

R E P O R T

—ON—

NATAL BOTANIC GARDENS

—AND—

Colonial Herbarium

—FOR THE—

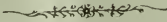
YEAR 1906-1907

—BY—

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

Corresponding Member of the Pharmaceutical Society
of Great Britain.

DIRECTOR.



DURBAN:

BENNETT & DAVIS, PRINTERS, GARDINER AND SMITH STREETS.

1907.



Durban Botanic Society.



REPORT

—ON—

NATAL BOTANIC GARDENS,

—FROM—

July 1st, 1906, to June 30th, 1907,

—BY—

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

Corresponding Member of the Pharmaceutical Society
of Great Britain.

DIRECTOR.

25868

1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2060
2061
2062
2063
2064
2065
2066
2067
2068
2069
2070
2071
2072
2073
2074
2075
2076
2077
2078
2079
2080
2081
2082
2083
2084
2085
2086
2087
2088
2089
2090
2091
2092
2093
2094
2095
2096
2097
2098
2099
2100

DURBAN BOTANIC SOCIETY.



President :

SIR B. W. GREENACRE, K.B.

Committee :

MR. T. W. EDMONDS

MR. M. S. EVANS

HON. R. JAMESON, M.L.C.

MR. H. H. PUNTAN

MR. J. DICK

MR. W. BUTCHER

Government Members :

MR. W. PALMER

MR. J. D. BALLANCE

Mayors of Durban and Pietermaritzburg, *ex officio*.

Sec. and Accountant :

MR. G. BURGESS

Treasurer :


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

Director :

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

Curator :

MR. J. WYLIE.



Digitized by the Internet Archive
in 2012 with funding from
Field Museum of Natural History Library

NATAL BOTANIC SOCIETY.

BYE-LAWS.

The Gardens are open to the public every week-day from sunrise to sunset; on Sundays from 2 o'clock p.m. until sunset.

Children under 10 years of age, unless accompanied by competent protector, cannot be admitted.

Persons accompanied by a dog or dogs cannot be admitted.

No vehicle shall be allowed entrance, and all bicycles must be left at the gate, but upon application to the Director or Curator, invalids in wheeled chairs may be permitted.

Admission may be granted to picnic parties if permission be first obtained from the Curator.

Visitors are requested to keep to the paths, and any person sliding, running or walking up and down the grassed embankments will be liable to be expelled from the Gardens.

Touching or handling plants, fruits, or flowers is strictly prohibited, the indiscriminate use of butterfly nets is prohibited, but permission to use such nets may be obtained from the Director or Curator, and will be available for the day of issue only. This permission will not be granted on Sundays, and may at once be withdrawn if the privilege is abused.

All games, climbing of trees, shooting of guns or catapults, throwing of stones or fruit, disorderly or indecent behaviour, are strictly prohibited.

Any person abstracting, destroying, or damaging any property of the Society shall be liable to be prosecuted.

The Director is hereby authorised to prosecute offenders under the fore-going Bye-laws whenever found to be necessary.

The Jubilee Conservatory is open to the public as under:—

Week-days from 9 a.m. to 6 p.m., in summer; from 9 a.m. to sunset in winter; Sundays from 2.30 p.m. to 5.30 p.m. in summer; from 2.30 p.m. to sunset in winter.

The public are admitted to the Nurseries and Forcing Houses on business only, during business hours, and on Sundays and Public Holidays they are closed altogether to visitors.

REPORT.

*To the President and Committee,
Durban Botanic Society.*

GENTLEMEN,

I have again the pleasure of submitting this which is my Twenty-seventh Annual Report, on the work at the Botanic Gardens and in the Herbarium during the year. The weather has been very favourable to the growth of the plants, and there are no losses of any consequence to report. The Mango and Litche crops were this season a complete failure, due to attacks of the "Fruit Fly." Scarcely a single ripe and perfect fruit was gathered. The Nursery has been again examined by the Assistant Government Entomologist, and the permit has been renewed. The fumigation house is in constant use, and every care is taken to keep the young stock clear of insect pests.

In consequence of the work done by the Corporation on the flat, and by ourselves in filling up the pond at the bottom of the Gardens, the malaria is now almost, if not, quite a thing of the past.

The Tea Room has been thoroughly well conducted by Mrs. and Miss Malyon, and is fairly well patronised, especially by visitors to the Colony, who are, as a rule, enthusiastic in their praise of the Gardens, and also of the Tea Room, as the Visitors' Book kept by Mrs. Malyon abundantly shows.

