so wish. A Bile Station exists at Besters, and one is now being established at Dundee. Owners should send in to a Bile Station 5 per cent. of their cattle, between 3 and 4 years old, when sufficient bile for a double inoculation of their cattle will be issued to them, and they will be refunded in cash half the value of the cattle so sent in at a price not exceeding £10 per head. A charge of 3s. per dose is made by the Government in cases where bile is purchased for cash and the necessary percentage of cattle not sent in, but the Veterinary Department cannot guarantee a supply. Owners should send in the percentage of cattle in order to make certain of obtaining the amount of bile required by them.

A charge of 2s. 6d. per dose is made for serum.

S. B. WOOLLATT,
Principal Veterinary Surgeon.

Principal Veterinary Surgeon's Office,
Pietermaritzburg, 22nd February, 1902.

Disposal of Farm Produce.

THE Minister of Agriculture has called the attention of the Military Authorities to the fact that there are large quantities of mealies, forage, and potatoes, which have been grown in the Colony this season, and which are at their disposal. The Minister suggests that those having produce of this nature for sale, should send particulars as to prices and quantities on hand to the A.A.G for Supplies at Newcastle.

Mapstone Oats: Another Report.

MR. J. HAYES, Polela, writes:—I received 14 lbs. of seed from Mr. Brown, Secretary of Polela Agricultural Society, and planted the seed on the 24th of August, 1901, and I must say I got a splendid crop. I reaped 576 bundles, and I found the crop quite rust-proof. On thrashing I got seven sacks of seed, each sack weighing about 160 lbs., the whole amount weighing 1,120 lbs. The only fault I see is that you cannot replant after reaping, as the seed is too new, and will not germinate. The seed is not like the Sidonian, which you can reap and immediately replant with success.

Jarrah Wood Seed.

THE Department has a small quantity of the Jarrah wood seed for distribution. The Jarrah timber of Western Australia has acquired high reputation for durability, and is recognised as particularly suitable for railway sleepers.

District Reports.

INGWAVUMA, 6th February.—The weather has been excessively hot, especially during the early part of the month. The highest temperature, 95, was registered on the 4th, and the lowest, 51, on the 18th. Heavy rains fell during the latter part. The total rainfall was 7.15 inches; the heaviest—2 inches—fell on the 26th. All the rivers in the district were in flood, and some of them, for many days, were quite impassable. In consequence of the favourable weather experienced, the native crops are all that can be desired, and there is now no longer any probability of a shortfall of food this season. Large swarms of hoppers are reported to have hatched in the low country during December, and are now slowly making their way up the mountain. Up to the present very little damage has been done by them to crops. An unusual quantity of rats have made their appearance on the mountain this summer. In fact they are now so numerous as to almost amount to a plague, and it is quite unsafe to leave any wearing apparel, &c, within reach of these destructive rodents. One native chief has reported that his growing crops—principally mealies—are being destroyed by them. All stock continue to thrive, and no outbreaks of any disease amongst them have been reported during the month.

R. COLENBRANDER,
Magistrate.

VERULAM, 20th February.— Agricultural matters have been progressing in a normal and satisfactory manner since I last wrote, and all cereals are reaching the last stage of their development The later mealies are looking better than those put in early in the summer, but taken all round, they and tobacco are not looking so well as last summer. There will, however, be a heavy crop of both above the average. Some of the sugar mills have stopped crushing for this season, and their owners are busy with the weeds, and tidying up for the winter season. Doubtless before commencing next season's crushing they will have had their boilers tested in terms of the new Act, establishing the inspection of boilers in the Colony, which is now in force. There are a considerable number of small boilers now working in this district brickmaking, which should undergo the same test as soon as possible. This merely by the way. The cane fields are looking grand, and the young plant cane is coming on in fine style. The output of sugar for this Division for the year 1901 is returned at 12,561 tons, which, I believe, is the highest for several years. The following are a few of the meteorological observations made here during January:—Maximum temperature in the shade, 100 degrees on the 16th. Minimum, 63 degrees on the 29th and 31st. Rainfall, 4 88 inches, which fell on 17 days. The heaviest fall was 2.38 inches on the 30th. The mean temperature for the month was 78.4 degrees. The rainfall was below the average, but being fairly well distributed, and accompanied by cool weather, the shortfall was not missed. This summer, so far, has been remarkable for its coolness. There have been a few hot days, but never any long spells of heat, and few hot nights. For these reasons, I understand, the health of the Division is excellent, there being no epidemics, and few ailments of any kind about. Locusts, too, have not proved the trouble that was expected. Considering the vast swarms which laid eggs throughout the Division, there are very few hoppers about; the eggs appear to have been rotted by the frequent rains and a maggot which got amongst them. I have not yet heard of any cases of horsesickness, which is remarkable for the coast at this season of the year. In fact, the Division is at present clear of disease of all kinds amongst stock. At present it is somewhat dry, no rain having fallen for a matter of ten days. So far no damage has resulted, but a continuance much longer might tell on the developing mealies, and lighten the crop. The present, and I hope, temporary, stoppage of rain is of course due to the heavy rains which have been falling in the Western Province of the Cape Colony. These untimely rains invariably draw the rain away from us here along the East Coast.

JOHN L. KNIGHT,
Magistrate.

Weekly Rinderpest Report.

25TH FEBRUARY, 1902.

Ladysmith Division.

KIRKINTULLOCH. — Fresh outbreak amongst natives' cattle. Three dead, five sick.

Swaartkloof, Doornkraal, Vlaakplaats, and Kleinfontein.—No deaths; no fresh cases.

Buy's Farm. — Military Cattle: No deaths; no fresh cases.

Buy's Farm.—Natives' Cattle: First outbreak; no deaths; no fresh cases.

Buy's Farm.—Natives' Cattle: Fresh outbreak; three dead; four sick.

Wachtenbeetjekop, Van Reenen's.—No deaths; no fresh cases.

Upper Tugela Division.

Earthcote.—No deaths; no fresh cases.

Newcastle Division.

Normandien Area.—One animal sick.

Ingogo and Charlestown.—One fresh case at Ingogo; cattle of Mr. Middleton.

Lennoxton Area. — Fresh outbreak; cattle of Mr. Greening. One dead.

Fresh outbreak.—Cattle of S. James. One dead.

Cattle of J. Smith's: four deaths. P.W. Department: One death.

Hope Farm.—Cattle of W. Adendorff: Sixteen deaths up to 23rd February, 1902. Natives' cattle: Fifty deaths up to 23rd February, 1902.

Eaglescliff.—Fresh outbreak: Cattle of A. Vanderplank, one dead.

Dundee Division.

Aviemore.—No deaths; no fresh cases.

Lincoln and Swiss Valley.—No deaths; no fresh cases.

Blesboklaagte.—Cattle of Cold Storage Company: 680 head. Up to 23rd inst: 156 dead; 46 sick. Cattle all inoculated with bile.

Sheepridge.—263 head, 19 dead, 2 sick. Cattle all inoculated with bile.

Zanana —Fresh outbreak amongst 320 head of cattle belonging to D. Meumann. One dead, eight sick.

Umsinga Division.

Native Location near Pomeroy.—Fresh outbreak amongst 18 head of cattle belonging to Chief Kula: Two dead, 16 sick. Cattle all inoculated with bile.

Krantzkop Division.

Quarantine Area:

Elandsvlei.—Four deaths; two fresh cases.

Elandskop.—No deaths; three fresh cases.

Zululand.

N'Kandhla.—No deaths; no fresh cases.

M. J. HIME,
For P. V. Surgeon.

Correspondence.

To the Editor Agricultural Journal.

VINE STOCKS AND BAMBOOS.

SIR,—Do you know, 1. If any nurseryman in Natal keeps vines grafted on phylloxera resistant stocks?

2. Where roots of bamboos, suitable for whip-sticks, are to be obtained? i.e., close-jointed bamboos, called Cape sticks, and used by post cart drivers.—Yours faithfully,

T. F. REMFREY.

Ixopo, 3rd February, 1902.

PHYLLOXERA RESISTANT STOCKS.—Mr. W. J. Bell, florist and seedsman, Maritzburg, keeps the vine stocks required by Mr. Remfrey. At present he is sold out, but in July next he expects another consignment. It is, of course, possible that other seedsmen import these stocks. The importation, however, is not common.

BAMBOO WHIP-STICKS.—With regard to this question, Mr. H. W. James, of Zwolle, Verulam, has been good enough to provide the following reply: upon the uses to which bamboos can be put, Mr. James gives much interesting and practical information in an Ergates' interview, No. 9, Vol. IV. Mr. James writes:—

I have your favour of the 5th inst. re bamboos and Cape whip-sticks. I think this latter kind is not the same as the common bamboo we have here, inasmuch as the joints are longer and the sticks much thinner and more like a reed than the common bamboo. Still, so great is the difference caused by climate, soil and elevation, that I am unable to arrive at an opinion. I have heard that there is a

South African species of bamboo which grows in the kloofs of the Drakensberg mountains, but have been unable to procure a plant, nor have I got the Cape kind. From the pages of the "British Trade Journal," I gather that in one of the northern parts of Japan large quantities of *black* as well as *mottled* varieties are sent to Europe and America, and used for chairs and ornamental furniture. From the account it appears that the bamboos are naturally black and mottled, and not coloured by the ingenious Japs. I have tried in vain to get these varieties. The Natal whip-stieks are simply our common bamboo, grown in very poor soil, as at Pinetown. Here, in our best soil this sort reaches 70 feet, with a diameter of 4½ to 5 inches. I have another sort here, a thorny kind, used in India for forts on the plains of Oude; it does well here, and reaches a height of 40 feet, has a very small hole, but is said not to be so good as the common kind for whip-stieks, fishing rods, etc.; but I have none ripe yet, so I cannot exactly say from personal knowledge. In addition, I have the dwarf and the yellow bamboo, the latter beautifully striped with bright green. This latter I think more ornamental than useful, but all straight wood is very valuable in this land of crooked sticks.

I find that the propagation of the bamboo is most easily effected by cuttings in the same manner as sugar cane. Make holes a foot deep and five to six feet long. Take a bamboo of full height and two years' growth, cut it into five feet lengths, and cut off the side branches at three inches from the stem, plant two in a hole, rows thirty feet apart, and holes about 15 to 20 feet. Plant after rains in October and November. Cover the plants six or eight inches.

P.S.—I once planted a cart load of roots; only two grew. Please note that the sett must be covered from the sun. I use wet sacks.

Abortion in Cattle.

"R," on the above subject writes to the *Live Stock Journal:* At the opening of a new year, and having to all appearance got rid of foot-and-mouth disease, may I appeal to the President of the Board of Agriculture to at least make an effort, which will have the merit of being the first attempt yet made, to rid the farmers of the United Kingdom of contagious abortion in our cattle, a disease which, more than any other, has been the means of limiting our national stock of cattle? Does it not seem strange that we should employ all our efforts, expend huge sums of money, in stamping out foreign diseases, yet go on year after year enduring and suffering a home disease which has lost us so many victims? In Mr. Hanbury we have, I feel assured, a Minister who is anxious to benefit British agriculture; if so, I trust he will avail himself of the earliest opportunity at the opening of Parliament to have contagious abortion in cattle scheduled under the Contagious Diseases (Animals) Act.

As one who has witnessed the ravages of this disease for a period of quite half a century, perhaps you will allow me to point out the salient facts. If the President will rid us of this drain upon British cattle, and upon British farmers' pecuniary resources—and there will be no great difficulty, no great cost, in the operation, his name will be handed down to posterity as one of the best friends to British tenant-farmers. I say tenant-farmers, because breeders can protect themselves from the scourge; the bulk of tenant farmers cannot do so.

There are two phases of abortion in cattle, just as there are in the human family. In both, the non-contagious may arise from various causes, accident, excitement, and is generally known as miscarriage. In the human, the contagious phase is known as puerperal fever, and after attending a case, both doctors and nurses have to refrain for a time from attending at another birth, so highly contagious and infectious is the disease. In

cattle this is exactly the condition of contagious abortion.

The disease must have been with us for centuries. Personally, I have known it for sixty years, and have heard of it from my father and grandfather; yet, strange to say, it is only some thirty years ago that the Government of the day recognised its infectious and contagious nature. There is no bovine disease that can be conveyed in so many different ways—by contact, and by the sense of smell, by human attendants, by wild animals, and in the hair of the infected animals. Once contracted by a single animal, and it rapidly runs its course through a herd of calving cows and heifer stock. During service it can be conveyed by a cow to the bull, and by the bull to every cow he serves.

