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# Durban Botanic Society.

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## REPORT

ON

## NATAL BOTANIC GARDENS

FOR THE

YEAR 1894,

BY

**J. MEDLEY WOOD, A.L.S.,**

*Corresponding Member of the Pharmaceutical Society of  
Great Britain,*

**CURATOR.**

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DURBAN :  
NATAL MERCURY STEAM PRINTING WORKS.

1895.



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209  
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# DURBAN BOTANIC SOCIETY.

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COMMITTEE, 1894.

President :

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Hon. Treasurer :

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Curator :

J. MEDLEY WOOD, A.L.S.



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# REPORT.



BOTANIC GARDENS,

JANUARY, 1895.

TO THE PRESIDENT AND COMMITTEE,  
DURBAN BOTANIC SOCIETY.

GENTLEMEN,

Once more I am pleased to have to record the occurrence of a very favourable season. Rains have been frequent and fairly plentiful, and we have not during any part of the year suffered seriously from drought. The meteorological observations taken at the Observatory in the N.W. corner of the Gardens have been kindly supplied by the Government Astronomer, and are attached to this Report.

It was stated in my report for last year that the native and Indian houses required attention, and I am glad to be able to say that substantial buildings have now been erected of brick, with galvanised iron roofs. The Kafir-house is in the upper part of the ground, above the Herbarium and Store-room, which has been found the most convenient site, and it is quite large enough to accommodate all the natives we shall be likely to employ for many years to come. The Indian quarters are in the lower or S.W. corner of the ground, near St. Thomas' Road, and here a building has been erected also of brick with iron roof, which accommodates about half of the men with their families. Another building of similar size and character will have to be erected as soon as circumstances will admit of it, and then the accommodation for our coloured labourers will be complete.

The next work to be undertaken will, I would suggest, be a new Conservatory, and I hope that during the present year this may be commenced. The present building is not nearly large enough to contain our stock of plants, which is constantly on the increase, and is in want of repairs, which cannot well be undertaken without removing the plants. The site of the old store seems to me to be the most suitable place for the new building, and it would, I think, be advisable to erect it in three sections, the central house to be erected as soon as convenient, and the two wings as soon as circumstances will allow, and I hope in my next report to have to chronicle the completion of the first section of this work.

The piece of land along the Sydenham Road boundary which has been cleared, as stated in my last report, has now been nearly all planted, and a list of the plants put out will be found in this report. I intend as soon as possible to have another piece cleared at the lower end of the ground, and I hope that it will be ready for planting during next season.

At the commencement of the year arrangements were made to connect the Gardens with the Town by telephone, and this has often been found a great convenience, though the cost is somewhat heavy.

An order was sent home early in the year for flower pots, which were duly received, but in spite of care and special methods of packing, the losses by breakage were very great. There seems now to be a prospect of obtaining good pots locally made, the sample already sent to us being of excellent quality, and the price reasonable.

The plant labels hitherto used have not been found quite satisfactory, the lettering soon becomes illegible, and they are frequently broken by visitors. A trial order has therefore been sent home for a gross of iron labels, enamelled with black letters on a white ground. The lettering is, judging by the sample received, very conspicuous, and the enamel will stand any fair usage, as it does not chip off even with a smart blow. As these labels are somewhat expensive, it is to be hoped that mischievous persons will not attempt to damage them.

During the early part of the year I took a trip with wagon and oxen to the district beyond Greytown, proceeding over the Noodsberg, and made fair collections of plants for the Gardens, and for exchange with other institutions. Shorter trips were made, but chiefly for collecting specimens for the Colonial Herbarium and for exchange, as detailed in my Report on Herbarium matters.

The European staff at the Gardens remains unchanged, and consists of Mr. J. Wylie, the head gardener; Mr. Harmon and Mr. Rutter, assistants; and I have much pleasure in again testifying to their zeal and industry.

Plants, fruit, flowers, &c., have been sold, sent away in exchange, and granted free to public institutions to the amount of upwards of £1100.

Packets of seeds were received during the year as follows :—

	PACKETS.
Royal Botanic Gardens, Kew ... ..	46
"    "    "    Jamaica ... ..	10
"    "    "    Mauritius ... ..	9
Botanic Gardens, Bangalore ... ..	7
"    "    Madras ... ..	20
"    "    Melbourne ... ..	73
"    "    Paris ... ..	9
"    "    Saharunpur ... ..	19
"    "    St. Petersburg ... ..	72
"    "    Trinidad ... ..	1
University of California ... ..	23
Acclimatisation Society, S. California ... ..	15

Carried forward ... 304

				PACKETS.
Brought forward				... 304
Australian Department of Agriculture	...	...	...	27
Adlam, R. W., Transvaal	...	...	...	1
Airth, Capt., Bellair	...	...	...	1
Allison, Capt., Natal	...	...	...	2
Brooks, H., Natal	...	...	...	3
Bull, W., London	...	...	...	1
Buysman, M.	...	...	...	2
Damman & Co., Naples	...	...	...	151
Espeut, H. B.	...	...	...	4
Evans, M. S., Durban	...	...	...	8
Fradd, C. R., Durban	...	...	...	1
Harvey, J. C., U. S. America	...	...	...	31
Hillary, G., Natal	...	...	...	1
Holmes, E. M., London	...	...	...	2
Jameson, R., Durban	...	...	...	12
Leichtlin, Max, Baden-Baden	...	...	...	1
Lloyd, Mrs. B. P., Natal	...	...	...	3
Macowan, Prof., Capetown	...	...	...	2
Marshall, J., Natal	...	...	...	2
Mueller, Baron F. v., Australia	...	...	...	36
Nicholson, W., Natal	..	...	...	1
Norman, Dr. H. H.	...	...	...	3
Reasoner Bros., Florida	...	...	...	41
Saunders, Mrs., Natal	...	...	...	1
Schlechter, R., Capetown	...	...	...	2
Schultz, Mrs., Natal	...	...	...	2
Thompson, Dr., Gazaland	...	...	...	21
Whyte A., England	..	...	...	2
Wilkinson, A., Natal...	...	...	...	1

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 669

The following plants were received :—

H. B. Espeut	...	...	...	...	4 plants of 1 species
Agri-Horticultural Soc. of India	...	65	..	65	..
Botanic Gardens, Melbourne	...	53	..	48	..
.. .. Saharunpur	...	12	..	1	..
Sander & Co., London	...	40	..	33	..

The above-named seeds and plants will be reported on next year.

During 1893 we received 109 plants and 779 packets of seeds, as stated in my last Report, which resulted as follows :—

PLANTS.

Dead on arrival	...	...	...	...	10
Died afterwards from effects of voyage	...	...	...	...	8
Planted in Gardens	...	...	...	...	28
In pots (including orchids)	...	...	...	...	56
Already in stock	..	...	...	...	7

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 109

## SEEDS.

Failed to germinate ... ..	236
Germinated, but died afterwards ... ..	70
Distributed ... ..	87
In stock ... ..	149
Still in Pots, or planted in Gardens ... ..	201
Annuals and Weeds ... ..	36

779

We have sent away during the year packages of plants, as under :

Royal Botanic Gardens, Kew ... ..	1 Wardian case
" " " " ... ..	6 boxes by post
Botanic Gardens, Melbourne ... ..	1 Wardian case
Agri-Horticultural Society, Calcutta ... ..	2 Wardian cases
" " " " ... ..	1 box by post
H. Strauss, Germany ... ..	1 case
Prof. Schinz, Zurich ... ..	2 boxes by post
Max Leichtlin, Baden-Baden ... ..	1 box by post
H. M. Arderne, Capetown ... ..	1 "

And the following seeds :

Royal Botanic Gardens, Singapore ... ..	24 packets
" " Jamaica ... ..	24 "
Botanic Gardens, Saharunpur ... ..	24 "
" Brisbane ... ..	24 "

and 350 packets of seeds to various correspondents abroad, while numbers of packets of seeds of useful plants have been given to Missionaries and others proceeding to the interior.