I regret that in consequence of the pressure of other work the Corporation has been unable to erect the fence along the Sydenham Road boundary, as verbally agreed on, but it is hoped that this work will soon be taken in hand, more especially so as in consequence of soil having been taken away by the Corporation employees for repair of the Sydenham Road, the living fence of *Aberia caffra* has been in places damaged to a great extent, and unsightly gaps are left in it, which are frequently made use of by a certain class of people, who occasionally visit the Gardens. The behaviour of visitors to the Gardens is fairly good, but carving initials on the seats and running or walking up and down the grassed embankments still continues. The latter chiefly by children, but occasionally by those who ought to know better. Some additions have been made to the bye-laws and authorised by Government, they are

as follows:—"Visitors are requested to keep to the paths, and any person sliding, running or walking up or down the grassed embankments will be liable to be expelled from the Gardens."

"The indiscriminate use of butterfly nets is prohibited, but permission to use such nets may be obtained from the Director or Curator, and will be available for the day of issue only. This permission will not be granted on Sundays, and may at once be withdrawn if the privilege is abused."

It must also be remembered that the Nurseries and Forcing Houses are open to the public on business only, and on Sundays and Public Holidays they are closed altogether to visitors. The upper Nursery has now been enclosed, the portion adjoining the Gardens near the Conservatory with Karri wood palings and double gate, the remainder with barbed wire.

The cultivation of the fibre-yielding plants *Fourcroya gigantea*, the "Mauritius Hemp" and *Agave rigida*, var. *sisalana*, the "Sisal Hemp" is now receiving much attention and numerous inquiries have been received on the subject. Large areas of the first named species have already been planted, but bulbils or plants of the "Sisal" are not obtainable in quantity.

In the year 1889, we received by parcel post from the Royal Gardens, Kew, twenty plants of the "Sisal." These were at once planted out, and we scarcely lost a single plant; shortly afterwards we received a larger consignment, but on arrival these were all found to be dead. These plants or their progeny have been in the Gardens ever since, and have produced thousands of bulbils for which there was no demand in the colony, and which have therefore been wasted. During the last few months the demand for them has greatly increased, and many hundreds of bulbils and root cuttings have been supplied to applicants, but we are not in a position to supply them in very large quantities, but many more will be sent out in the Spring months. During the month of March, Mr. Wylie left on the usual annual collecting trip, obtaining a large number of plants for exchange with other Botanical Institutes, and also a good collection of dried specimens for our own Herbarium, amongst them being a number of rare species, and one at least which is new to the colony. He also brought two large trunks of an *Encephalartos* of a rather rare variety; these plants were found by myself in Zululand many years ago, the largest trunk being about 18 feet in height. Some years ago Mr. Wylie brought three trunks of this variety about 3 to 4 feet in height, which we planted here; after remaining for more than two years without putting out any leaves, all of them commenced to grow, and a photo of one of them is here



ENCEPHALARTOS ALTENSTEINI, LEHM.
VAR. BISPINOSA.

given. It was our intention to have, if possible, the largest trunk brought down, but during the late rebellion the natives had so damaged it, presumably using it as medicine, that it was quite unfit for our purpose, which I much regret, as it was the largest trunk of any of the genus that had been seen in Natal, larger even than the "Giant *Encephalartos*," a photo which is I understand in the Museum at Kew Gardens. The two trunks brought down by the Curator are now planted in front of and below the Palm House, one of them is 7 feet and the other 6 feet above the ground, and each of them at least 2 feet 6 inches in the ground.

The plant here figured is believed to be a variety of *Encephalartos Altensteinii*, Lehm, and the photo was taken in the Gardens by Mr. W. D. Haygarth.

In a previous report I stated that our tree of *Cinnamomum cassia* had been maliciously damaged by barking the stem from about 4 feet above the ground, to even below the surface of the soil, and I hardly expected that it would survive; it has, however, now produced a sucker from the root, and will most likely recover, but so long as Indians are living on the ground, and are able to get into the Gardens at night or early morning I fear that the same thing is likely to occur again when the tree is sufficiently grown.

The trees of *Manihot Glaziovii* have been removed, leaving only two or three specimen trees in the Gardens, these trees having been raised from cuttings and become very unsightly and the ground upon which they stood could be put to better use. There has been no demand for the seeds in Natal, and for years past it has been sold for planting on the East Coast; their own trees are now bearing seeds, and the demand has altogether ceased. We shall still be able to supply a limited quantity of seeds in the season if any person elect to give the tree another trial.

The "Guide to Trees and Shrubs in the Gardens," which was published in 1897 is now getting out of date, some of the plants catalogued in it are dead, and many others have been planted, a new edition is therefore urgently required, and has been commenced, but has been put aside for the present as we have a number of tree plants to place out in the spring and summer, and some old and useless ones to clear away as soon as time can be spared for the purpose. If the new Guide were to be published now it would in a very short time be incomplete, as a number of interesting plants would not be included in it.