The duration of the infection is put at three years, if no new infection is introduced; but herein lies the difficulty. A farmer has to keep up his milking stock; during an attack from 60 to 90 per cent. of his animals may abort, so that he is compelled to bring in new stock: he is completely in the dark as to whether these new cows or heifers are or are not from aborting herds, and I know farmers at the present day who have never been clear of the complaint for the past twenty years.

Let the mind dwell for a moment on the facts, for facts they indubitably are, as it needs no stretch of the imagination to grasp that the nation is the poorer every year by thousands of calves; and when this is extended back over centuries, the thousands become millions. Cattle plague, foot-and-mouth, and pleuro-pneumonia were with us but a short time, probably as many years as abortion has existed for a like number of centuries, hence the losses from these foreign diseases fall into insignificance when compared with the losses from contagious abortion.

It may naturally be asked, if these losses are so serious, and have been so long continued, why have the farmers of the United Kingdom not called upon the Government to introduce remedial legislation? Or, if they are apathetic, why have not the landowners and pedigree breeders moved in the matter?

As in the olden time, before notification of contagious disease in the human family became compulsory, some farmers who have abortion in their stock may try to hide it from their neighbours and the public, simply because the knowledge of its existence might prevent them selling their cattle. Each and every farmer hopes to escape a visitation; but he knows that he is helpless to guard against such.

The remedy would be simple and not costly. All that we need is to schedule the disease under the provisions of the Infectious Diseases (Animals) Acts. The disease is supposed to run its course in three years; for that time the farm (only) must be an infected area; the tenant can send out milk and other produce as usual; but he must not take on to it fresh cattle stock, unless guaranteed free from the disease, nor must he send out for sale any stock except for immediate slaughter. In the course of some five or six years, without any pecuniary sacrifice worth mentioning by the tenant farmers, the disease would die out for lack of fresh infection to feed the flame. Surely here is a grand chance for Mr. Hanbury.

On the Banks of the Nile.

MR. P. D. SIMMONS sends the accompanying verses. He thinks they are well suited to follow the American account of harnessing alligators.

On the banks of the Nile
A large crocodile
Waved his pipe at the westering sun;
He sat on a stile,
And rested his smile,
Because the day's work was done;
And his numerous snacks
Of Nubian blacks
Had only left room for one.

Then a naturalist
With a gun in his fist
Came over the sands with a yell,
For a crocodile skin
With a seven-yard grin
Was a thing he was anxious to sell.

But the vision of night
That greeted the sight
Of the moon that succeeded the sun,
Was a large crocodile
That sat on a stile,
A-picking his teeth with a gun!

—From "Chatterbox's Christmas Box."

The Prospects of Natural Indigo.

THE British Consul at Marscilles in his latest report discusses the methods to be adopted by indigo planters to meet the competition of the artificial product. He remarks, there is a way out. It will be found in improved cultivation, on scientific principles, of the plant, and in improved methods of extracting the natural dye from the indigo plant. Considerable initiative and some outlay of capital is required. The old mechanical method of hand-and-foot labour, as handed down from generation to generation, without any thought of improvement, will have to go. The process of extracting the maximum quantity of pure indigotine from the vats is being closely inquired into by experts, I am told. Authorities in chemistry will undoubtedly succeed in obtaining increased proportions of colouring matter from the plant, which has hitherto not been expected to give more than 1½ lbs. of indigo for 100 lbs. of the plant. At the present moment experiments are in progress in Cambodia, which will be of particular interest to indigo planters in British India. I am told that one Martinique planter has succeeded in obtaining a product containing 73 per cent. of pure indigotine at a cost of 1s. 1d. per lb. This is at a notably less cost than that of artificial indigo, as stated above. It is thus far from a certainty that natural indigo will disappear from the market as soon as madder did when threatened by German chemical competition. Indigo planters willing to radically alter their old-time methods, improve their cultivation of the crops and alter the mode of extraction of the dye, and who, by means of combination with official help, can make the necessary sacrifices that the changes will entail, may take heart of grace. The last word has not been said yet on the subject of natural indigo.—*Imperial Institute Journal.*

Lemons.

VERY few, says "Queensland Country Life," perhaps realise how very useful lemons are, not only for cookery, but in many other ways. Here are some of the things lemons are good for—first of all for toilet purposes, as they are not only healthful but beautifiers.

Pure lemon juice and water makes an excellent medicine, if taken in moderation, as it clears the skin and purifies the complexion. Chapped hands can be softened and whitened by applying lemon-juice; but it should not be used every day, as it tends to dry the skin. If applied to the face once or twice a week, it prevents wrinkles.

A few slices of lemon in the washhand ewer will soften and perfume the water.

Lemon-juice and magnesia, applied to the face and hands, will make the skin white and soft.

A teaspoonful of lemon-juice in warm water will make good tooth-wash, but the mouth must be thoroughly rinsed out after using. The same quantity of lemon-juice and water is an excellent remedy for stained finger-nails.

Lemon-juice is also good to cure unbroken chilblains with.

For headaches, a slice of lemon placed on the temples will give relief; while a cup of strong coffee, with a teaspoonful of lemon-juice in it, instead of milk, will cure a sick headache.

A glass of hot lemon and water taken the last thing at night before going to sleep, and as hot as possible, is a splendid remedy for a cold, as it induces a profound perspiration.

In cookery, every housewife knows the value of lemons, both juice and rind—as a squeeze of the former in most things

is an improvement when not required to be flavoured with it; fish especially being much improved in nearly all preparations with the addition of lemon juice, which can be frequently used instead of vinegar; indeed, it is far better to take and squeeze over oysters than vinegar. Whenever a slightly sharp flavour is required, use lemon-juice. Some apples, when stewed, are rather flavourless, but if cooked with a shred or two of lemon-rind, and some lemon-juice squeezed into them, they will be much improved.

Lemon-juice can be substituted for wine or brandy in cookery, such as sauces, cakes, etc., and the flavour will be very little different. In the case of cakes that are required to be kept, and brandy is given in the recipe, lemon-juice may be used in the proportion of one lemon for every wineglassful ordered.

Mincemeat is as good, and keeps as long, when made with lemon-juice as with brandy.

Rarey, the Horse Tamer.

RAREY, the famous horse-tamer, was originally an Ohio farmer. For years he lived in obscurity, teaching his system to anyone who would pay a few dollars and promise secrecy. He was "discovered" by a sharp American named Goodenough, who saw there was money to be made by horse-taming. Goodenough entered into partnership with Rarey, and the two began by exhibiting the Rarey system before General Sir Wm. Eyre's aide-de-camp, Sir William at that time being in command of the forces in Canada. After this the partners came to England, with letters of recommendation from Sir W. Eyre, and secured the active patronage of Sir Richard Airey, Lord Alfred Paget, and others. Messrs. Tattersall investigated the Rarey system of taming, and, convinced that it would prove invaluable, and do away with much cruelty and much work, they resolved to help Rarey in every way. A subscription list was opened for pupils at £10 10s. each, and on March 20th, 1858, Mr. Rarey gave his first lesson, having obtained 320 subscribers. It became the fashion to go to Rarey's classes, and in their first year in England the two partners made £20,000.

Rarey's success in taming Lord Dorchester's famous savage Cruiser was the means of stimulating public interest or curiosity. Cruiser was such an ill-tempered brute that John Day was glad to be rid of him. He could not be got out of the stable without endless trouble. On one occasion Day sent him to Rawcliffe in charge of a groom, whom he cautioned not to put the horse into a stable. The man ignored the caution, and when the man went into the inn for a drink he left the horse in the stable. The roof had to be pulled off before Cruiser could be secured and brought out again. He was always kept muzzled, and was shown by a groom armed with a bludgeon; and the Rawcliffe Stud Company returned him to Lord Dorchester on account of his vice, it being considered as much as a man's life was worth to attend on him. He had not been ridden for three years when he was brought to Rarey, and after three hours' work, first Mr. Rarey, and then Lord Dorchester mounted him. The following day Rarey led him from Greywell to London behind an open carriage.

Disposal of Adamshurst Stud Flock.

MR. ADAMS, so long one of our most successful breeders of Merinos, is disposing of the whole of his Pedigree Stock at the Howick Stock Fair on the 6th of March.

A good story is told of a recently dead old squatter who was accustumed to punctuate all his sentences with the exclamation, "What! What! What!" uttered in quick succession. His station was noted for its inhospitality towards the nomadic wanderers of the bush as they tramped in search of work from place to place. One of these, in revenge for being refused rations, one night put a fire-stick in the woolshed, and, at the same time, wrote on one of the huts: "Pop goes your shed! What! What! What!" On his attention being called to this, old Brown pulled a carpenter's pencil out of his pocket and scrawled underneath: "Insured up to the —— hilt, What! What! What!"

"SAMBO."

By "Hippias."

I NEED scarcely apologise to the readers of the *Agricultural Journal* for the heading of this article. If, in England, the march of intellect has eliminated the dog as a necessary part of the gunner's equipment; if, in the grand battue, the *bipes implumis*, with a stick in his hand, has taken the place of that equally intelligent and far more elegant quadruped, the Clumber Spaniel—if the watch dog is no longer needed to protect the homestead from assaults of lawless man or savage beast—here in Africa we have not yet arrived at that pitch of civilization that enables us to dispense with the dog; and I may be pardoned for expressing a hope that that time may never come.

Though the hyena no longer utters his nightly howl in Greyling Street, as he did when I kept house there in 1853, though jackals are no longer found on Foxhill, nor are the pumpkins in the Camp gardens devoured by porcupines—yet the country farmer would soon find himself at a loss if he missed the bay of his faithful hound in the yard at sunrise, and no warning were given him of the approach of strangers.

The farmer's dog keeps vermin of all sorts at a distance from sheep-fold and poultry-yards, guards the grazing sheep, and reclaims them when astray; and has his assured and necessary place, though not always recognized, in the inventory of farm stock. If this apology is not sufficient, I must let the article speak for itself.

As my English home was near the centre of my uncle's estate, which counted ten thousand acres, the reader may imagine that we were not too closely pressed by neighbours. It was a drive of from two to three miles to the nearest house, other than those of the curate, my uncle's steward, or the tenant farmers who lived in and about the village. Our nearest neighbours were the Veans, of Canon Court. The name is, of course, fictitious, as they were a large family, and some of the grandsons may possibly have served in this everlasting war, and might object to see their name in print. The father of the family was a short, stout built man, who had passed through Westminster (a rough school in those days) not without some reputation as a pugilist; and having held a commission in the Yeomanry, retained, among the common people, his title of Captain. He was a forward, and what we used to term a bruising rider to hounds, and was known to many as the Flying Captain. He had the sailor's trick of spinning yarns, too; some of which his enemies alleged to be beyond the allowed limits of embroidery; and they emphasized this opinion of eliding the first letter of the appellation, and giving it a rather opprobrious meaning.

His wife, who, though her actual height was, I believe, 5 feet 8 inches, looked a giantess by the side of her husband, was known throughout their side of the country as Long Charlotte. She was the mother of several daughters, handsome and dashing girls, who made the house a pleasant place for a visit. Vean's temper, which was not always under very rigid control, gave rise to stories told over the second glass of port, or at the covert's side, not always without a spice of exaggeration; one of these, for the truth of which I can personally answer, may be worth recording.

A hunted fox had been followed from Heythrop to Chadlington, and Vean who knew the country well, was in a good place, and meant to keep it; when, as he was making for a weak spot in a bullfinch, a man in a worn and dirty pink, on a boring horse, crossed him and took the fence so closely in front as to throw "Vivian" out of his stride, very nearly

giving his rider a nasty fall. Vean was boiling with rage, and, a slight check occurring, just enough to give the horses a blow, he rode up to the stranger, and, grasping his whip hard, exclaimed: "Do that again, and I'll horsewhip you!" At that instant a hound gave a whimper, and

"Hark to Wanton, cries Jack; and the rest were not slack,
For Wanton's no babbler, esteemed in our pack;
Little Bonnie and Collier came merrily in,
And every hound joined in the musical din:
Had Nimrod, the mightiest of hunters, been there,
He, gad, he'd have shook like an aspen from fear!"