The following publications have been received :—

Report Royal Botanic Gardens, Calcutta ... ..	from Director
" " " Ceylon ... ..	" "
" Botanic Gardens and Forest Department, Hong-Kong ... ..	" "
" Botanic Gardens and Forest Department, Singapore ... ..	" "
" Imperial Botanic Gardens, Berlin ... ..	" "
" Botanic Gardens, Graaff-Reinet ... ..	from Curator
" " Maritzburg ... ..	" Committee
" " Nova Scotia ... ..	from Director
" " Saharunpur ... ..	" "
Bulletin, Royal Gardens, Kew ... ..	" "
" " Jamaica ... ..	" "
" Botanic Gardens, St. Vincent ... ..	Supt.
Proceedings Agri.-Horticultural Society, Madras ... ..	Committee
" " " of India ... ..	" "
Journal of Pharmaceutical Society ... ..	" "
Kew Guide to Museum No. 3 ... ..	Director
Experiment Station Record ... ..	U.S. Govt.
Diseases of Sugar Canes, by C. A. Barber ... ..	Kew
Investigation of Californian Olives and Olive Oil ... ..	University of California

Non-indigenous species of the Andaman Islands, by Dr. D. Prain ... ..	Author
Remarks on Fauna of Narcondam and Barren Island, by Dr. D. Prain ... ..	" "
Present condition of Barren Island, by Dr. Prain ...	" "
Laboratory Report, by E. Mercke, Use of Spray Pump ... ..	Prof. Macowan
Reconstruction of Phylloxerised Vineyards, by J. F. Marais ... ..	" "
Ensilage, by A. C. Macdonald ... ..	" "
Cultivation of Tobacco, by R. Schenck ... ..	" "
Tobacco Culture ... ..	" "
Fermentation of Wine, by G. Payne ... ..	" "
Insect and Fungus Pests, by G. R. Deare ... ..	Purchased
Natal Farmers' Magazine ... ..	"
Tropical Agriculturist ... ..	"

The following plants have flowered or fruited in the Gardens for the first time during the year :—

<i>Acacia retinodes</i> ... ..	Australia ...	Damman & Co.
<i>Andira inermis</i> ... ..	W. Indies ...	Jamaica Bot. Gardens.
<i>Anguloa Clowesii</i> ... ..	Colombia ...	Sander & Co.
<i>Boltonia cantonensis</i> ...	China ...	St. Petersburg.
<i>Calotropis procera</i> ... ..	Persia ...	Kew.
<i>Cattleya amethystoglossa</i>	Brazil ...	Sander & Co.
<i>labiata</i> var. <i>autumnalis</i>	S. America ...	"
<i>Clerodendron macrosiphon</i>	?	"
<i>Clusia alba</i> ... ..	S. America ...	Mauritius.
<i>Crescentia cujete</i> ... ..	Jamaica ...	Mr. Colepepper.
<i>Crinum subcarnuum</i> ... ..	E. Africa ...	J. Wilson.
<i>Cypripedium Crossianum</i>	Hybrid ...	Sander & Co.
var. <i>psittacus</i> ... ..	" ...	"
<i>venustum</i> ... ..	Nepal ...	"
<i>Dendrobium crassinode</i>		
var. ... ..	Ariacan ...	"
<i>Leechianum</i> ... ..	Hybrid ...	"
<i>Epidendrum Godseffianum</i>	S. America ...	"
<i>Gladiolus aurantiacus</i> var.	Natal ...	Collected.
<i>sp.</i> ... ..	Delagoa Bay ...	Capt. Turner.
<i>Hymenocallis expansa</i> ...	W. Indies ...	J. O'Brien.
<i>Impatiens Roylei</i> ... ..	India ...	St. Petersburg.
<i>scabrida</i> ... ..	Himalayas ...	"
<i>Kniphofia Woodii</i> ... ..	Natal ...	Collected.
<i>Lobelia Kernerii</i> ... ..	Costa Rica ...	Damman & Co.
<i>Marica Northiana</i> ... ..	Brazil ...	Sander & Co.
<i>Nepenthes Rafflesiana</i> ...	Singapore ...	W. Bull.
<i>Oncidium bi-color</i> ... ..	Brazil ...	Sander & Co.
<i>phymatochilon</i> ... ..	" ...	"
<i>violaceum</i> ... ..	" ...	"
<i>Phyllarthron comorense</i> ...	?	Kew.
<i>Physalis hirsuta</i> ... ..	Brazil ...	St. Petersburg.

<i>Quillaja saponaria</i> ...	Chili ...	...	Kew.
<i>Richardia hastata</i> var. ...	Natal ...	...	J. Marshall.
" <i>Rehmannii</i> ...	" ...	...	"
<i>Rhodomyrtus tomentosa</i>	China ...	...	Reasoner Bros.
<i>Sedum formosianum</i> ...	?		Hong Kong.
<i>Solanum Wendlandii</i> ...	Costa Rica ...		Kew.
<i>Strychnos nux vomica</i> ...	India ...	...	?

The following have been planted in the Gardens during the year :—

<i>Acacia auriculiformis</i> , A.			
<i>Cunn</i> ...	Leguminosæ ...		Australia.
" <i>adrialiformis</i> , ?	"		?
" <i>cavenia</i> , Hook			
"    " <i>Espino</i> " ...	"		Chili.
" <i>cornigera</i> , ? ...	"		N. America.
" <i>eburnea</i> , Willd. ...	"		India.
" <i>holosericea</i> , A.			Australia.
<i>Cunn</i> ...	"		
" <i>latifolia</i> , Bth. ...	"		N. Australia.
" <i>leucantha</i> ...	"		?
" <i>longifolia</i> , Willd.	"		S. E. Australia.
"    " <i>var. sophoreæ</i> , R. B. ...	"		
" <i>pendula</i> , Cunn. ...	"		N. S. Wales, &c.
" <i>pentadenia</i> , Lindl.	"		W. Australia.
" <i>podalyriæfolia</i> , A.			
<i>Cunn</i> ...	"		Australia.
" <i>retinodes</i> , Schl. ...	"		S. E. Australia.
" <i>spectabilis</i> , A.			
<i>Cunn</i> ...	"		Australia.
" <i>strombolifera</i> , ?	"		Peru.
" <i>sp.</i> ...	"		?
<i>Abroma augusta</i> , Linn. ...	Sterculiaceæ ...		E. Indies.
<i>Albizzia amara</i> , Bow ...	Leguminosæ ...		Abyssinia, India, &c.
<i>Alchornea ilicifolia</i> , Muell			
<i>Arg.</i> ...	Euphorbiaceæ		Australia.
<i>Apios tuberosa</i> ...	Leguminosæ ...		N. America.
<i>Aralia Chabrieri</i> ...	Araliaceæ ...		?
<i>Allamanda magnifica</i> ...	Apocynææ ...		?
"    " <i>Williamsii</i> ...	"		
<i>Archonto phœnix</i> Cunn-			
"    "    " <i>inghamiana</i> , W. D.	Palmae ...		Queensland.
<i>Areca sp.</i> ...	"		?
<i>Bauhinia picta</i> , ?	Leguminosæ ...		
<i>Benthamia fragifera</i> , Ldl.	Cornaceæ ...		E. Indies.
<i>Boehmeria argentea</i> ...	Urticaceæ ...		China.
<i>Calamus</i> , <i>sp.</i> ...	Palmae ...		Andaman.
<i>Callicarpa purpurea</i> ...	Verbenaceæ ...		India.
<i>Calotropis procera</i> ...	Asclepiadeæ ...		Persia.
<i>Cassipourea verticillata</i> ,			
<i>N.E.B</i> ...	Rhizophoreæ ...		Natal.