There are still many trees and shrubs in the Gardens which are without labels, or with only the wooden ones bearing a number corresponding with the one given in the Guide, and it is I think advisable that more of the metal labels should be obtained; after several years trial they have been found the best for the purpose; the enamelled ones with black letters on a white background are more conspicuous, and look better, but will not stand the changes of temperature, the enamel chipping off until at last the lettering is illegible; all of them will eventually have to be replaced. We imported some iron ones, with the lettering in white metal, and with a smaller label hanging from each bearing the number given to the tree in the Guide, and these though less conspicuous than the enamelled ones, we find to be the best for general use. It would be advisable to obtain some of a larger size, giving the popular name of the tree as well as the Botanical name, the native country, and the date of planting. These would be rather more expensive but the number required would not be large.

The European staff at the Gardens is unchanged, but another gardener is much required, and it is hoped that when circumstances permit a suitable man may be engaged. Several of the indentured Indians have left, their time having expired, and the supply of Native labour is very uncertain, more men are required than we have or can obtain at present. The Curator, Mr. Wylie, is, during much of the year hard pressed with work, but during the last few months we have been quieter than is usual.

The malaria from which we suffered so severely is now almost, if not, quite a thing of the past, though the "Anopheles" mosquito is occasionally seen, and doses of quinine as a preventative are still necessary.

To the members of the Committee my very hearty thanks are again offered for much valuable advice and assistance in the matters which have from time to time been brought before them.

I have the honour to be,
Gentlemen,
Your obedient servant,

J. MEDLEY WOOD,

Director.

Packets of seeds have been received during the year as under :—

Royal Botanic Gardens, Kew	...	...	1
" " " Mauritius...	...	...	40
" " " Calcutta	...	...	8
Botanic Gardens, Trinidad	...	...	4
" " British Guiana	...	...	7
" " Bangalore	...	...	1
Bureau of Forestry, Manila	...	...	13
Department of Agriculture, Washington	...	...	2
Conservator of Forests, Transvaal	...	...	1
Department of Agriculture, Transvaal	...	...	2
G. Plange, Transvaal	...	...	2
G. Thorncroft, Transvaal	...	...	1
Dr. Franceschi, California	...	...	20
J. C. Harvey, Mexico	...	...	2
C. Sprenger & Co., Naples	...	...	14
M. Herb, Naples	...	...	31
James O'Brien, London...	...	...	1
Captain French, Transvaal	...	...	1
Mr. Bishop, Umgeni	...	...	27
Hon. R. Jameson, Bellair	...	...	1
J. Kirsop Young, Durban	...	...	1
Mr. Giletti, Krantz kop...	...	...	1
G. Keys, Durban	...	...	6
Mrs. English, Transvaal	...	...	1
Mr. Orppen, Durban	...	...	1
E. M. Holmes, London	...	...	1
W. H. & H. Le May, London	...	...	2
T. W. Turner, Durban	...	...	4
Imperial Gardens, Russia	...	...	7

203

Packets of seeds have been sent to the following persons and institutions :—

Royal Botanic Gardens, Kew	...	...	36
" " " Calcutta	...	...	36
Botanic Gardens, Adelaide	...	...	36
" " British Guiana	...	...	36
" " Brisbane	...	...	36
" " Bangalore	...	...	36
" " Dunedin	...	...	35
" " Hong Kong	...	...	35
" " Mauritius	...	...	36
" " Melbourne	...	...	36

Botanic Gardens, Montreal	...	...	35
" " Ootacamund	...	...	36
" " Ottawa	...	...	36
" " Port Darwin	...	...	36
" " Saigon, Cochin China	...	...	36
" " Singapore	...	...	36
" " Sierra Leone	...	...	35
" " Sydney	...	...	36
" " Trinidad	...	...	36
Agri-Horticultural Society of India, Calcutta	...	...	36
" " " " Madras	...	...	36
Bureau of Forestry, Manila	...	...	36
J. C. Harvey, Mexico	...	...	37
Dr. Franceschi, California	...	...	36
Reasoner Bros, Florida, U.S.A.	...	...	36
Evans & Son, Wellington, New Zealand	...	...	2
W. G. Scott, Coronada, U.S.A.	...	...	14
Mr. Modin, Sweden	...	...	18
Conservator of Forests, Transvaal	...	...	1
S. H. Power, Mid Illovo	...	...	3
G. Keys, Durban	...	...	15