There was a rush for the next fence, and they were off again full cry; but after a big ring, over Ascotfield, skirting Shipton and Lyneham, and through the Norrells' back to Sausler Pillars—the old entrance to the old Abbey—the fox, trying to make his way back to his starting point, was run into, and killed, not a mile from Canon Court. Vean, who had ridden his mount out in the Everlook meadows, turned bridle, and rode home, but came back at once on a fresh horse, before the fox was thrown to the hounds. The fences had been heavy, and the ground deep; and there were not more than a dozen men, standing round, by their panting horses. Among them was the stranger in the old pink, who, riding up to Vean, and shaking his fist in his face, shouted: "You said you'd horsewhip me! now do it! But if you do—the first day you'll be food for the surgeon; and the next day you'll be food for the undertaker"—"and," shouted an old farmer from the outside of the small circle, "the third day he'll bury thee himself!" It transpired that the man in the seedy pink was Badger, of H——, a notorious sporting parson of a sort that was a rarity in those days, and was fast dying out. I need not say that the farmer's finale was a relief to Vean, who was not ungrateful. The stranger's grey horse then was recognised as a famous fencer, to whom it's owner had given the name of Gehazi, "because," said he, "he's a lepper (leaper) as white as snow!"

And now we come back to the dog. Vean was a born dog-breaker; for, like poets, they must be born; you cannot make them. All his dogs were remarkable specimens of educated intelligence, but chief of them all was the dog whose name heads this article.

My first introduction to Sambo took place on a day in September, somewhere in the last half of the thirties, when, my father having entrusted me with a letter of some importance, which I was to deliver into Vean's hand, I chose to ride up Limekiln Lane, which runs into Emtone Fields, and which, before Chipping Norton took rank as a post-town, had formed a portion of the road between London and Worcester; but had been abandond long before I was born. I believe carts did occasionally travel along it, but how they managed, I cannot say; for there were many places where a horse could not pass without sinking—not to his hocks merely, but over the stifle joint: indeed, I believe a horse might have been buried in some of those quagmires, and never discovered till the bones were turned to stone, and some new Huxley arose to found new theories on the remains. However, my horse and I got on somehow, now squeezing through a gap and cantering along two or three fields, and now returning to the lane where it ran on high ground—till we came to the cross road leading to Canon Court. Just as I turned into the road, which was new and sound, I heard the report of a double barrel, and, a little further on, near a gate, came upon a saddled horse with the stirrup leathers crossed over the saddle, and the snaffle rein hanging in front, and held in the mouth of a liver-coloured dog, between whom and the horse a perfect understanding seemed to exist. I could see Vean at the other end of the field, which was an old-fashioned stubble with plenty of cover and a brace of pointers drawing steadily up wind; and while I looked, another covey was flushed, and a brace of birds fell, one to each barrel. Presently, a hare was started, but carried off the best part of a charge in its hind leg. Vean looked up, and blew a whistle, at the same time calling to me

to wait for him. Sambo, giving me a glance, dropped the reins, and was over the gate in a flash, caught the hare in the next field, and took it to his master, and then, at his order, brought it up to the gate; where Vean shortly arrived, and I was formally introduced to Sambo. We then went on to Canon Court, where Vean showed me the post-bag, which it was Sambo's duty to take to the village post office, distant a little over a mile, every morning with the outgoing letters, and to bring back with letters for the family. There were no railroads in those days, and one daily post was considered ample.

My next meeting with Sambo was at a dinner party at Canon Court, where an empty chair was placed at Mrs. Vean's side, which at a given word was occupied by the dog, with a table napkin carefully pinned round his neck, and hanging in front of his chest. Two plates were set before him, one containing a slice of meat from the joint, cut through in slices, but so as to appear whole, and in the other, a slice of bread cut in the same way. Then Sambo, at command, stood up on the chair, and being told to say grace, gave three short barks. Poor dog! he was at least as thankful as any of the guests: perhaps more so. Then he began his dinner, carefully taking, one at a time, the divided slices in the most delicate way; and when told by his master, taking a slice of bread. It was, "Now a bit of meat, Sambo—now a bit of bread," and so on, till the plates were emptied. There was no hurry, no scramble; the meat and bread were taken slice by slice off the plates, which were left quite clean; and then, a glass cooler, full of water, was placed before him. This, though quite full, he managed to empty without spilling a drop; he then lifted his head, repeated his grace, and then, his napkin being removed, as free from stain as when put on, jumped from the chair, and made the round of the table, selecting those among the guests whom he knew, but carefully avoiding those who either disliked, or did not understand dogs.

On another occasion, Vean sent the dog, after the ladies had left the dining room, for his slippers. I let him out into the hall, the swing door from which, towards the front stairs, could only be pushed open in one direction. Having passed through this, he went to the dressing room, on the same floor, got the slippers, and then, knowing that he could not repass the swing door, darted up the front stairs, and along passages to the back stairs, which he descended, and soon reappeared in the hall at the dining room door. Surely something more than instinct must have guided the dog in this feat!

The next time I saw Sambo he was playing the part of valet to his master. The meet being beyond Canon Court, I had been invited to breakfast there on my way up to covert; and starting very early (I had a horror of being late on a hunting morning) I arrived while Vean was in his dressing room, and on being announced, was loudly told to come in; which I did, and found Vean in his dressing gown, occupied in removing yesterday's growth from his chin, Sambo sitting up, and regarding the operation with a look of quizzical interest, as much as to say "I have seen that before, but I am on show, and must make pretence of being interested." After greeting me, Vean turned to the dog, and said "Fetch my shaving-towel, Sambo." Now this shaving-towel was hanging on a large clothes-horse which stood just opposite to where Vean sat, at right angles to the fire-place, which shed a bright glow of heat upon the room; and upon the broad polished stand that formed its support—their lower parts bright as a mirror, their upper, brought to that perfection of flesh tint which tops, manipulated by a through artist, could alone display—stood the top boots which, in those days, completed the get-up of the hunting man. Now Sambo well knew that, for his life, he must not touch those boots with either paw or tail; he hesitated a moment, and then sprung up and stood upon his hind legs, his paws resting against the marble pillar of the chimney piece. Then, deliberately throwing himself back, and in his fall, snatching the edge of the shaving-towel with his teeth, he rolled over, quite clear of the boots, and, jumping up, delivered the towel to his master, on the opposite side. A clever trick, more deliberately planned

or more neatly carried out, it has never been my fortune to see.

My last interview with Sambo was as follows. Old Lord Ducie (the first Earl, who died in 1840) being on a visit to his daughter (my uncle's wife) at Sarsden, my father took him to see Vean's little pack of beagles, which were quite the show sight of the neighbourhood. Vean was very proud of them; and they certainly were beauties, and as good as they looked, and brought their hares to book in first rate style. Sambo was always out with them, following close at the heels of his master's horse, and apparently taking not the slightest notice of the pack, or their quarry. It so happened that one of the hounds, a bitch called Madcap, in jumping a ditch which ran across a gap in a blackthorn hedge, landed upon a stout thorn, which tore her foot and broke in it, making a nasty wound. Vean cut the thorn out, but the poor dog was incapacitated for further work, and it was necessary to send her home, a distance of two or three miles. We were gathered round, pitying the poor bitch, who was evidently in great pain, when Vean called Sambo, who came up at a gallop, and seizing Madcap by the neck, began to shake her, evidently under the impression that she had misbehaved, and that it was his business to punish her, or to hold her while punishment was inflicted. "No, Sambo," said Vean, "you mustn't shake her; she is a good bitch, but has hurt herself," holding up the injured foot. "Take her gently home to Joe (the kennel man) and take great care of her." You should have seen how the whole attitude of the old dog changed. He licked the wounded paw with his tongue, spoke to the beagle in their own language, took its ear in his mouth, and walked quietly away; and that afternoon, across the fields, and under the gates, and along the grassy sides of the lanes might be seen a limping beagle in the custody of a smooth-haired reddish dog, that might have been a lurcher, but was one of the best retrievers, and certainly one of the cleverest and best trained dogs in broad England, marching slowly along in the direction of Canon Court. The old Earl was enchanted;

"And by black Phlagethon he swore
That since he lived upon the moor
He ne'er had seen such sight before."

The quotation is from a poem of the West, but it will serve to express the utter astonishment of the old nobleman; and I cannot recall his exact words.

The family have long left Canon Court; one of the girls married into the Church, and another into the Peerage. A younger lot of girls grew up much later than those who had been our playmates in childhood; and my last recollection of the family is that of meeting, one afternoon, years after the old Earl and Sambo had passed away, in a pathway between the villages, one of the youngest Miss Veans. The pathway was broken by fairly high and thick stiles; the girl sat quietly on a clever little horse, one arm holding the bridle rein, the other encircling on the saddle bow a beagle, which might have been a grand-son, or daughter, of Madcap. She was going at an easy canter, and had just cleared one awkward stile when we met; she passed with a rapid salutation, and I watched her sail over three more obstacles of the same nature, as placidly as if they were open gateways; and then I lost sight of her. If alive, she is probably a grandmother; but I have never met another Sambo; nor do I think his equal has yet appeared.

Mr. J. Baynes, M.L.A., it is reported, has up to the present lost 390 out of the 500 Queensland heifers he recently imported.

In the *New South Wales Agricultural Gazette* Dr. Cobb gives some interesting particulars of the giant harvesters at work in California, where the conditions at harvest time are very similar to those prevailing in this State. The machines cost up to £1,600 for the largest steam traction harvesters. Dr. Cobb states that some of the best of these cut a width of 24 ft. to 27 ft., and require seven men and a boy to run; they consume about two tons of coal per day, and harvest up to eight acres per hour, or 1,000 bush. per day, which make the cost of harvesting, cleaning, and bagging about 3d. per bushel, not including cost of bags. Some of the machines are fitted with tires 7 ft. wide for work on sandy country, as their great weight causes them to sink deeply. The horse traction harvesters do not require so many men to attend to them, but usually from twenty to thirty mules or horses are required to draw them. All these harvesters cut the straw to within 8 in. to 12 in. of the ground, the threshed straw being deposited in heaps in the paddock.

Agricultural Chemistry for Beginners.

CHAPTER VIII.

By Archibald Pearce.

POTASH.

IF some fresh wood-ashes are shaken up with a little water, we shall apparently notice that they do not dissolve at all; but let us apply a few tests to try and prove the truth of otherwise of our observation. First, strain off the water through cotton wool or, better still, white blotting-paper; we shall obtain a liquid nearly as clear as water. But let us taste it; it has a kind of soapy flavour; test it with red litmus paper, the colour changes to blue; drop a few drops on to hot iron, a whitish deposit remains. We must therefore conclude that wood ashes contain a white alkaline substance which can be dissolved out by water, leaving the larger portion of the ash as an insoluble residue. This substance is one which for many years was manufactured in just this way; in countries where wood is cheap and plentiful, like Russia and Canada, large quantities of timber were collected and burned, the ashes soaked in water and strained off, and the liquid boiled down in large iron pots till only the solid substance remained, and to this the name pot-ash was given. If this potash is treated with an acid, it effervesces and gives off carbon dioxide; it is therefore a carbonate, and we now know that it is the carbonate of the rare metal potassium. If this potash is boiled with lime, its alkaline properties are very much increased, in reality it has become a new potassium compound called caustic potash, which is made in large quantities for the manufacture of soap and other purposes. Its chemical name is potassium hydrate. Now, unfortunately, the term potash is used very loosely in ordinary language, no less than three different substances being spoken of by this same name, which is confusing and misleading. First, there is the potash which is obtained by washing wood ashes, and which is really the carbonate, as explained; secondly, the hydrate, made by boiling the carbonate with lime, is often spoken of simply as potash; while the compound which properly and correctly has the name of potash given to it is the basic oxide of potassium, from which all the potassium or potash salts are formed. We must remember then that when we speak chemically of potash, we are always referring to this oxide, because we compare the value of all potash salts by calculating how much of this oxide each of them contains.