<i>Caryota Rumphiana</i> , Mart.	Palmæ...	...	Moluccas.
„ <i>urens</i> , Linn	„ ...	...	E. Indies.
<i>Casuarina humilis</i> , Ott & Dietr.	...	Casuarineæ ...	W. Australia.
<i>Catalpa Koempferi</i> , Sieb. & Zucc.	...	Bignoniaceæ ...	Japan.
<i>Celtis sinensis</i> , Persoon	...	Urticacæ ...	China.
<i>Chamærops humilis</i> , Linn	...	Palmæ...	S. Europe.
<i>Chrysobalanus icaço</i>	...	Rosacæ ...	Florida.
<i>Chrysophyllum camito</i> , Linn	...	Sapotacæ ...	W. Indies.
<i>Cinchona hybrida</i>	...	Rubiaceæ ...	
<i>Clerodendron inerme</i>	...	Verbenacæ ...	
„ <i>macrosiphon</i>	...	„ ...	
„ <i>speciosum</i>	...	„ ...	China.
„ <i>tomentosum</i> , R. Br.	...	„ ...	Australia.
<i>Clusia rosea</i>	...	Guttifereæ ...	Carolina.
<i>Coccoloba uvifera</i>	...	Polygonacæ ...	W. Indies.
<i>Cocos australis</i> , Mart.	...	Palmæ...	Brazil.
„ <i>campestris</i> , Mart....	...	„ ...	„
„ <i>Wedelliana</i> , Wendl.	...	„ ...	„
<i>Cycas revoluta</i> , Thb.	...	Cycadacæ ...	Japan.
„ <i>Seemanii</i>	...	„ ...	
<i>Cytisus proliferus</i>	...	Leguminosæ ...	Canaries.
<i>Dacrydium cupressinum</i> , Solan	...	Conifereæ ...	New Zealand.
<i>Dasyliion Wheeleri</i>	...	Bromeliacæ ...	
„ <i>sp.</i>	...	„ ...	
<i>Deutzia</i> , <i>sp.</i>	...	Saxifrageæ ...	
<i>Didymospermum porphyrocarpon</i> , W.D.	...	Palmæ...	Java.
<i>Diervillea</i> ( <i>Weigelia rosea</i> )	...	Caprifoliacæ...	China.
<i>Dypsis madagascariensis</i> , Hert.	...	Palmæ...	Madagascar.
<i>Ehretia serrata</i> , Roxb.	...	Boragineæ ...	E. Indies.
<i>Elaeodendron quadrangulatum</i>	...	Celastrineæ ...	
<i>Epipremnum mirabile</i>	...	Aroideæ ...	
<i>Ficus Cannoni</i>	...	Urticacæ ...	
„ <i>eburnea</i> , Ldl.	...	„ ...	Brazil.
„ <i>glomerata</i> , Miller...	...	„ ...	Australia.
„ <i>longifolia</i> , Schott ...	...	„ ...	E. Indies.
<i>Garcinia indica</i> , Chois....	...	Guttifereæ ...	„
<i>Geonoma gracilis</i> , Wendl.	...	Palmæ...	Costa Rica.
<i>Gleditschia sinensis</i> , Lam.	...	Leguminosæ ...	China.
<i>Gnetum gnemon</i> , Linn....	...	Gnetacæ ...	E. Indies.
<i>Hedychium capitatum</i>	...	Scitamineæ ...	„
„ <i>sp.</i>	...	„ ...	„
<i>Hedyscepe Canterburyana</i> , W. & D.	...	Palmæ...	Lord Howe's Island.

<i>Heritiera fomes</i> , Buch. ...	Sterculiaceæ ...	
" <i>macrophylla</i> ...	"    ... ..	
<i>Hibiscus grandiflorus</i> ...	Malvaceæ ...	Georgia.
" <i>incanus</i> ...	"    ... ..	Carolina.
" <i>luteus</i> ... ..	"    ... ..	
<i>Howea Balmoreana</i> , Becc.	Palmae... ..	Lord Howe's Island.
" <i>Fosteriana</i> "	"    ... ..	"    "
<i>Inula cuspidata</i> ... ..	Compositæ ...	
<i>Ipomœa</i> , sp. ... ..	Convolvulaceæ	Guatemala.
<i>Karatas Plumieri</i> ... ..	Bromeliaceæ ...	W. Indies.
<i>Kirkia acuminata</i> ... ..	Simarubeæ ...	Transvaal.
<i>Kniphofia Woodii</i> , Baker		Natal.
<i>Latania Verschaffeltii</i> ,		
Linn ... ..	Palmae... ..	Roderiguez.
<i>Leea coccinea</i> ... ..	Ampelideæ ...	Trop. Asia.
<i>Liquidambar styraciflua</i> ,		
Linn ... ..	Hamamelideæ	Central America..
<i>Livistona australis</i> , Mart.	Palmae... ..	E. Australia.
" <i>rotundifolia</i> , "	"    ... ..	Moluccas, &c.
<i>Lobelia Kernerii</i> ... ..		
<i>Macrozamia Miquellii</i> , F.		
v. M. ... ..	Cycadeæ ...	Queensland.
" <i>Perowskiana</i> , Mig.	"    ... ..	"
" <i>spiralis</i> , Miquellii	"    ... ..	"
<i>Mallotus japonicus</i> ... ..	Euphorbiaceæ	
<i>Manihot palmata</i> ... ..	"    ... ..	
<i>Marica Northiana</i> , Ker.	Irideæ ...	Brazil.
<i>Melaleuca genestifolia</i> , Sm.	Myrtaceæ ...	Australia.
<i>Melia azedarach</i> , var. <i>um-</i>		
<i>braculifera</i> ... ..	Meliaceæ ...	
<i>Melothria Regelii</i> ... ..	Cucurbitaceæ... ..	
<i>Mimusops parviflora</i> ... ..	Sapotaceæ ...	New Holland..
<i>Monetia barlerioides</i> ,		
L'Herit. ... ..	Ilicineæ ...	E. Indies.
<i>Myristica surinamensis</i>	Myristiceæ ...	
<i>Nerium rubrum plenum</i>	Apocynaceæ ...	
"    sp. ( <i>crimson</i> ) ... ..	"    ... ..	
"    sp. ( <i>variegated</i> ) ... ..	"    ... ..	
<i>Ochna multiflora</i> ... ..	Ochnaceæ ...	
<i>Ochrosia elliptica</i> , Labill.	Apocynaceæ ...	Queensland..
<i>Oenocarpus Bacaba</i> , Mart.	Palmae ...	Rio Negro.
<i>Oroxylum indicum</i> , Vent.	Bignoniaceæ ...	E. Indies.
<i>Parkia Roxburgii</i> , G. Don	Leguminosæ ...	E. Indies.
<i>Phœnix canariensis</i> ,		
Naud. ... ..	Palmae ...	Canaries.
<i>Phyllanthus intermedius</i>	Euphorbiaceæ	
<i>Phyllarthron comorense</i> ...	Bignoniaceæ ...	
<i>Piscidia erythrina</i> ... ..	Leguminosæ ...	W. Indies.
<i>Pistacia lentiscus</i> , Linn...	Anacardiaceæ	S. Europe.
<i>Pithecolobium bigeminum</i> ,		
Bth. ... ..	Leguminosæ ...	E. Indies.