 915

Plants, bulbs, and cuttings sent away:—

Royal Botanic Gardens, Kew	30 bulbs, Sandersonia	aurantiaca.
" " " Mauritius	154 plants, Citrus, Roses,	and Palms.
Dept. of Agriculture, California	12 bulbs, Richardia	Rehmanni var.
Rev. W. Wilks, London	6 bulbs, Richardia	Rehmanni var.
James O'Brien, London	200 bulbs, Sandersonia	aurantiaca.
Barr & Sons, London	150 bulbs, Sandersonia	aurantiaca.
James Grieve, Edinburgh	100 bulbs, Sandersonia	aurantiaca
" " "	15 bulbs, Cyrtanthus	sanguineus.
Reasoner Bros, Florida	30 bulbs, Sandersonia	aurantiaca.
Conservator of Forest, Transvaal	8 plants, Khaya sena-	galensis.
" " " Natal	2,552 forest trees.	

Plants and bulbs received :—

Royal Botanic Gardens, Mauritius	...	41 plants,	9 species.
Botanic Gardens, Maritzburg	...	58	58
Conservator of Forests, Natal	...	1255	45
Superintendent of Parks, Johannesburg	...	39	39 varieties.
W. J. Haygarth, Durban	...	50	4 species.
John Parry, Durban	...	4	1
Mrs. Linfoot, Estcourt	...	1	1
Hon. R. Jameson, Bellair	...	270	1
Mrs. Staunton	...	3	1
F. Stayner, Cedara	...	60	2
E. L'Estrange, Natal	...	1	1
W. R. Gordon, Natal	...	3	1

1,785

372 Packets of seeds and 359 plants and bulbs were received during the year 1905-6, with the following results —

PLANTS.		SEEDS.	
Dead on arrival	... 36	Failed to germinate	... 80
Died afterwards	... 15	Germinated, but died afterwards	... 32
Still in pots	... 250	Planted in pots	... 160
Planted in Gardens	... 40	Annals and vegetables	... 40
Previously in stock	... 18	Not suitable to climate	... 24
		Duplicates	... 36
	<hr/> 395 <hr/>		<hr/> 372 <hr/>

The following plants were put out in the Gardens during the years 1906-7 :—

PALMS AND CYCADS.

<i>Acanthophoenix crinita.</i>	<i>Macrozamia secunda.</i>
<i>Areca triandra.</i>	„ <i>Fawcettii.</i>
<i>Arenga Engleri.</i>	„ <i>Fraseri-eburnea.</i>
„ <i>saccharifera.</i>	„ <i>spiralis.</i>
<i>Calamus intermedius.</i>	<i>Martinezia caryotaefolia.</i>
<i>Caryota Rumphiana.</i>	<i>Oreodoxa Boringeana.</i>
„ „ <i>var Alberti.</i>	<i>Phoenix canariensis.</i>
<i>Cocos Alphonso.</i>	„ <i>farinifera.</i>
„ <i>Weddeliana.</i>	„ <i>paludosa.</i>
<i>Corypha elata.</i>	„ <i>rupicola.</i>
<i>Elaeis guineensis.</i>	„ <i>tenuis.</i>
<i>Encephalartos Altensteini</i>	<i>Pritchardia pacifica.</i>
Lehm, <i>var. bispinosa.</i>	
<i>Hedyscepe Canterburyana.</i>	

Howea Belmoreana.	Pseudophoenix Sargentii.
„ Fosteriana.	Ptychosperma Macarthurii.
Livistona rotundifolia.	Raphia pedunculata.
„ Woodfordii.	Rhapis aspera.
Macrozamia flexuosa.	„ humilis.
„ Pauli-GuIELMI.	Rhopalostylis sapida.
„ heteromera.	Thrinax radiata.
„ corallipes.	

Acokanthera venenata.	Beaucarnea tuberculata.
Brownea grandiceps.	Carissa sp, Nkandhla.
Carludovica crinifera.	Cordyline lineata.
Cordyline australis.	Dasyliirion gracile.
Dasyliirion glaucophyllum.	„ serratifolia.
Ficus elastica variegata.	Ficus pandurata.
Imbricaria coriacea.	Hevea brasiliensis.
Musa Gilletti.	Ipomoea digitata.
Jasminium angulatum.	Musa religiosa.
Pandanus microcarpus.	Phyllanthus intermedius.
Thunbergia alba.	Strelitzia Livingstoniana.
	Xanthorrea hastilis.

PHORMIUM TENAX, FORST. "NEW ZEALAND FLAX."