If the ashes of any plant, or any portion of a plant, are examined, we are always able to detect the presence of potassium in the form of its carbonate, and hence it follows that all plants must have potash salts in some form or other for their growth. But all plants do not require the same amount, nor are all parts of the same plant equally rich in potash. We find that the ashes of the trunk of a tree contain very much less than the same weight of ashes derived from the twigs or leaves. As a general rule the harder and older the parts of a plant are the less potash they contain. Again, some kinds of plants can get on with comparatively little, while others require a large amount. Of plants of the latter kind, the potato is pre-eminent, and this crop may be said never to fail to give an increased return for manuring with potash. Tobacco also has almost always a potash dressing applied to it. Root crops and leguminous crops, too, like a good supply, while cereals only need an application when the soil is very poor in this form of plant-food. On such soils fruit trees are grateful for an additional quantity; it is said to have a tendency to produce a growth of fruit, while nitrogenous manures help to make the trees run to wood. The question then arises as to what soils need potash manuring most. Of course a definite answer with respect to any special soil cannot be given without an analysis, but it is possible to some extent to judge from

the character of a soil what the probabilities are. Almost all the potash contained in the soil came originally from the wearing down of a mineral called felspar, which is a constituent of the older rocks like granite and whinstone, and soils derived directly or indirectly from these rocks will generally contain sufficient potash to keep them going, except for specially potash-loving crops like potatoes. Such soils are usually clays or clayey loams. But sandy soils, which consist largely of grains of quartz, are almost always poor in potash, since quartz does not contain any. Moreover they have not so much power as clays of holding soluble salts in their grip, so that the rain does not wash them away, and therefore any potash they may obtain has a tendency to gradually diminish in quantity. Any soil which contains an abundance of decaying organic matter will naturally not be very deficient in potash. There is one rather remarkable point in connection with sheep-farming which is worth notice, and that is that the grease of wool contains nearly half its weight of potash salts, and in the wool-washing districts of France about £100,000 worth is extracted annually from this source. It is therefore to be noted that on a sheep-farm large quantities of potash are removed from the soil every year in the wool, and that the soil is more rapidly exhausted of this constituent if grazed by sheep than by other animals.

Wood Ashes.

There are four substances in use in the Colony which are applied to the soil in order to supply it with potash; these are wood ashes, sulphate of potash, muriate (chloride) of potash, and kainit. The first of these is an excellent manure, if it can be obtained in sufficient quantity, because in addition to the potash it contains all the mineral constituents of the original plant with the exception of the nitrogen, and of these the chief are the lime and phosphoric acid. As has already been pointed out, the value of a potash manure must be decided by the amount of potassium oxide it contains; but that of ashes varies so greatly, both according to the kind of plant they were made of and the soil it was grown on, that it is impossible to give even an average percentage that might represent their value nearly enough for practical purposes. To illustrate this fact, and also that some plants need more potash than others, a few instances are given below, showing the amount of ash, and of potash contained in it, obtained from 1,000lbs. of the dried products mentioned:—

	Ash.	Potash.
	lb.	lb.
Pine wood	3½	½
Oak wood	13½	1½
Willow wood	28	2¾
Vines	89	41½
Oat (grain)	29	11
Maize (grain)	15	5½
Oat (straw)	54	10½
Potato (tuber) ..	43	27

Sulphate and Muriate of Potash.

These are concentrated manures, the former containing about 50 per cent., the latter about 60 per cent. of potash. These are the qualities that have been on sale in the Colony, but lower qualities are made, and a guarantee should always be required in buying. They are at first sight rather costly, but it must be remembered that in buying them one obtains a large quantity of potash in a small bulk, and hence a great deal is saved in freight. The price of both is nearly the same, so that the potash in the muriate is the cheaper. Some agriculturists, however, feel a reluctance to use chlorides (*i.e.*, muriates, see Chap. II.) in any form on their crops, as there may be, in some cases, a danger of harming the plant. In the case of tobacco, there is no doubt that chlorides are harmful. Still, the muriate has been largely used, and with success, so perhaps the danger is rather remote.

Kainit.

This is a natural mixture of various salts obtained from mines in Germany, containing little potash compared with the other two, only about 13 per cent. Accordingly it takes about 4 tons of kainit to give as much potash as a ton of sulphate, and 4½ tons to equal a ton

of muriate. Being sold exactly as it is dug, it is not expensive, but where it has to be carried any distance, the cost of carriage usually makes it cheaper to buy the concentrated salts. The potash exists in kainit in the form of sulphate, the remainder being chiefly common salt, about 30 per cent., and the sulphate and chloride of magnesium. It is rather dangerous to apply in contact with the seed, on account of the action of the salt in it; it is said to be very useful for mangolds, which being originally a seaside plant, delight in a little salt.

QUESTIONS.

1. What are the manurial ingredients contained in wood ashes?

2. Why are wood ashes spoiled if left out in the rain?

3. Mention some crops that specially need potash?

4. Name the ordinary potash manures.

5. If kainit costs £3 10s., muriate and sulphate each £15 per ton, which is the cheapest to buy (*i.e.*, from which do you get the most potash for the same money)? Will it make any difference if you live 100 miles from the place of sale, the cost of carriage being 1d. per ton per mile?

6. Why is it dangerous to put kainit in the drills with the seed?

7. What sort of soils stand most in need of potash manure, and which least?

8. What different substances are called potash?

9. What parts of a plant contain most potash?

Notes on Pig Farming.

By J. BONNAR, of Mount Partridge, Maritzburg.

(The following notes were written at the request of the Minister of Agriculture, in reply to a Transvaal correspondent, who had applied for information on the subject treated.)

A PIG is by nature a cleanly animal, and it is a shame to keep it amongst muck and dirt. Such a condition is most unhealthy for it, and unprofitable for the owner. Pigs are subject to rheumatism from damp and cold. The purer the breed, the greater the tendency in this respect.

To farm successfully with pigs, especially in a warm climate like that of South Africa, the following points are of vital importance:—

1. Plenty of open shade in daytime, say by a covering of branches supported on posts, open on all sides, giving shade and ventilation. Branches make a good roof for such a shade, the rain can get through, moistening the shaded ground beneath, which consequently is always cool to lie on in hot weather. This shade should be where the pigs run in the daytime. It is said the white pigs do not stand the sun so well as the black pigs. It is the only point in which the white pigs (middle whites) do not excel. Given proper shade, that point is quite overcome.

2. A dry warm place to sleep in. In warm weather pigs prefer to sleep out in the open, as fleas are liable to congregate in the sheds unless the floors are hard and disinfectants are used. Dry lime sprinkled on the floor is a good remedy.

3. Plenty of fresh water to drink and wallow in. Pigs clean themselves of dirt and vermin by wallowing in the mud, and cool themselves in that way.

Fresh water, plenty of it, is an absolute necessity. Pigs are very subject to indigestion from gorging and from being fed with rich swill, without getting enough clean water to drink as well. Fancy a man drinking nothing but gravy? A human being counteracts acidity in the stomach by taking a pinch of soda. Pigs should be supplied with ashes for the same purpose. These they will munch with avidity.

The writer visited one of the foremost farmers in Natal noted for his success with all kinds of well-bred stock. This

farmer asked the writer to look at his well-bred Berkshire pigs, as many of them had paralysis in the hind quarters. They were in a comfortable kraal and were well fed, and he could not account for it. The writer asked if the pigs always got clean water to drink. Yes, there were troughs for their food, and one trough into which water alone was always put for them to drink. Water could not be supplied otherwise, having to be carried, and the pigs could not be let out. On inspection, the water trough was as greasy as the others. It could not be otherwise. The pigs, with muzzles dripping with grease, passed from one trough to another constantly. The troughs, too, were of wood, and would be saturated and sour. The writer gave it as his opinion that indigestion, consequent on the insufficiency of clean drinking water, was at the root of the evil, and suggested ashes. The farmer had not heard of that. There were the remains of a large wood fire close by. The writer threw some charcoal amongst the pigs; they seized it, more was thrown in; they fought for it. The farmer exclaimed, "Dear me, I never say the like of that." The writer enlarges on that, because it is a most important point, generally lost sight of.

The writer's pig enclosures are below the water furrow, and have running water always flowing through them wherever the pigs happen to be enclosed.

Occasionally a pig will be noticed to be dull and feverish. A cupful of castor oil floating in a little milk, if administered at once, the pig being starved for the day, will almost always effect a cure. But the dose has to be given with caution. A pig is very easily choked.

Rheumatism, from brutal exposure, and indigestion seems to be the root of all pig ailments. If a pig is really ill, and a clearing out does not restore it, it should be removed and killed at once. It is the safest and most economical plan. Pig fevers are infectious and fatal.

Pigs should have plenty of room, no crowding. They will crowd together when they want warmth, but like to select their own places to lie in. The cheapest and most secure enclosures are made with barbed wire. Pig wire netting is useful for small spaces, but does not last like wire, and when it does give way, gives endless trouble. The writer's fences are of ten barbed wires, the lower wires three inches apart, standards 24 feet apart, between the standards are five lacings with No. 12 wire. The straining posts are well anchored and the wires tightly strung. The lowest wire has to be on the ground, or slightly below it, and for this purpose the ground has to be well levelled the entire length of the fences. Such fencing is expensive. The writer's feeding enclosure is over an acre in extent, thus fenced, with stone kraals and sheds standing open for the use of the pigs if they desire shelter.

The sows with young are kept in a separate shed, divided into loose stalls of ample size. These have hard floors and are always kept cleaned out. When about to farrow, the sow is put into a handy paddock by herself. She is best left to herself.

If the weather is bad, a covering is put over the nest she has made for herself. When all the family have arrived they are removed to a stall in the shed. It is well to have these stalls fitted with strong rails running all round them inside, nine inches from the wall and nine inches from the ground. A sow likes to lean against the wall and slide down when she lies down. If she leans against the wall, and the little ones are between her and the wall, they would be crushed. If they are between her and the bar when she leans against it to lie down, they can slip out between the bar and the wall. This device will save many a little one. Sows with litters should be kept apart for a month, and have a separate cultivated paddock to grub in, otherwise other weaned young pigs will steal the milk and her young ones will suffer.

Young pigs should be well fed, and run on cultivated crops. Cow's milk is a grand sheet anchor for them. Once stunted, they will never grow. In the writer's feeding enclosure is a square space strongly railed off. In that are the young pigs' feeding troughs. The young pigs can squeeze in between the railings

and feed in peace, for the larger ones cannot get in to disturb them. All troughs are of iron, and are easily kept clean.

The pigs are fed night and morning, and are run out on the veld during the day. They root actively early in the forenoon and late in the afternoon; but during the heat of the day they lie about in a wooded donga through which is led running water, with pools for their convenience.

Paddocks, of about four to six acres each, well fenced, are cultivated for pig food exclusively. The pigs are turned into root in the newly turned over land on the aftermath, or to live on the crops themselves.

Pigs should be made to feed themselves in a great measure, otherwise they will never pay. It should never be lost sight of that the pig is a graminivorous animal, which, in its wild state, lives on grass and roots, and should always have green food. Let him out to grass and he will half feed himself. It is a great mistake to keep pigs fat in this climate. They should be in good, healthy, active, growing condition, and only fattened up for the butcher.

It is quite a fallacy to think pigs will find much sustenance in a vlei. Food must be grown for them. For this purpose, buckwheat is a grand crop. The pigs can be turned in on it six weeks after it is sown. When nearly fed down it can be ploughed in, and six weeks later it is ready again. Lucerne is another sheet anchor when it is properly established. Barley, oats, and other grain crops, sown alone or with vetches, to be eaten off green or fed to them, are grand winter sustenance when under irrigation. Barley and vetches sown together, the barley can be cut green for market, then the vetches sown come away under irrigation, and the pigs revel in it. Cabbages are very fattening, so are mangolds. Pumpkins and Kafir melons help. Swedes are good, but not turnips. The pig weed, *Umbuya*, is worth sowing in odd manured corners. Down here near Maritzburg, sweet potatoes are a grand stand-by for winter. Pigs are equally fond of the tops and the roots, and the plant is proof against locusts. Sweet potatoes make excellently flavoured bacon. Round potatoes are no use whatever unless boiled. Pigs are very fond of teosinte, but it is only a summer, and almost a coast, crop. Sugar-cane they are very fond of. Treacle, even linseed meal are capital additions to their food. Brewers' grains are useful to fill up, but should not be given in bulk, only mixed with other food, and well soaked, they swell so. Green mealies cut and carried to them come in handy when fattening. Dry mealies are an expensive food, and should be used but sparingly, and either soaked or ground into meal.

It would be worth while a pig farmer planting a forest of oaks. Acorns come in just when wanted, and make grand bacon.