<i>Podocarpus dacrydioides</i> , Rich. ... ..	Coniferæ ...	New Zealand.
" <i>Totara</i> , Dön. ... ..	" ...	"
<i>Prosopis spicigera</i> ... ..	Leguminosæ ...	Coromandel.
<i>Punica granatum</i> , Linn, var. ... ..	Myrtaceæ ...	S. Europe.
<i>Pyrethrum cinerariæfolium</i> ... ..	Compositæ ...	Dalmatia.
<i>Raphiolepis indica</i> ... ..	Rosaceæ ...	China.
<i>Ravenala elegans</i> ... ..	Scitamineæ ...	
" <i>guianensis</i> ... ..	" ...	S. America.
<i>Salvadora persica</i> , Linn... ..	Salvadoraceæ ...	India.
<i>Sambucus racemosa</i> ... ..	Caprifoliaceæ ...	S. Europe.
<i>Sapota sideroxylon</i> ... ..	Sapotaceæ ...	
<i>Sarcocephalus cordatus</i> , Mig. ... ..	Rubiaceæ ...	India.
<i>Solanum Wendlandii</i> ... ..	Solanaceæ ...	Costa Rica.
<i>Spartium junceum</i> ... ..	Leguminosæ ...	Canaries.
<i>Sterculia acerifolia</i> , A. Cunn. ... ..	Sterculiaceæ ...	Australia.
" <i>elata</i> , Roxb. ... ..	" ...	India.
" <i>heterophylla</i> ... ..	" ...	
<i>Strophanthus hispidus</i> ... ..	Apocynaceæ ...	E. Africa.
<i>Tacsonia</i> , Von Volxemi Funcke ... ..	Passifloreæ ...	New Granada.
<i>Tecoma Smithii</i> ... ..	Bignoniaceæ ...	
<i>Terminalia tomentosa</i> , W. & A. ... ..	Combretaceæ ...	India.
<i>Thrinax radiata</i> , Lodd... ..	Palmæ ...	W. Indies.
<i>Veronica</i> , sp. ... ..	Scrophulariaceæ ...	
<i>Viburnum opulus</i> , Linn. <i>Washingtonia filifera</i> , Wendl. ... ..	Caprifoliaceæ ...	Europe.
" <i>robusta</i> ... ..	" ...	S. Carolina.
" ... ..	" ...	California.
<i>Widdringtonia Whytei</i> ... ..	Conifereæ ...	Central Africa.
<i>Zamia integrifolia</i> ... ..	Cycadeæ ...	U. S. America.

With but very few exceptions these plants are put out in the Gardens for the first time, and it may therefore be well to note a few of the most interesting ones, omitting altogether any that are ornamental only, or are not known to me to be applied to any useful purpose.

*Acacia cavenia*, Hook & Arnott, "Espino."—This is a small tree yielding a very hard wood, which is applied to many useful purposes. It is also said to be very suitable for a hedge plant.

*Acacia retinodes*, Schlech.—Also a small tree, yielding a good tanning bark, and a valuable gum.

*Acacia pendula*, Cunn, "Weeping Myall."—The wood of this tree is scented, hard, and beautifully marked; it is in demand for cabinet work, and also for tobacco pipes.

*Apios tuberosa*, Moench.—A climber with milky juice bearing a number of small tubers, which are eatable.

*Caryota urens*, Linn., "Wine Palm."—The trunk yields a sago-like starch. From the sap, toddy and sugar are obtained, and the fibre from the leaf stalks is made into ropes, brushes, baskets, &c.

*Chamaerops humilis*, Linn., "Dwarf Fan Palm."—Hats, mats, baskets, and brushes are made from the leaves.

*Chrysophyllum cainito*, Linn., "Star Apple."—Bears an eatable fruit, which is much esteemed in the West Indies.

*Catalpa Kœmpferi*, Sieb. & Zucc.—A quick-growing tree with fragrant flowers; a useful tree for street planting. Some of the Catalpas yield a durable and valuable wood.

*Celtis sinensis*, Persoon, "Henoki."—A fine tree; the wood is useful for carpenters' and turners' work.

*Dacrydium cupressinum*, Soland., "Red Pine," of New Zealand.—Attains a height of 200 feet, and yields a valuable timber, which, however, is not suitable for damp situations. A suitable tree for cemeteries.

*Garcinia indica*, Chois.—Seeds yield a valuable oil, which is used, among other purposes, to adulterate Ghee.

*Liquidambar styraciflua*, Linn., "Sweet Gum Tree."—A large tree, which prefers moist situations; the wood is valuable, and much esteemed for furniture; also yields a gum.

*Piscidia erythrina*, Linn., "Jamaica Dogwood."—A tree reaching 30 feet in height, whose bark is used medicinally.

*Pistachia lentiscus*, Linn., "Mastic Tree."—Yields a resinous gum, and is also used for hedges.

*Podocarpus dacrydioides*, Rich, "White-wood."—A tree belonging to the same genus as our "Yellow-wood." It sometimes reaches 200 feet in height; the timber is soft, and is used for canoes.

*Podocarpus totara*, "Totarra Pine."—A tree belonging to the same genus as the last named; one of the best timber trees of New Zealand, but found only on the North Island. The wood is durable, and not liable to attacks of insects.

*Quillaja saponaria*, "Quillai."—A tree, the bark of which is rich in "saponine," and is used for washing clothes; 2oz. is sufficient to wash a dress, and it is said to remove all spots and stains, and to give a lustre to wool. It has also been used for preparing a hair wash, to promote growth of the hair.

The following plants have been alluded to in previous reports:—

*Melia azadirachta*, "Margosa."—This plant continues to do well, and seems to be quite suited to the coast districts of the Colony. It would appear to be a very valuable tree. A correspondent of the "Tropical Agriculturist" says of it:—

"It yields first a rough bark which Tamils have only lately begun to value as a rival to quinine in fever cases, though administered very sparingly and in small quantities, its taste being intensely nauseous and bitter. Its leaves also are medicinal, and when burnt *green* on a fire in a brazier or earthenware chattie (as well as the dead bark) will, if placed in any room, drive away or kill the most obstinate and bloodthirsty of mosquitoes. The *green* bark is also used successfully as a vermifuge in the treatment of buffaloes and country cattle, and pounded and applied to a sore will kill every worm in it. The timber

sawn from the tree is noted for keeping off white ants. A valuable and particularly clear gum exudes from the bark, naturally in small quantities, but when bruised in large sheets, and yellow drops like icicles. Books bound with this gum are never bored or eaten by worms, and painted on an abrasion or skin wound will take off all pain. The yield of the tree in the shape of fruit is marvellous, and these furnish food to goats, crows, and hundreds of the smaller of the feathered tribe, and the ground under *Margosa* in fruit is daily and nightly carpeted with fruit. The leaf or seed of the *Margosa* contains a valuable, rich and clear oil, sometimes burnt in earthen lamps, but specially valuable for fly-blow sores in horses, elephants, and cattle. It is also used medicinally in *very* minute doses. It smells atrociously, but is very valuable as a lubricant for steel, iron, &c., from which it keeps rust."

This plant belongs to the same genus as our common "Syringa," which is *Melia azederach*.

*Rheum officinale*.—This is the medicinal "Turkey Rhubarb" plant, and in my last report I stated that it was scarcely likely to succeed on the coast, and that I had forwarded seed to the Maritzburg Botanic Gardens for trial there. We have, however, several plants, which appear to be quite healthy, and the Curator of the Gardens at Maritzburg informs me that he also has several plants, which, from his description, would appear to be about the same size as ours. Their further progress we shall therefore watch with interest.

*Rubus trivialis*, "American Dewberry."—This plant has borne fruit during the year, and is worthy of extended cultivation. Of its near relative *R. phanicolasius*, the much-vaunted "Japanese Wineberry," we have a plant or two, which have not yet borne fruit.