As frequent enquiries are made as to the suitability of this plant for profitable cultivation in Natal, it may not be out of place to give some information about the plant and what is being done with it elsewhere, premising that there appears to be no difficulty in growing the plant in the Colony since we have in our Museum leaves grown in Natal 6 to 7 feet long, and have seen others at different times nearly or quite as long. The plant belongs to the order Liliaceæ, and is a native of New Zealand and Norfolk Islands only. An article by Joseph Knight in the *Journal of Agriculture of Victoria* of June, 1906, gives the following particulars as to this plant, its cultivation, propagation, varieties and extraction of the fibre.

CLASS OF SOIL SUITABLE.

It would be difficult to say what soil this hardy plant will not thrive in, but there are certain conditions which it must have to be successful. There is one in particular, that is sufficient moisture. It does not mean as is generally supposed, that it wants a swamp, or a running stream, but a humid climate, so as to assure a constant and steady growth. In the dry arid districts it will be found thriving well along the water channels and where the soil is free it makes wonderful growth.

Much depends on the variety planted. The late Baron von Mueller describes both hill and swamp varieties. Sir John Hector mentions in the publication previously referred to, 50 varieties which are recognised by the natives, but it is questionable whether many of these are not the same, or at least "sports" or hybrids, as must be the case when plants are grown together, and spring up from seed dropped. There is also in the work referred to an account of twenty-five acres being planted by the "Patea Flax Company," in which the number of varieties selected consisted of six, described as follows:—

Oue ...	...	Red edge.
Atiraukawa	...	Light bronze edge.
Korako	...	Black edged, light colour in leaf.
Huhiroa	...	Black narrow edge.
Atewheke	...	Scarlet edge.
Tihore ...	...	Orange edge and keel.

Unfortunately, whilst giving the names of varieties, they do not describe the class of land planted. To plant the hill varieties in low-lying land, or swamp varieties on the hills would be a mistake.

Varieties should be selected to suit the soil and other conditions. My experience leads me to say that on the light-red chocolate soil in our highlands, where the rainfall is good, any of the hill varieties will make a growth equal to any described.

The same applies to light sandy or loamy soil where there is sufficient moisture with drainage. The so-called swamp varieties will do well in a situation such as the banks of a running stream, or where the land is occasionally flooded, but will not thrive in low, stagnant pools. The best growth is made in reclaimed swamps, or where the swamp has been partly drained to a depth of 1 foot or so.

It can not be too strongly impressed on the minds of those about to plant that the soil and the variety must be considered. There should be no difficulty in getting the soil to suit the class of plants available. There are large tracts of country along the Coast portion of it covered with cut grass, and useless for the purpose. Much of this land, with proper treatment, will produce flax in abundance. This was recommended by the late Baron von Mueller over 40 years ago, when distributing plants, &c., from the Botanical Gardens.

Phormium tenax is one of the most hardy plants introduced, and there is no difficulty in finding suitable soil in most parts of the state.

PROPAGATION.

There are two methods by which plants may be provided, namely, "seedlings," and "division of roots." The division of roots or stools, is that generally recognised as being the best. * * * * *

It is well understood that when a number of plants of the same variety are grown together that the flowers become hybridized, and that the seedling cannot be regarded as characteristic of the parent. No doubt, it is a much less expensive way to secure plants, but where, as in this case, a plantation is made for almost all time, it will repay the selection of plants when planting.

To those who have isolated plants growing and these of sufficient merit to warrant their use, the seeds may be used with safety; but where there is any chance of the plants becoming as described above, it would be unwise to adopt this course. I regret to say that in New Zealand, where this industry flourishes to such a large extent, very little attention is given to the selection of plants; although it takes a certain number of tons to produce a ton of fibre, it is recognised that by selection and cultivation the same weight of leaves will yield twice the amount of fibre. I cannot help thinking that in the establishment of an industry of this kind it is imperative that a thorough investigation should be made into the character and condition of the plants about to be set out.

METHOD OF PLANTING.

There is nothing to guide us in this respect so far as plantations are concerned. The crops of *Phormium tenax* are generally self-sown, and in their natural state grow without cultivation, but the principal is similar to various other plantations which have to be worked by manual labour. The character of the soil will have much to do with distance and other arrangement. The plants when fully grown, spread out, covering from 4 to 6 feet in width, and whilst they would be kept in check, to a certain extent by annual cutting, the planting would necessitate allowing sufficient room for the plant to develop thoroughly.

The plantation of the Patea Flax Company, referred to previously, was set out in rows 6 feet apart, and plants standing 6 feet between each other in the rows; but it is quite clear that where the land is suitable, and other conditions favourable, that the ground would be completely covered, and the plants become stunted from want of nourishment. If an additional 2 or 3 feet were left between the rows, it would allow for the working generally of the plantation.