When deciding what kind of pig was best to go in for, the writer made enquiries in all directions. He found the black pig to be the farmers' fancy. They reject a white pig very much as they would reject a white ox for transport. But on the whole the trade prefer the white, the two rival breeds being the Black Berkshire and the Middle White Yorkshire. The Berkshire has too much head and shoulder, and these are the coarser parts, and it is a shorter pig, Without the shoulder, the side is too short to give a good flitch of bacon, and the Berkshire is not easily fenced in, while the Yorkshire is a fine, long bodied pig, well proportioned, coarse nowhere, and has a quiet contented disposition, grows well, fattens readily, and gives a fine, clean, attractive carcase. The large Yorkshire is too big for this climate, where people are conscious of having livers, and do not like too fat pork or bacon; but the middle-white Yorkshire makes an ideal pig. A first cross between a middle-white and a Berkshire gives an excellent pig for the market, but the cross should not go further.

When the writer wrote Home for middle-white pigs, he told his agent that "as he was going to the expense of importing, he might as well be at the top of the tree; to consider quality rather than expense." The consequence was he got

sows that were really not for sale; had been reserved by the breeders for show purposes in England, and the sire of the boar he got had won 20 prizes and championships. The sows, before being shipped, were put to other thoroughbred boars of other strains than the boar sent, so that the writer got a very varied, pure-bred assortment to start with. When Ladysmith was invested and Natal threatened, Government sent appraisers round Maritzburg district to value all farm stock, in case the Boers should come and sweep it off. These imported pigs were officially valued at £40 each.

Everyone was against the writer when he proposed trying pig-farming, and said pigs would pay to buy from the Kafirs ready grown, to feed up and sell off when mealies could be had at 5s. a muid, but not otherwise; it would never do to breed them in any numbers. The writer contended that the Kafir pig was the worst pig to work on, that mealies were the worst pig food to give them, and that a good breed of pigs properly fed should pay; but he had to find out for himself in the main how to solve the problem. Mr. W. Nicholson, of Sneddon, near Richmond, Natal, gave him much good advice.

Pig-farming sounds easy. It spells cheap stocking and quick returns. In reality it is the most expensive stock farming to go properly into, that is as a sheep farmer will go in for sheep, or a dairy farmer will undertake dairying. Pigs require constant attention, regular feeding; they won't stand neglect or irregularity in that matter, and they require a lot of food if sufficient numbers are kept to make the venture pay, and they cannot be left to the care of the hired labour available here. They should be kept in separate herds according to ages and sex, and only fencing of the very best can do that, and pig proof fencing is expensive. If herding is necessary, they require the very best herds, and if there is very much unfenced cultivation about, herding is impossible. A pig cannot be seen in long grass or in a mealie field, as an ox can, and if they get into a neighbour's crops they leave ample evidence of their having been there, for they put their whole heart into their work and display a singleness of purpose and energy of execution that would command respect under other circumstances.

Further, unless quickly reared and sold off within the twelve months, they eat their heads off. The only time pork is marketable in any quantity in this country is in the winter. It requires no little management to make all these conditions fit in one with another.

The writer started with the idea that pigs at any rate could not be easily stolen without raising an alarm: he never made a greater mistake.

There is one difficulty in pig-farming in South Africa that the writer does not know how to cope with. Why do farmers get so little from butchers for their Kafir-reared, fed-up pigs? Because all such Kafir-bred pigs have lived on the excreta to be picked up round the kraals. The Kafirs suffer much from worms, and the pigs get them from them, and however well the pigs look when sold by the farmer, the butcher knows that, when they are killed, a very large proportion of them may be found unfit for human food from this cause. To guard against this, the writer insists on his Kafirs retiring to a certain part of his farm where the pigs cannot go. But so long at natives can trespass in all directions on private property as they do, so long will the pig farmer be liable to loss on this account; and the loss may be very serious, for, with the greatest care, the evil cannot be remedied under four months. Once his pigs are killed and found to be infected, it may be at the commencement of the winter season, the season, the whole year may be lost.

The labour question is a serious difficulty. Both Kafirs and Indians have many objections to working with pigs, and these scruples have to be overcome by higher wages.

The writer had been told that the attempt had frequently been made to farm pigs, *i.e.*, as principal stock of the farm, but had never been attended with success. But the plan seemed so easy, the returns so rapid, that he did not realise the difficulties of the undertaking until

he discovered them, one by one, for himself. It is only by very considerable outlay in the first instance, especially where there is much cultivation about, and by close, unremitting attention, that success can be secured.

Photo by Editor.

Propagation House, Durban Botanic Gardens.

THE above represents the interior of the principal Propagation House of the Durban Botanic Gardens. Along one side of the building run hot water pipes, and during nine months of the year they are on service every night. On the chance cold, wet days of the remaining three months, artificial heat is also supplied.

The Butter-Making Capacity of the Jersey.

MR. JAMES LONG, in the "Agricultural Gazette," writes :—It is not easy in these days of great performances on the part of dairy cattle to differentiate as between leading breeds, and to determine which breed is likely to prove the most profitable on any particular farm. Possibly much depends upon the preference of the owner of a herd, his likes and dislikes, upon the help he is likely to obtain in his own household, and on the amount of energy which he is disposed to introduce into the business of butter production. Even though it be possible, owing to the help of some skilled maker, to produce the very finest article, it may be found uneconomical to produce butter if there is no one to take any interest in its sale. Mere delivery to a country provision dealer is not likely to be attended with success; hence, whatever may be proved on the part of the Jersey, it does not follow that she may suit the requirements or fit the capabilities of those to whom she is able to render great service. Given, however, a case in which a dairy farmer is able to devote real interest in the breed which he believes will pay him best, and that he possesses a first-class butter maker, the means to obtain the best cattle possible, and the energy to sell the produce to the best advantage, then it is by no means certain that the Jersey is not the most profitable cow in existence. Reference is not made to herds as they exist, but to the capacity of individual animals, and what might be rather than what is. No doubt if a test were made as between the best Shorthorns to be found and the best Jerseys, there would be discovered more supporters of the large than of the small cattle, but it does not follow that the small cattle would not win if net profit were to form the basis of the result. Perhaps we may take it for granted that what exists in one particular case may be found to exist in another; that if one Shorthorn is capable of producing 1,100 or 1,200 gallons of milk in a year, others can be found to do the same, and, similarly, if one Jersey can be found to produce $2\frac{1}{2}$ to 3 lbs. of butter in a day at the end of six months after calving, there are others which can do approximately as good or better work. I desire to endeavour to show what is possible on the part of the Jersey, and I take as an example one of the two best cows, each of which produced 2 lbs $6\frac{1}{2}$ ozs. of butter in a day during the recent test in Jersey Island. The cow in question is named Fancy's Rose; she gave $30\frac{1}{2}$ lbs. of milk, from which 2 lbs. $6\frac{1}{2}$ ozs. of butter were obtained, and this was 240 days, or eight months, after calving. Most of us have yet to learn that a cow reaches her maximum when her owner is thinking about drying her off. I hope it is not an assumption of an improper character, but few, if any, readers will deny that she must have given at least as much butter per day, on the average, since she calved, inasmuch as she had passed through the whole of her best milking season, and, therefore, it cannot be unfair to argue that she should have given at least an average of 2 lbs. 6 ozs. of butter during the whole of the 240 days. Jersey butter is not an article which has a market quotation in this country, but I believe, speaking from what personal friends obtain, that this butter is easily sold at 1s. 6d. a pound throughout the year. Let us, however, in this case base its value upon an average price of 16d.; at this rate 570 lbs. of butter, taking no account of the odd half-ounce per day, would have realised in eight months £38. Again, if we assume that the average milk yield was as much as, but no more than, the quantity given on the day of the trial, and make a fair deduction to account for the waste in butter-making, we get the quantity of skim milk to be valued as equal to 660 gallons, which, at 2d. a gallon, is equal to £5 10s. If it were sold for the consumption of man it would be or should be worth considerably more, but Jersey milk is worth every fraction of the figure allowed for the feeding of calves alone. Here, then, we have a return of £43 10s. for eight months' milking; but we surely have something yet to add. If we allow the cow to milk for two months longer, or sixty days, and take an average of one-half the yield

upon which these figures have been based, or six quarts a day, we have 90 gallons of milk to account for, equivalent to 1 lb. 3 ozs. of butter per day, and 80 gallons of skim milk. The milk will be worth 13s. 4d. and the butter £4 15s., so that adding £5 8s. 4d. to £43 10s., we get £48 18s. 4d., which might easily be converted into £50 or more on the valuation of the calf. I have endeavoured to deal with hard facts, and to suppress any suggestion of possibilities which may not become actual.

It may be pointed out that one swallow does not make a summer, and that because one cow has produced such a yield, it does not follow that others could be found to do likewise. But, as a matter of fact, there have been many cows which have exceeded this yield in a day, and in the same competition a cow was awarded the bronze medal, which gave precisely the some yield of butter at the end of 137 days after calving, and this butter was extracted from no less a quantity than $38\frac{3}{4}$ lbs. of milk. Again, and this new fact shows the wonderful power of a Jersey in the production of rich milk, a cow named Violette, at the end of 220 days, produced $26\frac{1}{2}$ lbs., which yielded 2 lbs. $4\frac{1}{2}$ ozs. of butter, thus showing a ratio of $11\frac{2}{3}$ lbs. of milk to 1 lb. of butter. It can scarcely be credited that a pound of butter was actually present in but little more than a gallon of milk. Yet, although this was the lowest ratio, there were two other cows which produced milk of almost equally good quality; one of these, at the end of 256 days, producing 1 lb. $12\frac{1}{2}$ ozs., her ratio being 12·35. No doubt milk is richer as cows approach calving, but such quality is very seldom found. Now this evidence, which might be supported with a great deal more of the same kind, appears to me to prove beyond dispute that just as these cows have been produced by judicious selection and crossing, so may the dairy farmer increase his yield of butter, whether from the Jersey or from any other breed, by adopting the same process. Suppose, for example, that an individual made a start with a selected herd, his first calf being a bull, the produce of such a cow as the animal to which we have referred, Fancy's Rose, and suppose, too, that he selected cows for milking and market purposes of similar quality. He might possibly be required to pay very large sums for prize takers like Fancy's Rose, but there are other cows in existence, if anyone takes the trouble to find them, and such cows selected one by one, mated with the bull in question, or one of equally good butter-making blood, would certainly produce a large majority of milkers, upon which the utmost reliance might be placed for the production of butter. I remember to have remarked to a friend, himself an amateur farmer, that it was always wise to be willing to pay £1 or £2 more for a cow with a character as a milker, adding that I was willing to do so myself. This gentleman at once said, "Then I can tell you where you can find just such a cow as you believe in, if you are willing to pay this extra price." Having been in his possession at one time, the animal was easily found, and purchased for a pound or two more than her market value, with the result that at the end of her second calving period she had yielded, and during that single period, too, some 1,290 gallons of milk; while her calves not only sold well, but were much appreciated by buyers. It will be proper to add that they were not Jerseys.

There is one matter in relation to this question which always needs consideration. Most of my more intimate dairy farming friends make a practice of selling their cows almost always without regard to their milking value before they approach anything like old age. In a word, they are sold with age on their right side, that they might sell well. In order, therefore, to secure an extra pound or two in money for the sale of beef, for this is what it mostly amounts to, thoroughly reliable cattle are turned out of the herd, and very often, in most cases indeed, unknown cows are brought into their places. How is it possible to breed with success under such conditions? The owner of large cattle rejects the suggestion of the breeder of Jerseys that a good cow is worth keeping. His chief argument is that the Shorthorn and other large milking breeds possess a carcase value under all conditions until they became old, and so long as they are healthy, but that the Jersey seldom has any carcase value worthy of consideration, and none at all when she becomes an aged cow. If we refer to

Jersey records we shall find, as in some remarkable instances in Lord Rothschild's herds, that Jerseys milk wonderfully up to a great age, and that in consequence of the system of keeping them in the herd, it is possible to breed a number of animals from the very best cattle, and so to form a strain. The profit on the sale of a cow while still young may amount to £3 or £4 as compared with her value later in life, sometimes more; but what is that when spread over eight or ten years? If the Jersey, as she does when she is a good animal, leaves a liberal profit behind her every year of her life, the breeder can well afford to neglect a small sum, if any, which she realises when her life's work is concluded, and this more especially when a herd is always under selection, and when the best animals are retained for breeding as well as for butter-making purposes.

Increasing the Attractions of Shows.