*Rumex hymenosepalus*, "Canaigre."—These seeds germinated well, and several plants were reared and formed small tubers, which are now dormant. It is expected that plants reared from them will form tubers of larger size, so that before long we shall be able to say with certainty whether the plant is adapted to the soil and climate of the Colony. Small quantities of the seed were sent to three applicants for trial in other parts of the Colony. Two of them have been unfortunate enough to lose nearly all their plants from unforeseen causes, while from the third I have no report. If this plant should be found to succeed, it will be a valuable addition to the exportable products of the Colony. My first knowledge of it was derived from the "Kew Bulletin" of April, 1890. Since that time a full account of it from the pen of Mr. W. Tyson, of the Cape Agricultural Department, was published in a Cape paper, which I have unfortunately mislaid. It is, however, reported on very favourably as a tanning material.

*Polygonum sacchalinense*.—This plant was reported at some length last year. The plants still continue to do well, and it will, I think, prove suited to the Colony. The U.S. America Experiment Station Record says of it:—

"It seems perfectly acclimatised, and grows vigorously on any kind of soil, and as a green fodder is well liked by stock, especially by cattle. It produces six or more cuttings after the

first year. . . . It is propagated by cuttings of the 'running roots' planted in February. . . . It will remain green and leafy until frost, and withstands drought very well. The annual amount of green fodder produced is very large. . . . The usefulness of the plant as a source of dry winter fodder is still to be investigated."

*Cola acuminata*.—Seeds of this tree were received from Kew, some of which have germinated, but it is as yet too early to report upon their growth.

"Sand Stay Plants."—These plants which were received from Baron F. v. Mueller, as stated in last year's report, have been handed over to the Borough Engineer for planting on the sand dunes near the Point.

*Agave rigida*, var. *Sisalana*, "Sisal Hemp."—These plants are perfectly healthy, and young plants have been reared, and could be obtained in much larger quantities if any demand existed for them, but at present no one seems inclined to undertake the cultivation of fibre plants.

*Epipiemnum mirabile*, "Tonga."—This plant, which has been successfully used in some cases of neuralgia, grows here luxuriantly; plants have been reared, and will be ready for distribution in the early spring.

*Iris Robinsoniana*, "Wedding Flower," Lord Howe's Island.—This plant, which has been for several years in the Gardens, in November last produced a flowering spike, but, unfortunately, the flowers all withered before opening. General Lowther, in a letter to Mr. R. Jameson, says that it bears large snow-white flowers, with golden spots, and that its leaves yield a valuable fibre. It has only flowered twice in England, viz., at Kew and in the Scilly Islands. He also says that perpetual moisture is the best treatment, and, as our plant is in a very dry place, its failure to produce flowers is accounted for. It will now be removed to a more favourable situation.

It will be seen that the plants already noticed are exotics which have been introduced into the Colony for trial; but it is certain that many of our native plants are worthy of more attention than they have hitherto received, and some of these have been alluded to in previous reports as well as in local publications. I have often been applied to with respect to pasture grasses, and have introduced and distributed numerous packets of seed of different species, of which, as a rule, no more is heard. My own opinion is, and always has been, that we require no better pasture grasses than those we already have, but more care must be taken of them, especially in regard to indiscriminate burning, and, in this opinion, I am confirmed by a paper in the "Kew Bulletin" for November last, from which I propose to make copious extracts, as but few people see this publication, and fewer still know the grasses by the names there given. The list of tropical grasses possessing special merit for fodder purposes has been revised by Sir J. D. Hooker, and comprises 20 species, of which 7 are either indigenous or have been imported into the Colony, and the notes on these species I shall quote at some length, merely enumerating such as have not, to my knowledge, been introduced.

## TROPICAL FODDER GRASSES.

The selection of suitable grasses for cultivation in tropical countries is a matter of considerable importance. Few countries have completely solved the question. It is evident also that a good deal of time and energy is spent in the effort to introduce foreign grasses, when there are excellent indigenous grasses close at hand. It is proposed to draw attention to a few grasses that have attained to first rank for fodder purposes in the tropics, and to give particulars respecting the conditions under which they have been found to thrive. It is well known that the same kinds of grasses do not succeed equally well in all localities. There are certain conditions and peculiarities of climate and soil to be considered; but there is no reason to doubt that if careful experiment is made, suitable grasses can be found for cultivation in almost every tropical country. In some of our colonies it is well known that grass, even for valuable horses, is gathered day by day from waste places and jungles. Such fodder is not only poor in quality, but it is liable to be infected with disease from stray animals. Further, during seasons of drought, the fodder supply is likely to fail altogether. The selection and cultivation of grasses, with particular reference to their grazing qualities, or for the production of hay, should receive more attention, and it will doubtless become, before long, a regular branch of rural industry in the tropics, as it has been for so many years in temperate countries.

## NATURAL HERBAGE.

In the tropics the difficulty in establishing grasses is caused by the usually rank growth of weeds and bushes. These soon overrun any cleared area, and they have to be continually eradicated, or the grass would be completely destroyed. The natural herbage in most tropical countries would of itself form excellent pasture for cattle and horses. There is hardly any part of the world entirely devoid of good grasses, and these should first of all receive attention. Where no suitable fodder grasses are available, then, under such exceptional circumstances, it would be well to introduce the useful "Guinea Grass" and "Para Grass" for cultivation on land suitable for the purpose. . . . After the grass has become thoroughly established, an annual clearing after the rains is all that is required. It should, however, be understood that continuous feeding is injurious to the permanency of good pastures. The best grasses are thus destroyed, and rank-growing ones gradually take their place. Close feeding for a time is advantageous, but the pasture should have time to recover before the animals are again placed upon it. Further, it is better to keep cattle on a portion of the pasture at one time, and not allow them to wander at will over a large area.

## TREES IN PASTURES.

Thwaites recommended that in Ceylon trees should always be planted upon land laid out for permanent pasture. The trees would afford grateful shade to the cattle, and they would prevent the grass from being entirely dried up during seasons of drought. Trees would also add to the beauty of the country. Most extensive pastures,

dotted over with shade trees, exist in Jamaica. Many trees, such as the Saman (*Calliandra Saman*) not only give excellent shade, but the pods are a most wholesome food for cattle. The commoner and more hardy sorts of Mango might be planted for the same purpose, as also the Ramoon (*Trophis americana*), the leaves of which afford a very nutritious food for cattle in Tropical America; the Bread Nut (*Brosimum Alicastrum*); the Jack (*Artocarpus integrifolia*); and the bastard Cedar (*Guazuma tomentosa*). The leaves, as well as the fruits, of the last are much liked by cattle. This brief list of useful pasture trees might be considerably enlarged. It would be noticed that many of the trees mentioned belong to the natural order *Urticaceæ*. As the plants belonging to this order are so widely distributed over tropical regions, each country could make its own selection of suitable pasture trees. The best of all is undoubtedly the Saman.\*

#### ANNUAL FODDER GRASSES.

In dry regions not suitable for permanent pastures, the Abyssinian Teff (*Eragrostis abyssinica*) might be grown during the occasional rains and made into hay. This grass will produce a heavy crop of hay in six weeks from the time of sowing. It is very nourishing, and cattle are very fond of it.

The United States Agricultural Department has declared that "the value of Sorghum for feeding stock cannot be surpassed by another crop, as a greater amount of nutritious fodder can be obtained from it in a shorter time within a given space, and more cheaply."

A very valuable fodder grass belonging to this group is the Teosinte (*Euchlœna luxurians*). This yields very large crops in good land, and is regarded as one of the most prolific of annual grasses. Four good cuttings can be made in four months.

The following tropical grasses are selected as possessing special merit for fodder purposes. Amongst them are plants suitable for almost every condition found in tropical countries. The list has had the advantage of the revision of Sir Joseph Hooker, who is now working out the grasses of British India, and who has suggested some emendations of the commonly-accepted nomenclature.