It must be borne in mind that there is a great bulk of material to be taken from a plantation. The yield is said to be from 12 to 18 tons per acre, and to get this away it would be necessary to have roadways, as in vineyards, say every ten rows, to gather up the bundles of leaves.

TIME OF PLANTING.

The most suitable season for planting is autumn, but when that is not convenient early spring may be adopted. With autumn planting, the sets become established by the heat retained in the soil, and will pass the winter over without suffering. Such plants may be also said to save a season's growth, as they are able to take advantage of the full spring season. But spring growth will answer equally well so far as the establishment of the plant is concerned.

The plant is an extremely hardy one, and will adapt itself to conditions where other plants would perish. In the establishment of an undertaking like this, it is advisable where practicable, to have the soil thoroughly in order, and to plant out in early autumn.

GATHERING THE LEAF.

The plant consists of a number of shoots clustered together, each shoot producing a quantity of leaves, which strike up from the centre. The outside leaves when not gathered, wither and die, and are of little value for fibre; but, when gathered annually, they are cut off near the bottom, leaving two or three centre ones uncut. It is stated that those who adopt this system gather an annual crop from the same plants, and the plant itself makes a more rapid growth. This is reasonable and it is well known that any plant deprived of its foliage is checked in its growth for some time. But this system is not universally adopted; in some cases the whole plant is cut off at one time, centre leaves and all. These are sorted, or graded, at the mill before treatment.

Where there is a plantation which has been carefully planned out, it is well worth taking every care in preserving it; and by cutting the outside leaves of each shoot, and leaving the three centre ones, less check will be given to the growth, and an annual gathering will be secured. The leaves should be cut off just below where the green portion terminates, as the soft, thick parts do not work up well with the other portion of the leaf and have to be recut at the mill before treatment. These, when cut, are bound up into sheaves of a size convenient to handle, and are carted to the mill, where they are sorted out ready for treatment.

THE YIELD.

The officials of the Department of Agriculture, New Zealand, state that, from uncultivated land, from 12 to 18 tons of green leaves per acre are gathered, but from a properly planted and cultivated plantation, according to experiments made, upwards of 50 tons could be gathered, and that the yield of fibre from carefully selected plants would be greater. According to the experience of various mills in New Zealand, it takes from $5\frac{1}{2}$ to 6 tons of green leaves to make one of fibre.

There are various methods adopted in New Zealand of gathering leaves. It is usually from private land that they are obtained, and the owners claim a royalty; in some cases 12s. per ton is paid for the leaves as they are carted to the mill. The cost of putting and binding is from 10s. to 12s. per ton. In some parts where the mills are worked in the close vicinity of navigable streams, the green leaf is delivered at a cost of 20s. to 25s. per ton.

If the yield of the leaf is 12 tons per acre this will				
give 2 tons of dressed fibre at £20 per ton	...	£40	0	0
Cost of leaves delivered at mill—12 tons at 22s. 6d.				
per ton	...	...	...	13 10 0
				<hr/>
				£26 10 0
				<hr/>

EXTRACTING FIBRE.

There are two methods of treating this product to extract the fibre—one by machinery, and the other by chemicals and machinery. The latter method has not been used to any extent, but is spoken well of by various writers. That the fibre can be extracted has been proved to me on various occasions. A firm in the city which has taken up the treatment of the *Linum flax* has produced good samples of fibre from *Phormium tenax*. But the principal method of extracting the fibre is by machinery, and quite a number of various designs are in use in New Zealand. Most of these do good work. Recently the New Zealand Government gave a bonus for the encouragement of an improved machine, and considerable competition took place.

The commission appointed to examine into the merits of the various competitors have set forth the particulars of each in their report to the Hon. Minister of Agriculture, which is published in pamphlet form and distributed. This is interesting reading to those who contemplate dealing in any way with *Phormium*. As to the cost of machinery, much depends on the

amount to be treated. Some mills are put up to produce several tons of fibre in the week, whilst others aim at smaller productions.

The power employed is an important item in giving the cost of a "treating plant." One capable of producing, say, one ton or so of fibre per week may be set down at from £150 to £200; this is complete, without the power. There are according to an official publication, about 400 mills at work in New Zealand. Some are worked by water power, others by steam, but little can be said of the machinery, from the information at present available.

From the experience gained in dealing with the production of the *Linum flax*, one of the most important features is to show that there is machinery available for its treatment when produced.

VARIETIES.