IT is recognised by many, says the *Live Stock Journal*, that larger attendances of the general public are desirable at agricultural shows in order to meet the increased expenditure which the growth of these exhibitions has necessitated. There is a feeling also that the former atractions are not now sufficient to draw all the visitors not directly associated with agriculture who used to attend the meetings, because competition has become keener, and other bodies who cater for the public have displayed greater enterprise in providing what is wanted. The agricultural shows are, to a certain extent, the modern substitutes for the ancient fairs, which have been in many places also superseded by auction marts. The old fairs had several days which were devoted to business, and one was given up to pleasure. This latter element, it is thought, has not received sufficient attention from the managers of all our shows.

The object of an agricultural show is the thoroughly practical one of improving the live stock and agriculture of the country. It would be a regrettable circumstance if this fact were ever to be overlooked in the slightest degree. Consequently no one would suggest any curtailment or modification of the existing full classes for all varieties of breeding stock. Addition rather than supersession ought to be the policy in increasing the attractions of shows to the public.

The horse department is that which is most likely to provide attractions for the gate-money public. The sections for breeding animals should be maintained as at present, or extended where desirable, and if the example of the Shire Horse Society in giving prizes to breeders were followed, it would add to the interests of farmers. The group classes also give a new and useful feature.

Prominent amongst the recognised attractions of many shows are the jumping competitions, which with their regulation single hurdle, gate, double hurdle, wall and water, have become well-known institutions. The greatest credit is due to the originator of the bending competitions for polo ponies, which have deservedly become popular since they were first instituted. Occasionally, too, public interest is stimulated by a driving competition, but for this a large area of ground is required to do it well, such as the big ring of the R.A.S.E. It goes without further saying that in sport-loving England such competitions ought to be keenly contested.

Among other suggestions a correspondent says that bare-backed riding competitions would be likely attractions, even though they might be characterised by some critics as circus performances, though why a man's ability as a bare-backed rider should be derided whilst his seat in the saddle is applauded, no one who has witnessed the ride of the cavalrymen from the Canterbury Depot at the Military Tournament is likely to understand. Pursuit races, embodying mounting and dismounting, saddling and un-

saddling tests, should surely be the means of assisting "gates"; and, should it be desired to combine instruction with entertainment, an exhibition of breaking unmanageable horses might be appreciated by a good number of visitors whose duties bring them into collision with evil-tempered beasts. Then the parades of cart horses in gears might be increased and enlist the interest of the users of horses in towns and lead to further emulation amongst them, with the result that they desire to possess superior teams.

American Experimental Farms.

THAT the experiment stations in the United States have wrought a great change in the agricultural conditions in that country, is apparent in practically every State and territory. At the same time there is opportunity for much improvement in the methods and ways in which experimental work is conducted. In some States where the federal appropriation is supplemented by State appropriations, the stations are extending their work beyond the boundary limits of the station farm. Too many station workers seem to have settled down to work out great agricultural problems under the ceiling of an eight-by-ten office. Along some lines the book-worm and the laboratory grub can do their work satisfactorily within the narrow limitation of an office building, but with the rank and file of station workers, the State should be the laboratory, and farms with local conditions the textbook. It is painful to know that some men are retained upon experiment stations staffs and pay rolls on account of political or personal influences, rather than because of merit. In several instances such men have apparently done no original work, judged from the bulletins and reports of the station, for years, and their only published matter has been compilations of current knowledge. Such men detract from the position and usefulness of the many capable men who are devoting their whole lives to agricultural progress. On the other hand, there is a tendency for some station directors to take advantage of their positions and assume authorship of articles in practically every department pertaining to agriculture and its allied branches. Such a policy cannot fail to create strife and contention among individual members of the station, and personal animosity against such a director by the public. Where specialists are employed on a staff, these men alone should be responsible for statements on topics relative to their respective departments, subject, of course, in all instances, to the approval of the director. No station director has ever placed himself in the front rank and secured the confidence of the people for whom he has been working by using material of other departments in furthering his own ends to increase his popularity at the expense of the station. The man who selects some speciality from the vast number of professions and devotes himself to it thoroughly, usually has his hands full. This trite statement of the late Garfield is equally applicable to experiment station and college workers.

Agricultural Shows.

Greytown, Thursday 29th May ; J. M. Handley, hon. secretary.

Estcourt, Wednesday, 4th June ; Herbert Blaker, J.P., hon. secretary.

Maritzburg, Thursday, Friday, and Saturday, June 26th, 27th, and 28th ; A. Whittle Herbert, hon. secretary.

Ixopo, Wednesday, 16th July ; A. Ewing Keith, hon. secretary.

Richmond, Thursday 24th July ; John Marwick, hon. secretary.

Noodsberg Road, Thursday, August 14th ; F. Reiche, hon. secretary.

Return of Farms at Present under License for Disease in Stock.

Stock Inspector	District.	Disease.	Owner.	Farm.
A. B. Koe ...	Estcourt, between Bushman's and Little Tugela Rivers	Scab	R. C. O'Neil ...	Hillgrove.
		,,	B. J. Wilkes ...	Portington.
		,,	Du Plessis & Cloete	Compensation.
		,,	J. Snyman ...	Vitzecht.
		,,	W. Ralfe ...	Ernersdale.
		,,	R. M. K. Chadwick	Beechwood.
J. Button ...	Estcourt, South of Bushman's River	,,	L. Berthon ...	Littlecote.
		,,	J. C. Boshoff ...	Waterhoek.
		,,	C. Acutt ...	Connington.
		,,	S. W. B. Griffin ...	Willow Grange.
		Lungsickness	C. Harding ...	The Plains.
A. H. Ball ..	Weenen ...	Scab	W. Lotter ...	Doornkloof.
		,,	P Van Rooyen ...	Middleburg.
		,,	C. P. F. Van Rooyen	Mona.
		Lungsickness	Maboko	Bushman's River Poort.
E. J. B. Hosking ...	Upper Umkomanzi	,,	J. Baynes ...	Meyer's Hoek, Onrust, and Nel's Rust.
		Scab	C. Nicholson	Alton.
J. J. Hodson ...	Lion's River ...	,,	H. W. Shaw ...	Talavera.
C. E. Hancock ...	Ixopo	,,	C. L. Hammoud ...	Sunrise.
		,,	Quinisani	Arundel.
		,,	Mapundu	Springvale.
		,,	E. H. Surridge ...	Chadwell.
		,,	Makuko	Umzimkulu.
		,,	W. Gray	Helmsley.
		,,	J. R. Royston ...	Umgodi.
		,,	A. Watson ...	Rosehill,
A. Hair	Umgeni and Borough of Pietermaritzburg	Lungsickness	N'cundane ...	Zwaartkop Location
J. A. Morrison ...	Durban & Umlazi	,,	P. Saville ...	Umzimbazi.
		,,	W. Pearce ...	Lower Illovo.
		,,	Natal Government Australian Heifers	Vet. Compound, Durban.
W. C. Robbins ...	Lower Tugela and Mapumulo	Lungsickness	Jackson & Dykes	Sunbury.
		,,	F. Addison ...	Addington.
		,,	Thring & Bull ...	Langspruit.
W. Gray ...	Upper Tugela, S. of Tugela River & Estcourt, N. of Bushman's River	,,	Natives	Hongerspoort.
		Scab	D. G. Sclanders ...	Clydeside.
E. Varty ...	Umvoti, Western Portion	,,	P. Otto	Somerville
		,,	G. Nel, jun. ...	Summerfield
A. S. Parkinson ...	New Hanover ...	,,	Umshola & Makenke	Swaimana's Location
		,,	R. Smith	Effingham.

The whole of that portion of Natal north of the Tugela River has been proclaimed an infected area on account of Rinderpest.

The whole of that portion of Natal north of the Tugela River and the Province of Zululand are infected areas under the Lungsickness Act. Individual cases under license within these areas are not published. Information as to any case under license may always be obtained at the Office of the P.V. Surgeon, Pietermaritzburg.

The following farms are in quarantine for rinderpest :—

Ladysmith Division.—Farms : Riet Kuil, Kleinfontein, Vlaakplaats, Doornkraal, Zwaartkloof, and Kirkintulloch.

Upper Tugela Division.—Farm : Earthcote.

Newcastle Division.—Farms : Normandien District, Hope Farm, Eaglescliff, Lennoxton, Ingogo, and Charlestown.

Dundee Division.—Farms : Aviemore, Lincoln, Swiss Valley, Blesbokhagte (Bonny), Sheepridge, and Zanana.

Kranskop Division.—Farms : Jammerdaal, Frogmore, Elandsvlei, Entombeni, Sutherland, Buffels Hoek, Elands Kop, Drifontein, Scottsdale, Woodlands, Paul's Rest, and Middle Hoek.

M. J. HIME, for P. V. Surgeon.

Principal Veterinary Surgeon's Office, 26th February, 1902.

Return of Fruits, Plants, and Vegetables, &c.

Examined under Proc : 37, 1900. For the month of January, 1902.

Date.	Description.	Quantity.	Imported from.	Ship.	Remarks.
1902.					
Jan. 2	Seed Potatoes	1,585 cases	London	Goorkha	Free of Pest
„ 7	Table Potatoes	4,300 „	Bordeaux	Greek	„ „
„ „	„ „	3,000 „	Havre	„	„ „
„ „	„ „	1,688 „	Southampton	„	„ „
„ „	Onions	1,200 „	Bordeaux	„	Rotten on arrival and destroyed
„ 11	Rose Trees, account F. Dettrich, Hermannsberg ...	1 case	London	Illovo	Free of Pest
„ „	Seed Potatoes	287 cases	„	„	„ „
„ „	Oranges	125 „	Spain	„	Mussel Scale present, fumigated
„ „	Lemons	105 „	„	„	Do. Do.
„ „	„	50 „	Messina	Kurfurst	Free of Pest
„ 14	Oranges	15 „	„	„	„ „
„ „	„	500 „	„	„	„ „
„ „	Lemons	295 „	„	„	„ „
„ „	Oranges	200 „	„	„	Mussel Scale present, fumigated
„ 17	Seed Potatoes	100 „	London	German	Free of Pest
„ 20	Cocoa Nut Palms and Bamboos, account Mr. Colenbrander, New Guelderland	5 boxes	India	Umkuzi	„ „
„ 21	Hawthorn and Ornamental Shrubs, account R. W. Cole, Natal	1 case	London	Pembroke Castle	„ „
„ 29	Raspberry Plants, account Savory & Co., Point ...	3 cases	„	Dunvegan Castle	„ „

C. B. JONES, Examining Officer.

Custom House, Durban, 5th February, 1902.

Veterinary Departmental Report for January, 1902.

ABSTRACTS FROM REPORTS.

(*Concluded.*)

GREYTOWN.—D.V.S. CORDY.

Lungsickness.—No fresh outbreaks.

Glanders.—A very bad case of farcy glanders occurred at Mr. Dempster's, in Greytown, the subject being a pony. The animal was destroyed at once, and all stable fittings burned, and the place thoroughly disinfected. Two other animals which had been in contact were tested, and one of them, belonging to Mr. Clarke, of Greytown, reacted. After its destruction a post mortem examination revealed the nodules of glanders in both lungs. By burning the fittings and thorough disinfection, the stable has been rendered fit for use once more.

I have since examined a good number of horses in Greytown, but so far am pleased to state have seen nothing of a suspicious nature, and am therefore hoping that the disease has been stamped out.

Rinderpest.—Fourteen more deaths occurred at Jammerdaal, making a total of forty-six, just half of which were young calves. The disease proved very fatal to the young stock, especially the calves, only two of their number salting among the infected troop. No cases of the disease appeared among the two other clean troops on the farm, both of which were biled twice.

A fresh outbreak was reported at Mr. John Keyter's, of Frogmore, adjoining Jammerdaal, on the 21st of the month, and on the following day seven deaths occurred, and eleven more animals showed symptoms of the disease. There were about two hundred and eighty head of cattle on the farm which had fortunately been kept in three separate troops since Rinderpest appeared in the district, and as the disease only appeared in one lot, it permitted of the other two troops being biled while clean. No case has broken out among the latter, while twenty of the infected had died at the end of the month.

I visited Messrs. Reiche, of Noodsberg Road, to see case of Jagdzeikte, according to your instructions. The two doses of anti-streptocoun serum I injected into the trachea at an interval of about three hours, but with no favourable result, the animal dying the following day. Several animals in the Noodsberg district have died recently from this disease. Messrs. Reiche alone having lost five. It would be conferring a great boon on the horse-owners of that district could some light be thrown on the etiology of this disease, as at present all forms of treatment appear to be futile.

No cases of horsesickness were reported during the month.

RICHMOND.—D.V.S. BYRNE.