*Anthistiria australis*, † R. Brown.—The well-known "Kangaroo grass" of South Australia, but widely distributed through Southern Asia and the whole of Africa. A perennial upright grass over 3ft. in height. It enjoys a wide reputation, and is regarded as the most useful of the indigenous grasses of Eastern Australia, stock of all descriptions being remarkably fond of it. The roots are strong and penetrate the soil to a great depth, so the plant remains green during the greater part of the summer. In the autumn the foliage turns brown, when, however, its nutritive qualities are said to be at the highest. If cut as soon as the flower stem appears, it can be made into excellent hay.

\* Of the trees enumerated above, two are already in the Colony, viz., the Jack and the Saman, but the latter does not bear fruit with us. Belonging to the order *Urticaceæ*, we have indigenous trees as follows:—*Celtis*, two species; *Trema*, one; *Chaetachme*, two; and *Ficus*, several.

† This is our Red Grass, called by the natives Insinda.

The most reliable way to propagate this grass is by division of the roots. It perfects little seed (Turner).

*Anthistiria avenacea*, F. v. M., "Tall Oat Grass," of New South Wales.—Not in Natal.

*Astrebala pectinata*, F. v. M., North and East Australia.—Not in Natal.

*Astrebala triticoides*, F. v. M. (*Danthonia triticoides*, Ldl.), "Mitchell Grass" of Australia.—Not in Natal.

*Cynodon dactylon*,\* Pers.—A prostrate perennial grass with very narrow glaucous green leaves. It is widely distributed in all hot countries, and extends also into temperate regions. It passes under various names such as "Bahama Grass," "Indian Couch Grass," "Doub," and "Doorva." It is an important grass for covering bare, barren land, and for making smooth compact lawns. It resists extreme drought, and once established in cultivated land it is very difficult to eradicate. It is easily established by planting small portions of the rooting stems about 8 in. apart. If done at the beginning of the rainy season the ground will be completely covered in six weeks. It may also be propagated by seeds, which are now readily obtained in commerce. It should, however, never be planted except in places where it is required to remain permanently. When grown specially for fodder, in enclosed paddocks, it yields three or four crops in the year, and makes excellent hay. In very dry seasons in the West Indies, animals exist almost entirely on the underground rhizomes of this grass.

*Eragrostis abyssinica*, Link, "Teff."—Seed of this grass was received from Kew in 1887, and distributed to many applicants. It was very favourably reported on as a quick-growing fodder grass, but since that time I have heard nothing of it.

*Euchloena luxurians*,† Miers (*Reana luxurians*, Durieu). "Teosinte."—An annual grass of large size, from Guatemala, allied to the maize. . . . It is a tall, densely-tufted grass, sometimes reaching 15 feet in height, the stems are as thick as the thumb at the base, and the leaves 3 to 4 feet long, by 2 or 3 inches broad. Dr. Schomburgk, in 1880, wrote from the Adelaide Botanic Gardens, South Australia: "I have now cultivated Teosinte for three years, and it is one of the most prolific of fodder plants."

Mr. W. R. Robertson, Agricultural Reporter to the Government of Madras, wrote as follows in July, 1883: "A small plot was sown with this crop. The out-turn of green fodder was at the rate of 38,400 lbs. per acre, a very large out-turn, but the cost of production was great, for it was necessary to irrigate the land nearly every other day, from sowing until harvest. . . . On good soils, under liberal treatment, when it can obtain plenty of rain, or irrigation water, the crop grows most rapidly and luxuriantly; but it cannot stand a drought. . . . There is, perhaps, no other crop, sugar cane excepted, which will produce such an enormous quantity

\* This grass is a native of Natal, but is not, I think, much esteemed. It is known to the Zulus as Isinande.

† Seed of this plant was introduced into the Colony many years ago, and it is still occasionally seen in cultivation, but does not appear to find much favour with farmers, probably because sufficient attention has not been given to its requirements in regard to moisture.

of green plant per acre, but the fodder is very watery, and does not appear to be very palatable to stock when offered for the first time. The watery juices of the stem seem to be destitute of saccharine matter during all stages of growth. . . . In the Journal of the Agri.-Hort. Society of India, 1894, p. 78, it is stated: A very good crop was raised this season. After the stalks had reached a height of about 5 feet, they were cut down to within 1 foot of the ground; three weeks later a second crop was ready for cutting, varying in height from 18 inches to 3 feet; a third crop was cut a month later, and yielded stalks about 2 feet high. In this manner, three good cuttings were made in four months. It was found that from  $4\frac{1}{2}$  to 5 lbs. of seed were sufficient to sow an acre. The fodder is greatly relished by cattle. At Lagos, on the West Coast of Africa, Mr. Millen has successfully introduced 'Teosinte' as a forage plant, and in June, 1894, he wrote 'I have planted a quantity of plants of *Euchlœna luxurians*; it is the only fodder plant of those introduced which appears to be growing with good results.

*Leersia hexandra*,\* Sw., "Rice grass."—A widely distributed perennial swamp-grass found in the warm regions of both hemispheres. It has a somewhat slender stem 2 to 3 feet long, with narrow leaves and paniced spikes. In the Philippine Islands this grass is regularly cultivated under the name of *Zacate* for the purpose of supplying food to domestic animals. It is treated like rice, being transplanted to wet and previously-ploughed meadows. Bailey found it to be one of the most relished by cattle amongst the aquatic grasses of East Australia. In Singapore it is regularly gathered in waste places as a green fodder for cattle and horses.

*Panicum colonum*, Linn.—Not in Natal.

*Panicum maximum*,† Jacq (*P. jumentorum*, Pers). "Guinea Grass."— . . . . It is best propagated by root cuttings. It should be planted about 2 feet apart in parallel ridges, at the commencement of the rains. The rows of plants should form lines at right angles to the ridges. This arrangement will facilitate ploughing and weeding between the plants. In Madras this grass is known to resist the effects of severe droughts. In old-established fields it is advisable to pass a plough or cultivator occasionally through and across the crop, and to manure the land thoroughly. Where the plants have formed large tussocks, these should be reduced by simple chopping with a spade or hoe at right angles, thus dividing each one into four parts. Of these, three may be removed for planting elsewhere, or they will form excellent bedding for cattle stalls. During the cold weather of Northern India the plants dry up, and remain dormant until the approach of spring. In places where frosts appear, manure should be applied to the roots at the commencement of the cold season. It is particularly enjoined that Guinea Grass should not be grazed too closely. The "St. Mary's Grass" in Jamaica may be a robust variety of *P. maximum*, or another species. It grows in large tufts to the height of 6 to 8 feet, with the stems hard and indurated in old specimens.

\* Indigenous to Natal.

† Common in coast districts of Natal.

*Panicum bulbosum*,\* H.B.K. (regarded by Munro as a variety of *P. maximum*, and found in the Southern United States), is mentioned by Vasey as likely to be of great agricultural value.

*Panicum molle*,† Swartz. . . . According to Swartz, it is a native of Surinam, and is commonly called "Dutch Grass" in Jamaica.

*Panicum muticum*,‡ Firsk (*P. numidianum*, Lam ; *P. barbinode*, Trin ; *P. molle*, Griseb non Sw.).—It has various names, such as "Para Grass," "Mauritius Grass," "Scotch Grass," and "Water Grass."

*Panicum spectabile*,|| Nees.—A valuable fodder plant, long established in Brazil and other parts of Tropical America. It is known as "Cassim de Angola." According to Spruce, it is also called "Canna Rana." The stem is stout, 5 to 6 feet high, with the nodes softly bearded. The leaves are 3 feet long, and about an inch broad. The spikes are numerous, with the spikelets arranged in 4-6 series. It belongs to the same section of *Panicum* as the "Cockspur grass" (*P. crus-galli*). By some it is regarded as a robust variety of that species. The Brazilian specimens in the New Herbarium are, however, well marked. This grass was introduced, according to Martius (Fl. Bras 11, pp. 2 and 143) from the South West Coast of Africa. It prefers moist situations, and spreads rapidly everywhere. On the Niger, Barter described it as an "aquatic grass 6 feet high." In East Africa, Kirk speaks of it as supplying "the richest fodder for cattle." It is widely spread in Tropical America, in Cuba, Jamaica, various parts of Brazil, and south as far as Paraguay. It is a very desirable grass to introduce into the East Indies.