The following descriptions are taken from Sir James Hector's work.—

Harakeke (Common Swamp Flax).—Leaves coarse, loose drooping points generally blunt; flower stalk large, 11 feet to 14 feet high, and 1 inch to 2 inches in diameter; pod short, erect. Grows almost anywhere, but attains its largest size (14 feet to 15 feet) on rich alluvial soil, by banks and streams. Many sub-varieties are found, some with dark blue-green leaves above and glaucous below, and some pale olive-green, or bronzy. Some varieties have also the butts of the leaves coloured with red for some distance up, while others are yellowish-green almost to the very base. When the plant is stunted, the flower-stalk is also small, and the best characteristic is the blunt point to the leaf.

Paretaniwha. (Yellow Hill Flax).—Leaves erect, slightly drooping at the tip, yellowish-green, generally with red or orange margins, slightly glaucous below, point acute, flower-stalk small, 4 feet to 8 feet high, and $\frac{1}{2}$ inch to 1 inch in diameter; pod short, erect, fibre very good, soft and glossy. Plant seldom more than 5 to 6 feet in height, grows generally on clay hills.

Tihore. Leaves stiff, erect, narrow, never drooping at the tip, olive-green, glaucous below; points very acute, or cuspidate, pink at the butt; flower-stalk 9 feet to 10 feet high, and 1 inch in diameter. Seldom flowers and still more rarely seeds. Plants seldom over 6 feet in height. Grows in rich dry alluvial land, never in swampy places. I have never seen it except where planted by the Maoris. I have here applied

the name to that variety called "Tihore" by the Maoris throughout the Waikato, and which is probably identical with the "Oue" and "Tapato." It is best distinguished by its narrow, tapering, sharp pointed leaves and erect close habit. It grows so thickly together that I obtained 186 sets for planting from two bushes.

Phormium tenax that grows on high or dry ground, though smaller is in general finer and more easily stripped than that found in swamps. Colonial rope spinners prefer it and are willing to give a higher price for it on this account.

The above descriptions are somewhat difficult to follow, as far as identification is concerned. Unfortunately, no care has been taken to retain the names of the varieties introduced here. They have been planted indiscriminately, as they are for scenic effect only.

PROFITABLE NATURE OF THE INDUSTRY.

The Minister of Agriculture, the Hon. George Swinburne, M.L.A., when visiting New Zealand recently, gave this matter attention. He gives an instance of one land proprietor receiving £9 per acre as royalty for the privilege of cutting leaves from his land. One instance is given in Sir James Hector's publication of 12s. per ton being paid as royalty for green leaves, so that, at the rate of 12s. per ton, and taking the yield at 15 tons per acre, this would give a return of £9.

These figures, possibly, are exceptional. Many instances are recorded of good returns being obtained from the yield of leaves without any effort on the part of the proprietor, and, with proper care in selecting the best varieties in planting, equal or better results could be obtained here.

The value of this industry may be estimated by the latest returns published of the imports of fibre and cordage into Victoria:—

Fibre from all sources	...	...	£79,266	0	0
Cordage, binder twine, &c.	...	...	41,241	0	0
			<hr/>		
Total			£121,207	0	0
			<hr/>		

The exports of Phormium tenax from New Zealand totalled £730,803, of which the imports to Victoria of fibre amounted to £25,590, and of cordage and twine to £5,929. The average price of fibre exported from New Zealand during 1905 was £25 17s. 6d. per ton.

CONCLUSION.

In advocating the cultivation of this valuable fibre-producing plant, I feel confident that there is a great future for it, as the growing demand for this class of fibre is considerable. Binder twine alone would justify it being taken up in this State. But every care should be exercised in entering upon this industry, and none but the right class of plants secured, as a mistake in this respect would seriously retard its development.

Large tracts of suitable land are available for this purpose, and beyond preparing, fencing, and planting, nothing further is needed, except an occasional stirring of the soil. Many of our capitalists, no doubt, would be prepared to take up this matter, if encouraged by some special condition by way of securing land for the purpose. The inquiries for information concerning this matter lead me to believe that something will be done in the way of planting before long, and it would be a mistake to neglect the best advice and assistance available."

 CURCUMA LONGA, LINN. "TURMERIC."

It has frequently occurred to me that for small farmers the cultivation of this plant might prove profitable, especially so as there must now be a large quantity of it used in the colony. I therefore take the liberty of inserting an article on this plant which appeared in the *Jamaica Bulletin* of July, 1906.

Turmeric is extensively cultivated all over India for its root-stocks, and is now found more or less wild in Jamaica, especially in the western districts. It is the well known "haldi" universally used as a condiment with curry-stuffs and also as a dye, and is one of the most profitable of crops in India. The dye-yielding rhizome is harder and much richer in colour than the edible.

CULTIVATION.