Lungsickness.—There has been an outbreak of this disease in a herd of Australian cattle, the property of Mr. J. Baynes, which were lately imported by Mr. Baynes from Queensland.

These cattle are running on the farm Meyer's Hoek, and have been inoculated. On January 30th Lungsickness broke out at Mr. Baynes' home farm Nel's Rust, and all the cattle there were inoculated on Friday, 31st January, and Saturday, 1st February. There have been no fresh cases of Lungsickness at Meyer's Hoek for some little time, and the cattle seem to be doing better.

Blue Tongue has been prevalent amongst sheep.

Towards the end of January, on instructions from you, I proceeded to Ixopo to investigate a disease in calves, which were suffering from diarrhoea and dysentery.

I had another case of hepatic fever in an imported horse this month; he made a good recovery.

The liming of land in England is a question that is receiving much attention just now. Lime was more frequently used in the olden days than it has recently been, due, no doubt, to the introduction of artificials and the monopoly of attention they have received.

The Horse in South Africa.

THE following interesting history of the horse in South Africa is contributed by Mr. Charles Cowen to the "Cape Times":—

We have no well-traced record of the history of the horse in the sub-continent of Africa. It is one of the many subjects which has yet to be dealt with by a competent hand. The work I believe to be easy and the material sufficient. The exploiter of the information has not far to seek for it.

The following memorandum, written without facilities of reference, may therefore not be wholly uninteresting: The earliest accounts tell us that in the days of Van Riebeek the horse was an unknown animal at the Cape of Good Hope. Nor was it known across the Great Gariep by the natives even in the third decade of the past century. For very obvious reasons of policy, the Dutch East India Company would not ship horses to their new settlement for many years; it was against their policy to allow their settlers and officials to make way beyond the narrow limits of the little plantations, lest they should provoke the ire and offensive force of the natives against them. At last, on the urgent solicitation of one of the Governors (which one I do not remember), the Council sent out a Barb, which was soon followed by other equine beauties. To that stock we owe our far-famed Cape horse, our Hantam breds, and our Basuto pony.

The Hantam area was the range of country which extended from the Atlantic to the present Herschell Reserve, with the Orange River along its entire northern line, and became ever celebrated for its compact, swift, enduring, fine-tempered, intelligent, and docile horses. This character it still maintains.

Whether the Barb mentioned arrived in the 17th or the early part of the 18th century, I do not remember. It is certain, however, that by the middle of the latter century the horse was a commonly known animal in many parts of the country, though not across the Great Fish River, and it is equally certain that the entire stock was of good blood wherever it was found, for only such had been imported and bred from.

In 1795, when the British were about to land, the Dutch Governor put nearly two thousand mounted men into the field to oppose their advance at Muisenberg. This shows how plentiful this useful animal had already become at the Cape.

An English cavalry officer, writing of the Cape horse in 1800, says there were a small race, spirited and hardy, worked on little food, and were capable of enduring a great amount of fatigue. They did not exceed, as a rule, fourteen hands in height, and up to that time were not deemed swift.

In those days the Dutch used to cultivate carrots extensively for their horses and sheep. A bunch or two were considered equal to acorn feed for an English horse. In some places the poor beast got nothing else for the day, if he could not nibble. This, of course, was in the Peninsula. In the country districts the feed was not the same. The ordinary farmers exercised no care in breeding horses; these were what they were, in spite of his neglect, sound, enduring, and wonderfully tractable.

A PAARL SALE IN 1858.

In 1858 I attended a sale of Hantam horses at a farm midway between Malmesbury and the Paarl. There were about 200. Some of these had had a halter upon them only occasionally. Others were "touw-wys," while most had never been handled at all. They came down just as they had been rounded up at the farm on the veld. My host was the royal dealer at Capetown. He gave me the points of the clump, and particularly directed my attention to the temper and conduct of those equine youths which were strangers to the hand, and had never been haltered. Buyers went into the midst of the stock, selected their purchases, made their boys slip halters on to them, lead them away out of the kraal, mount, and then handle them on the open veld. The spectacle was an amazing one to me, for the animals, at first apparently puzzled and bewildered,

in a remarkably short time were as docile as if they had been long in careful teaching, and readily at last allowed themselves to be trotted away with the respective strings and troops to which they were attached. The demands for the suppression of the Indian Mutiny swept the land of its horses, and it has never recovered from that denudation.

In 1796 several cavalry regiments, meant for India, arrived in time for Lord Elphinstone to place them at the disposal of General Craig. When they had accomplished their work some of them went on to their destination, others remained in the Colony. Now, these horses at that period were all of a sturdy stamp, and just suited to the country, being for light dragoon duties. But men then used not to be in Great Britain mounted on stallions. It is, therefore, reasonable, to conclude that those of the regiment at the Cape consisted of mares and geldings only, with the rare exception of perhaps an Irish rig or a Welsh runt—a fourteen-hand pony, which was allowed to retain one-half of its virility. But some of the officers then, as now, who were likely to be a length of time on the station, would import better blood for sporting, especially for racing, purposes. The late Mr Heatlie told me that his father, who was a dragoon officer, imported some of the best that England could send him. During the seven years' occupation the bone and muscle of the Cape horse was much improved by the military. On their return in 1806 many of those who were here previously came with their regiments, and were allowed to settle in the country. There were many of the said Capt. Heatlie's class.

In addition to this, the Home Government, anxious to make the Cape a greatly productive country, and feeder of British commerce, designed an extensive system of improvement in our agricultural, stock-rearing, and wool-shipping industries. Model farms were established. The most advanced methods were introduced. The finest breeds of horses, cattle, and sheep were introduced, and held at stud at many places, and every inducement was offered to the farmer to avail himself of the advantages liberally placed at his disposal. Experts were sent out to teach the farmer the most profitable methods and information was extensively published for dealing with the diseases of the animals, for the use of those who could not obtain professional help in good time or at reasonable cost.

IN SOMERSET'S TIME.

In 1814 Lord Charles Somerset assumed the reins of Government. He was a sportsman and a money-maker. He did a vast deal during the eight years that he was Viceroy at the Cape to stimulate agricultural pursuits and horse-breeding. He imported the finest stud stock, and that for racing purposes. He made the turf famous at the Cape, and perpetuated the passion for sport there which is so characteristic of the country to-day. Other men with means followed his example. All over the Western Province of the Colony there were good breeding centres. The Hantam, so favourable for the brood mare and her young, so free, open, healthy, undulating, and with warm kloofs into which to retire when desirable, rapidly increased its stock. Parts which are now known as Worcester and its back country, and all through to the Karoo northward ; the Berg River and the range of country on both sides of it going out westward ; and Caledon, with Swellendam, were at last alive with the presence of the noble steed. Such had the business become before Lord Somerset left, that in 1821 no less than 196 horses were shipped mostly to India, for military remounts by cavalry officers. The declared value was 56,980 rix dollars, which the then currency represented, an average of about £20 per head, or a total of £4,273. Thenceforward horse-breeding was a staple of the country, not only for local use, but for exportation to Mauritius and to India. The trade was largely increased and the breeds improved by the fact that, until the extinction of the East India Company's Charter took place (late in the fifties), the civil and military servants of that company had specially favorable priviliges offered to them to make the Cape the limit of their furlough. They came with riches and spent them freely. Their passion for British sports was well maintained. Many of them did South Africa the good turn of importing Arab stallions, and turning them to the most beneficial purposes in the land. One of these I saw from Oude, before the horrible

mutiny at Cawnpore. Others I remember well. A few days after my landing at Cape Town (in 1853), I went with a friend to see a pair of beautiful little black Arabs. They were a fine match for the carriage. One was suffering from inflammation in the head; he had to be trepanned; this operation was successful, and the noble animal recovered his pristine beauty of head and his brightness. Not least was a pair, behind which I often drove with their owner, who on one occasion for a wager, undertook to drive them from Cape Town to the Paarl—a distance of at least sixty miles—without a rest, to turn them round there, and bring them back, also without stopping except for Nature's purposes, without "turning a hair," in a given time. He won his wager.

FARMER HORSE-BREEDERS.

The Heatlies, their relations, the De Vos family, the Bredas, Van der Byls, and Chiappinis, the Hon. Mr. Reitz, Jan Linde, and Charles Manuel, Charles Berry, Martinus Melck and the Cloetes J. B. Bailey, the Jackson and Rose families (of Beaufort West), Jack Thomas, the late Mr. Thomas Heatlie, the Kotzes and J. B. Munnik, Mr. Theunissen, Mr. Meteler-kamp, and very many more, whose names I greatly regret having forgotten, did a vast deal to maintain the excellence of the breed of Cape horses by every means in their power.

In about 1856-8 a scourge appeared amongst the horses in Natal. Anthrax swept them away like chaff before the wind. It travelled along the littoral southward, and besides destroying 70,000 horses in the Cape Colony, it so completely sterilised some notable breeding areas, such as those along the Breede River, as to make them useless to this date. Among the permanent sufferers by that calamity was the father of State Secretary Reitz.

The exportation of horses to India and Mauritius became a nullity—the trade has long since ceased to exist. While it lasted I have seen beauties born and trained as cavalry remounts for officers ranging from £25 to £160 each. And my thoughts go sadly back to one horse, bought by a friend, and partly trained in the grounds about my residence, which was taken to India, and was one of the first victims of the Mutiny, being ridden by the adjutant and captain of the Jhansi Irregular Cavalry, who fell on that terrible occasion.

With the death of Mr. J. B. Bailey—an ex-Civil Servant of the Honourable East India Company—at Wynberg, the old sporting life of the Cape may be said to have begun to see its decay. The Cape was in sad straits. It was passing through a commercial crisis of long duration. Still, some men strove hard to battle against the unfavourable times. But these were too much for our country, and gradually, in spite of the endeavours of the Kotzes, Cloetes, Meleks, Bredas, Barrys, Van der Byls, and Charles Manuel, the sporting life of three-quarters of a century may be said to have passed into oblivion.

It is no purpose of mine to dwell upon the change which came over South African horse-breeding and racing after the success of the Diamond Fields, and the yet more affluent and influencing development of the Gold Fields. I will only add that the transformation of the financial state of the land from one of difficulty and of some desperation to such as the magician's wand brings forth could not fail to affect both the trade of the horse-breeder and the racing, if not the sportsman instincts of the lovers of the turf. The nature and character of the pursuits have changed. The old state of things has passed away, and the new is but a system which does not exalt the true sport in the eyes of those who love it for its own essential and, I consider, elevating charms.

Rome, July 16th, 1901.

Shropshire "Block" Tests.

AT the recent "block" test of Shropshire sheep carcases slaughtered from the Smithfield Club Show the following were the results:—

No. 398.—Shropshire wethers, first prize in class and winners of the breed cup; bred and exhibited by P. L. Mills; age, 21 months; live weight, 7 cwts. 17 lbs. the pen of three; average daily gain of live weight, 0.42lbs.; average weight of dressed carcase, 179 lbs. (185 lbs., 182 lbs., and 171 lbs.); average percentage of carcase to gross live weight, 67.04. Slaughtered by E. Diggins, 5, Chapel Street, Somers Town.

Pound Notices.

THE stock impounded as hereunder will be sold, unless previously released, on the 2nd April next :—

Estcourt.—Red heifer, white on udder, branded left hind leg $\overset{|}{O}$. Brown brindle heifer, branded on left hind leg blotch or O or $\overset{|}{O}$. Black heifer, small round horns, star on forehead, white belly, half white tail. Impounded by R. C. Brown, Brakfontein. Bay gelding, black points, age about 3 years, no brands. Chestnut gelding, age about 3 years, no brands. Both impounded by Native Umdabula, residing on Location Thaba Umshlopo.

Howick.—On the farm Blesberg, two wethers, notch in each side of left ear. Two ewes, notch in each side of left ear and bottom of right ear. One ewe, notch in each side of left ear. All marked indistinctly C or G in red on rump, and are unclipped.

Impendhle.—Bay yearling colt, white face, four white feet, long tail, no brands.

Boston.—Small black cow, a few white hairs on forehead, white patch between fore legs, and a little white half way down tail, branded on off hind leg L D, and near hind leg Y.

Dronk Vlei.—Red and white ox, age one year, no brands, tips of both ears cut off.

Nqutu.—Red and white ox, branded IC right hip.