*Panicum texanum*,§ Buckley.—"Blue Grass," "Colorado Grass," "Buffalo Grass," or "Austin Grass."

*Paspalum conjugatum*,¶ Berg.—"Sour Grass" of Jamaica, "Green Grass" of Singapore.

*Paspalum distichum*,\*\* Linn.—"Silt Grass or "Water Couch."

*Paspalum sanguinale*,†† Lam. (*Panicum sanguinale*, Lam.).—A widely-diffused annual grass, found in all warm regions of the Globe. The stems usually rise to the height of 2 to 3 feet, and at the summit have from 3 to 6 slender flower spikes, each from 4 to 6 inches long. In cultivated areas this grass is a troublesome weed, as it spreads with amazing rapidity. Known in the United States as "Crab Grass," where it is recognised as the most useful of all pasture grasses. It makes a sweet hay, and horses are exceedingly fond of it. Cotton and corn-fields in the south are often so overrun with it that the hay which might be secured would be more valuable than the original crop. In Fiji,

\* Not known in Natal.

† Not known in Natal.

‡ Not known in Natal.

|| *P. spectabile* is not known in Natal, but *P. crus-galli* is not uncommon.

§ Not known in Natal.

¶ Said to be widely distributed throughout Tropical America and Africa, but not known to me.

\*\* Not known to me.

†† This grass is a native of Natal.

Singapore, and Ceylon it is widely-diffused near gardens and plantations. In the former country it is "the best pasture grass," while at Singapore, Ridley says it makes an excellent "turf grass."

*Panicum pabulare*,\* Aitch. and Hemil (*P. ciliare*, D. C.) is a variety of *P. Sanguinale*, described by Aitchison as the best fodder grass for cattle in the Kuram Valley of Afghanistan.

*Paspalum scrobiculatum*,† Linn., "Kodo" or "Koda" Millet, of India.—An erect-growing annual grass, with stems about 2 feet high. It is widely dispersed through the tropics of the Eastern Hemisphere, generally regarded as a valuable pasture grass, and as an ingredient for hay. It sometimes attains a height of 6 to 8 feet. The grain is largely used as food by the natives of India, but it is by no means a wholesome article of diet. Unless special precautions are taken, it is liable to act as a narcotic poison. Cattle, and especially buffaloes, eat the grass readily when it is young. The straw is occasionally used as fodder. Animals are, however, carefully excluded from the fields when the crop is ripening, as they appear to suffer even more than men from the ill effects of *Kodra* poisoning. It is the "Ditch Millet" of New South Wales, and the *Herbe à épée* of Mauritius.

*Stenotaphrum americanum*, Kunth (*S. dimidiatum*,‡ Trin.).— "Pimento Grass" (Jamaica), "Buffalo Grass" (Australia).

These are all the grasses enumerated in the article in the "Kew Bulletin," from which I have copied; and specimens of those that are indigenous may be seen in the Colonial Herbarium. Several other native species are noted by Baron F. v. Mueller as being good pasture and fodder grasses, and I think it would be well for the Colony if greater care were taken for their preservation.

The following articles on the Utilisation of Bananas and Preserving Mangoes appeared in the Bulletin of the Agricultural Department of Jamaica, and may perhaps be found useful by some of our coast fruit-growers:—

#### UTILISATION OF BANANAS FOR MEAL, ALCOHOL, &C.

Stanley's work, "In Darkest Africa," called the attention of the world to the dietetic value of Bananas, especially for invalids. Since that date experiments have been made for the purpose of so preparing Bananas that they might be made use of in all climates, not merely as fruit, but in the form of meal to be cooked as gruel, puddings, &c.

In Jamaica it is of great importance to discover some plan for the utilisation of the fruit, which at present is wasted—the small bunches, and those that are unfit for export for other reasons, such as bruising or over ripeness.

A Committee of the Board of Governors of the Jamaica Institute, with the Director of Public Gardens as Chairman, investigated this subject some time ago, but the conclusion arrived at then was that the data in their possession were not such as to encourage any hopes of planters being able to manufacture the waste Bananas themselves

\* Not a native of Natal.

† This grass was collected in the vicinity of Newcastle by Rev. J. Buchanan.

‡ Not a native of Natal.

or dispose of them to a factory. The Director has, however, been making enquiries in London, and has had an interview with a Dutch engineer, Mr. Hartogh, who has invented machinery for the conversion of Bananas into various products. The specimens seen of these products were of excellent quality, and it is interesting to note that the peel can be used in certain cases for manufacture, as well as the pulp of the fruit. The prospects of this new industry are now more hopeful, and it seems probable that the factories will be started in Jamaica for the utilisation of Bananas that are now wasted.

Mr. Hartogh, after seeing the references to Bananas in Stanley's book, visited Dutch Guiana in 1892 with the object of studying the preparation of Bananas so as to utilise the large proportion of starch contained in them for food, and for other industrial purposes. He invented various machines, and has prepared different products from the Banana, which have been submitted for analysis and test to specialists in all the industries in which starch products are employed.

Whether his special methods are of such a nature as to be profitable both to the planter and to the manufacturer, the results of the tests to which the products have been submitted will be interesting to all growers of Bananas. They have been published in connection with an exhibit in the Antwerp Exhibition of this year, made by the "Stanley Syndicate," which has been founded by Mr. Hartogh, and by Mr. Asser, Civil Engineer at the Hague, who acts as Secretary. An experimental factory has for some time been at work in Dutch Guiana.

Among others, experiments on a large scale have been carried out in Mr. Kahlke's *manufactory of yeast and alcohol* at Königsberg, and at his request in a laboratory at Berlin. An account of these experiments was published in the weekly paper "Alcohol" in its numbers 10, 11, 12, and 15. The use of Banana flour is regarded in this periodical as opening a perfectly new prospect for the industry in question. It is affirmed that the richness of banana flour in starch is in a special state which facilitates in a most remarkable manner the production of yeast without diminishing the quantity of alcohol. The latter has a fine aromatic flavour.

Mr. Kahlke, one of the best-known manufacturers of yeast in Germany, writes in this connection:—

"Banana flour, without doubt, from its richness in starch and its good flavour, is particularly suitable for the manufacture of yeast. This flour is easily rendered saccharine. The yeast obtained by adding Banana flour to the other ingredients has a good colour, all the requisite properties of an excellent class of yeast, and, moreover, keeps well. The alcohol obtained from it leaves nothing to be desired, so that this flour may be introduced as an article of commerce, and employed without any special preparation."

Satisfactory experiments have also been made in some breweries where 20 per cent. of malt has been replaced by the flakes and flour of Bananas. The flavour of the beer was not altered and the quantity of liquid was increased, and the malt was replaced by a less expensive substance.

Experiments are being made in which the proportion of Banana flour is increased. One of the great Belgian brewers writes :—

“ These flakes were macerated in the vat with the malt, and the result was much superior to that of maize, and the flavour of the *must* irreproachable ; the drainage of the mixture was a little difficult at first, but after being stirred a second time the draining proceeded rapidly ; briefly, the use of the flakes may be considered both advantageous and easy in brewing.”

Different Banana flours, and notably that prepared specially for the manufacture of glucose, have been tried in some *glucoseries*. Although difficulties were met with in the manufacture, principally with respect to discolouration, it has been shown that the glucose obtained from it has a good flavour, is very sweet, and slightly aromatic.