Nkandhla.—Cream-coloured mare, long tail and mane, no brand marks; black colt foal at foot. Light bay mare, long tail and mane, branded UF (joined) on right flank; dark bay foal at foot. Bay mare, sore back, short tail, very old, no brand marks. Bay horse, long tail, small star on forehead, no brand marks. Bay mare, long tail, black points; bay foal at foot. Dark bay mare, white on off hind foot, long tail and mane; black foal at foot. Light bay mare, black points, long tail and mane; bay foal at foot. Bay horse, two hind feet white, swollen off front knee, long tail, cut in right ear. Bay horse, cut both ears, long tail and mane, black points. Bay horse, long tail and mane, dark points, about 18 months old. Bay horse, long tail and mane, about 12 months old. Bay mare, long tail, white forehead, branded T F right side; light bay foal at foot. Bay horse, long tail, top of right ear cut off. Bay mare, long tail and mane, branded N L right side, cut right ear, star on forehead; bay foal at foot. Dark bay horse, black points, cut right ear. Dark bay mare, long tail and mane, top right ear cut off.

Byrne.—On the form "Cottingham," black ox, branded V on buttock.

Ladysmith.—On the farm "Mount Maria," Chestnut mare, with grey mane and tail, stripe down face, and four white feet, branded GJ on right shoulder, middle-aged.

On the farm "Krantz Kloof."—Two-year-old black heifer, branded on right side of rump $\mathfrak{D}$ and on left G. Kafir she goat, colour blue.

On the farm "Platberg," and too wild to drive to Pound:—Red cow and calf, cow branded BJ or BF.

Mooi River.—Blue-and-white bull, two years old, long tail, white brush, no brands or marks; probable value, £8.

Will be sold one month from date (22nd February), if not previously released. Impounded by Mr. J. Van der Westhuysen, South Meshlyn.

The stock impounded hereunder will be sold, unless previously released, on the 18th March next :—

Springfield.—On the farm "Vaalbank," and reported by Mr. G. J. Van der Merwe:—Three-year-old bay filly, long tail, star on forehead, no brands visible. Probable value £6.

Impendhle.—Black ox, swallow tail

Eshowe.—The black ox in the Eshowe Pound, advertised to be sold on the 4th March, has been destroyed in terms of Section 30 of Act No. 30, 1897, "The Lungsickness Prevention Act."

Meteorological Returns.

Meteorological Observations taken at Government Stations for Month of January, 1902.

STATIONS	TEMPERATURE (In Fahr. Degrees).				RAINFALL (in inches).					
	Means for Month.		Maximum for Month.	Minimum for Month.	Total for Month.	No. of Days.	Heaviest rainfall in one day.		Total for Year from July 1st, 1901.	Total for same period from July, 1st, 1900.
	Maximum.	Minimum.					Fall.	Day.		
Observatory	82·7	66 5	92·1	56 4	6·35	23	2·04	30th	31 87	21·58
Stanger...	83·9	64·6	104	59	7·18	25	2·68	29th	31·04	23·92
Verulam	86·4	67·3	100	61	5·61	19	2·38	30th	27·09	23·83
Greytown	85·9	61·2	95	56	5·80	20	·95	30th	27 14	...
Newcastle	94·8	69·0	103	81	4·61	10	2·15	24th	22.34	22 06
Estcourt	85·2	58·6	98	53	5·60	16	1·00	23-26	19·56	19·32
Port Shepstone ...	82·3	65·6	89	57	4 68	17	1·30	30th	35 64	21·23
Umzinto	81·6	61·8	90	60	4 56	15	1·55	30th	24 72	17·94
Richmond ...	76·5	59·4	93	53	5·07	24	·61	29th	25·30	20·75
Maritzburg ...	81·7	6 ·0	98	54	4 90	20	69	25th	20 85	17·15
Howick...	80·1	58·3	97	51	4·22	22	·77	26th	20 46	13·08
Ladysmith	90·0	61·0	106	44	3·81	10	1·65	25th	...	...
Dundee	83·9	57·9	98	52	6 53	7	2·90	25th	25·54	...
Weenen	92·3	60 6	105	56	4·55	13	1 26	29th	16·90	17·81
New Hanover	85·3	59 6	101	53	4·83	23	1·15	26th	23·47	17 63
Hillcrest	73·7	61·3	90	53	6 58	25	1·43	30th	29·18	20 54
Mapumulo	85·9	60·3	101	42	5·80	17	1·60	30th	28·45	19·94
Nongoma	79·5	60·7	96	57	12·71	11	4·90	27th	28·89	...
N'Kandhla	75·0	57·9	94	50	4 25	16	1·08	26th	...	...
Qudeni	72·3	52·9	89	46	9·84	24	1·72	26th	39·65	...
Umlalazi	85·5	70·5	103	51	6·60	8	1·80	10th	...	...
Hlabisa	81·0	62 5	97	58	7 10	14	1·40	26th	27·70	...
Melmoth	81·7	61·5	101	56	5 44	18	1·02	26th	22 46	20·18
Eshowe	77·9	62·5	98	57	9·48	18	1·80	30th	38·96	31·54
Nqutu	73·3	58·9	89	51	5·53	22	2 42	25th	...	...
Lower Tugela... ...	84·4	65·7	102	61	5·90	16	2·17	30th	...	...
Point	...		...	...	3 99	14	1·16	29th	20 09	15·22
South Coast Junction	...	...		...	6·78	24	2·27	30th	31 72	...

Market Reports.

(Responsibility for the accuracy of the Statements and Opinions of the following Reports rests with the respective contributors.)

MARITZBURG.—Messrs. W. H. Walker and Co. write:—During the past fortnight we have experienced real summer heat, although trying to residents in the City; farmers assure us that the heat has developed the crops to such an extent, that if the weather continues favourable for a few weeks longer, there is every indication of a record crop. This applies more particular to mealies. One hears of the usual grumble against the block on the railway, but the Commission appointed to investigate have practically exonerated the managers of our railway.

Mealies.—The average price is about 11s. 6d. per muid.

Forage.—Some splendid offered almost every day at prices varying between 3s. 8d. to 8s. per 100 lbs.

Hay.—Prices are high for the time of the year. Whilst some samples have been down to 1s. 9d. per 100 lbs., others have reached 2s. 9d., 2s. 11d., and 3s. 6d. per 100 lbs.; bedding from 16s. to 19s. 6d. per 100 lbs.

Potatoes.—Market well supplied, and prices have been everything between 3s. 3d. and 10s. per 100 lbs.

Mabele.—Still rules high, notwithstanding the fact that the weevils are playing havoc with the grain; prices have ruled between 7s. 6d. and 9s. 6d. per 100 lbs,

Beans.—From 6s. to 11s. per 100 lbs.

Tobacco.—From 10d. to 1s. per lb.

Onions.—Market well supplied, and prices ranged between 6s. 6d. and 14s. per 100 lbs.

Pumpkins.—From 1s. 9d. to 5s. per doz.

Poultry.—Common fowls from 2s 1d. to 4s. 3d. each; ducks from 5s. 3d. to 10s. 3d. per pair; turkeys, from 12s. 9d. to 18s. 6d. each.

Eggs.—From 1s. 9d. to 3s. 11d. per doz.

Butter.—From 9d. to 2s. 2d. per lb.

Fruit.—Abundance of fruit coming forward daily, comprising apples, bananas, grapes, grenadillas, lemons, pineapples, plums, peaches, and papaws.

Vegetables—Beans, beetroot, cabbages, cucumbers, lettuce, marrows, rhubarb, turnips, and tomatoes.

Sundries.—Mutton, from 4d. to 9d. per lb; pork, from 3½d. to 10½d. per lb.; beef, 4½d. to 6d. per lb.

Firewood.—From 6d. to 10½d per 100 lbs.

DURBAN.—Mr. W. H. Edmonds, Box 44, writes:—

General.—Trade continues bad, and things generally have not been so slack since the war commenced.

Mealies.—This staple is in poor demand, and with weevil forcing holders to part it hardly looks as if any marked improvement were possible. Prices locally to day run about 12s. per muid, with 6d. better for up-country grain. The extraordinary and continued heat is commencing to affect the growing crops, and unless rain falls soon, conditions may very quickly be altered as regards the market.

Potatoes.—A slight imp ovement is manifest, and rates for good samples run about 10s. per muid. With the disappearance of the imported article a better demand may be confidently anticipated, and farmers will probably realise the advantage any time next month.

Hay.—New season's growth is now putting in an appearance, and a big demand may be looked for this year.

Oats.—"Algerian" seed is greatly in request, and this grand oat will go far towards reconciling the farmer to his bad luck of late years. The writer knows of farmers who last season planted two or three bags, are putting in twenty this year. This is as it should be, and within a couple of seasons, it is more than possible, imported fodders will be merely a memory.

J. RAW & CO.'S SALES.

During this month Messrs. J. Raw and Co., auctioneers, have conducted stock fairs at Mooi River, Nottingham Road, and Seven Oaks, a good number of cattle being forward at each.

At Mooi River on the 12th February prices were as follows:—Wethers 25s 6d, 22s 6d, 26s 6d, 26s each; fat cows, £13, £15, and £17 per head; trek oxen, £15 10s, £17, and £19 per head; cows, £13 10s; young bull, £10; itoles, £10 and £10 10s. Total amount of sale, £602.

The Nottingham Road Stock Fair, held on the 19th instant, was a record sale. Prices were:- For wethers 21s, 26s, 20s, 20s 3d, 25s, 21s 6d each; rams, 10s, 17s 6d, 19s, 13s 6d, 27s 6d each; mixed sheep, 11s each; 2-year old Devon bull, £20; trek and fat oxen, £20, £16, £19, £18, £17, £18 10s, £20 10s, £21 per head; cows, £20 5s, £20 15s, £17 10s, £15 10s, £8, £14, £18, £13, £15, £6, £11 12s 6d, £12 each; cows with calves, £16, £17 10s, £17 15s, £10 each; young oxen, £11, £10 15s, £10 7s 6d; heifers, £17; bull, £5 10s; horses: Stallion "Supreme," 36 guineas; others at 37½ guineas pair, and 20 guineas, 17 guineas, 12½ guineas, 15½ guineas, 10 guineas each; mules, 12 guineas each; wagon and gear, £40; buggies, £35 each; horse hay rake, £5. Total amount of sale, £2,409.

The Seven Oaks Farmers' Association held their Stock Fair at Seven Oaks on the 25th instant. Plenty of cattle forward, but a good number were unsold. Prices were:—Fat and trek oxen, £17, £15, £10, £24, £17, £15, £19, £21, £16, £17 per head; cows, £10; cow and calf, £15 10s.; young oxen, £11; young bull, £8 10s. Total amount of sale, £469.

At the sale of stock, etc., held at York on the 20th instant, on account of the estate of the late Mrs. E. Demont, prices ruled as follows:—

Cows with calves, £18, £20 10s, £14, £19, £22, £21, £20, £20, £25, £26, £13 10s, £26 10s, £27 each; cows, £20, £25, £22, £10 5s, £14 10s, £20 5s, £17 10s, £17, £15, £10, £19, £24 each; heifers, £15 10s, £18, £17 10s, £13 each; young bull, £19; young oxen, £13, £13 10s; oxen, £16 10s, £15 10s, £16, £18, £19, £14 per head. Other cattle at the same sale realised:—Young oxen, £12 10s per head; cow, £25; horse, 18½ guineas.

The National Stud Farm in Hungary is the largest in the world, and the annual amount spent is £116,000. In Austria there are stud farms that cost £120,000, and an annual appropriation of £40,000 for importing thoroughbred horses from other countries. The fees charged to farmers vary from 1s. 8d. to 16s. 8d., and the total amount received for fees amounts to £30,000 per annum, and also £60,000 awarded in premiums for privately owned stallions. In India about 300 stallions are kept by the Government, and their services are given free to selected mares. In England the Government give £5,000 annually in fees and prizes for approved stallions, and also spend enormous sums in buying remounts for the army.

Mr. Ford describing the muleteer's train of pack mules in Spain, says:—"The leading animal is furnished with a copper bell, having a wooden clapper, to give notice of their march. The bell is shaped like an ice-mould, is sometimes 2 ft. long, and hangs from the neck, being contrived, as it would seem, to knock the mule's knees as much as possible, and to emit the greatest quantity of melancholy sounds, which, according to the pious origin of all bells, were meant to scare away the Evil One. The bearer of all this tintinnabular clatter is chosen for his superior docility, and his knack in picking a way. The others follow the leader, and are guided by the sound of his bell when they cannot see him.