It is highly probable that a special study of the subject will surmount the slight difficulties which at first presented themselves in the use of this new product in *glucoseries*.

Very nourishing bread has been made from equal proportions of Bananas and Wheat and Rye flour, and even from a mixture of two-thirds Bananas and one-third ordinary flour.

A sweet Banana flour having an agreeable flavour of fresh fruit appears to be specially suitable for cakes and biscuits.

#### PRESERVING MANGOES.

As the cultivation of the Mango is rapidly increasing in the Colony the following may be found useful by some of the growers. It is taken from the Jamaica Bulletin of the Botanical Department, and has been written by Mr. E. M. Shelton, of the Department of Agriculture, Queensland :—

*Canning*.—After peeling, the fruit is separated from the stones by slicing into pieces of convenient size. These should be stewed for a few minutes only, before pouring into the cans, in syrups strong or weak in sugar to suit taste, or the fruit may be cooked in the can with the syrup as before. There may be a difference of opinion as to the palatableness of canned Mangoes. A considerable number of those persons who have tasted the results of our work have pronounced the canned fruit excellent, while others have declared their indifference to it. A like diversity of opinion, we note, holds respecting the raw fruit, particularly with those who are unaccustomed to its peculiar flavour. Mangoes stewed in the form of a sauce will be found a welcome addition to any dinner table. “ As good as stewed peaches,” we have heard them pronounced.

*Marmalade*.—Webster defines marmalade as “ preserve or confection made of any of the firmer fruits boiled with sugar, and usually evaporated so as to take the form of a mould.” Nearly in this sense the word “ marmalade ” is used in this essay. Peel and slice the Mango, cutting close to the stone, using plenty of water. Boil until the fruit is thoroughly disintegrated, when the pulp should be run through the colander with the purpose of extracting the “ wool.” Sugar should now be added to suit the taste (about  $\frac{3}{4}$  lb. to the pint of pulp), and the mass boiled until clear, when it should be poured into the moulds or jars in which it is to be kept. This

marmalade is of a rich golden yellow colour, it retains the form of the mould perfectly, and it seems in all respects to satisfy the most exacting taste. In the absence of the experience necessary to test the keeping qualities of Mango marmalade, it would be the part of wisdom to seal the jars designed for future use while hot with wax, or, better yet, with a plug of cotton wool.

*Jelly.*—For jelly, prepare the Mangoes by slicing as for marmalade ; boil the fruit with water, prolonging the boiling only to the extent of extracting the juices. Great care should be taken in boiling, as the Mango rapidly “boils to pieces,” in which case it is impossible to make satisfactory jelly. Pour off the juice, strain and boil down to a jelly—an operation that occupies only a few moments, as the Mango is rich in gelatinous materials. The pulp remaining after the jelly has been removed may be used to advantage in making marmalade. In the amount of sugar used in making jelly the house-keeper is safe in following old practices in this respect with other fruits. It is impossible to give exact rules in all the operations connected with working up this fruit. In general, it will be well to use in boiling, water somewhat to excess, and as the Mango “cooks” readily, constant watchfulness is needed to prevent burning.

To show something of what is possible in the way of results with this fruit, I may say that in our experiments 13 good-sized Mangoes gave one pint of jelly and five quarts of marmalade. This certainly must be counted a very favourable, not to say remarkable, result.”

In conclusion, I have much pleasure in offering my very hearty thanks to all who, by donations of seeds, plants, &c., or in other ways, have assisted me in my work. Also the Steamship Companies, merchants, Captains of vessels, and especially to Messrs. King & Sons, whose steamers have repeatedly carried cases of plants to and from India free of all charge ; and to the members of the Committee for valuable advice and assistance in many matters connected with my work.

I have the honour to be,

Gentlemen,

Your obedient servant,

J. MEDLEY WOOD.

# THE DURBAN BOTANIC SOCIETY.

## Cr. RECEIPTS AND EXPENDITURE, 1894. Dr.

		£	s.	d.		£	s.	d.
1894. BY RECEIPTS—					1894. To EXPENDITURE—			
Credit Balance, 31st December, 1893	217	16	7		Labour	...	...	1012 6 3
Produce Sold ...	...	835	5	4	Maintenance	...	...	240 5 1
Government Grant ...	...	350	0	0	Rations	...	...	83 10 0
Herbarium	...	40	0	0	Interest	...	...	42 0 0
Subscriptions...	...	243	1	6	Colonial Herbarium	...	...	34 8 11
Special Grant for Cabinets ...	...	30	0	0	Commission	...	...	9 13 9
					Coolie and Kafir House	...	...	82 4 4
					Printing	...	...	33 16 6
								<u>£1538 4 10</u>
								177 18 7
					Balance in Natal Bank			<u>£1716 3 5</u>

The Society owes £700 on a Debenture Bond bearing interest at 6 per cent. per annum.

Audited and found correct.

GEO. RUSSELL,  
Auditor.

MAURICE S. EVANS,  
Hon. Treasurer.

February, 1894.

Dec. 31, 1894.

# ABSTRACT OF METEOROLOGICAL OBSERVATIONS FOR THE YEAR 1894,

TAKEN AT THE NATAL OBSERVATORY, DURBAN. READINGS 9 A.M. AND 3 P.M.

Readings of Barometer reduced to sea level and 32° Fahrenheit. A light wind has a mean force of 1.00. A fresh wind a mean force of 2.00. 10 corresponds to an overcast sky. Zero to a clear sky.

	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Mean
Barometer—Highest ... ..	In. 30.253	In. 30.271	In. 30.274	In. 30.454	In. 30.456	In. 30.625	In. 30.801	In. 30.589	In. 30.527	In. 30.477	In. 30.519	In. 30.360	In. 30.467
Lowest ... ..	29.692	29.820	29.693	29.861	29.797	29.873	29.851	29.765	29.772	29.640	29.744	29.746	29.783
Mean, 9 a.m. ... ..	30.042	30.089	30.041	30.197	30.223	30.222	30.245	30.258	30.218	30.080	30.065	30.074	30.15
Thermometer in shade—	Deg. 89.3	Deg. 91.6	Deg. 91.6	Deg. 86.2	Deg. 86.2	Deg. 85.8	Deg. 83.5	Deg. 83.3	Deg. 80.4	Deg. 84.9	Deg. 89.1	Deg. 86.9	Deg. 86.5
Highest ... ..	62.5	63.0	61.4	56.5	49.7	48.8	42.3	47.7	53.3	54.9	55.5	58.0	54.5
Lowest ... ..	77.7	76.4	76.7	68.8	64.3	62.3	60.9	64.3	66.5	69.8	74.4	74.3	69.7
Mean, 9 a.m. ... ..													
Mean reading of													
Maximum Thermometer	84.5	83.5	83.3	78.7	76.2	76.3	74.9	76.7	73.5	76.0	81.1	81.1	79.0
Minimum	68.2	68.0	68.3	60.3	57.4	54.4	52.3	56.7	58.2	61.8	64.5	64.2	61.2
Rainfall ... ..	In. 1.72	In. 3.64	In. 2.19	In. 4.20	In. 2.91	In. .58	In. .32	In. .38	In. 10.06	In. 3.68	In. 2.85	In. 4.71	In. 37.27
Units	11	14	9	11	11	4	3	7	21	22	20	19	152
Days on which rain fell	11	14	9	11	11	4	3	7	21	22	20	19	152
Mean force of wind ... ..	1.55	1.45	1.32	1.32	1.22	1.25	1.31	1.50	1.67	1.19	1.12	1.24	1.35
Mean amount of cloud ... ..	5.5	5.6	4.1	3.8	3.5	2.8	3.0	3.1	6.9	7.0	6.3	5.8	4.8

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