The preparation of the soil necessary for turmeric is similar to that of ginger, but land intended for turmeric need not be worked so fine. The usual planting time in India is about the 20th May. The plants spring up in about a fortnight. One or two weedings are necessary, and care must be taken that the fields are not inundated. After about a year and nine months turmeric is lifted. When it is raised the first year, as is the practice in some places, the produce is less in quantity and inferior in quality.

PREPARATION OF THE ROOT-STOCK.

Various systems are apparently practised for preparing the rhizome for the market. Of Bengal it has been said: "After the rhizomes have been dug out of the ground, they are freed from the fibrous roots and cleaned. They are then put in earthen pots, the mouths of which are to be carefully closed with earthen covers and cow-dung. These pots are then carefully heated. The turmeric is made to boil in its own juice, a process which gets rid of the raw smell of turmeric. It is then dried in the sun, the drying taking nearly a week, during which the turmeric requires to be covered in the night to protect it from the dew. In some places turmeric is boiled in water in which a little cow-dung is mixed."

Of the north-west provinces, Sir E. C. Buck says: "When dug up the roots are boiled and dried in the sun; in this form they are the turmeric sold in the Indian bazaars. When the dye is to be used the roots are again boiled and powdered while wet. A decoction is then made of this paste in water, in which the cloth is well steeped, being subsequently dried in the shade. In the Kumaon district the roots are soaked in lime juice and borax before being powdered instead of being boiled." Of the Punjab, Mr. Baden Powell says: the tubers are taken up in November and dried partly by the action of fire and partly by exposure to the sun. Of Coimbatore it is reported:—The roots are carefully sized and separately boiled in a mixture of cow-dung and water, dried and sent to market."

CHARACTER AND VALUE IN COMMERCE.

There are two sorts of turmeric seen in commerce—the round and the long, but both are the produce of the same plant; the central rhizomes or root-stocks constituting the round, and the lateral or secondary rhizomes (tubers) the long; the latter are the more abundant. The former are roundish or somewhat ovate, usually from about one inch and a half to two inches in length, and one inch in diameter, pointed at one end, and marked externally with annular ridges. They are often cut into halves. The latter are somewhat cylindrical, more or less curved, pointed at the two extremities, frequently having on their sides one or more short knobs or shoots, about the thickness of the little finger, two or three inches long, and marked externally with annular ridges. Both sorts are yellowish externally, very hard and firm, and when broken having a wavy-resinous appearance, and an orange-yellow or reddish-brown colour. The powder is orange-yellow. Turmeric has an aromatic taste and odour somewhat resembling ginger, but peculiar. When chewed it tinges the saliva yellow.

The following quotation from the Market Report published in the *Chemist and Druggist* for 23rd September last:—

Good Madras finger has been sold at from 17s. to 17s. 6d. per cwt., being steady, and Cochin split bulbs are quoted at from 7s. 6d. to 8s. per cwt., according to quantity.

DYE.

A special form of turmeric is grown for this purpose, namely, a harder root, much richer in the dye principle than in the ordinary condiment form.

The colour is only deposited in the rhizomes with age, and hence, in all probability, the above mentioned forms have been obtained by a process of careful selection of stock observed to produce the colour freely. It is of importance, however, that the European merchant, in purchasing for dye purposes, should see that he gets the hard dye-yielding form and not the softer aromatic condition, which is used as a condiment.

The rhizome is still largely used by the European dyers, though the fluctuation in the trade may be viewed as due to the development of the aniline industry. Professor Hummel says of it:—"Notwithstanding the very fugitive character of the colour it yields it is much used, especially by the wool and silk dyers for the production of compound shades—olives, browns, &c. It gives a bright yellow colour without the aid of a mordant, but when mordants are used with it, it yields other colours not unlike those obtainable from the yellow dye-woods. The colouring matter of turmeric is one of the few for which cotton has naturally a strong attraction."

Although turmeric is rich in colouring matter, its want of permanence is a hindrance to its application as a dye-material.

Some time back the use of turmeric was almost exclusively limited to printing and dyeing silks. It is now employed to a vast extent in stuff-dyeing, forming an important constituent in certain compound colours, especially the so-called "sour-browns."

FOODS.

Turmeric forms one of the indispensable ingredients in curries, and is used for colouring confections, &c.

MEDICINE.

Turmeric contains about one per cent. of a volatile oil, to which its odour is due, some starch, a yellow colouring matter called curcumin, and other unimportant substances. The

alkalies change the colour of curcumin to reddish brown; and boracic acid produces an orange tint; hence paper tinged with tincture of turmeric is largely employed as a test of the presence of alkalies.

Turmeric is not now used as a medicinal agent, but is introduced into the pharmacopoeias as a test of the presence of alkalies. For this purpose the British Pharmacopoeia directs unsized white paper to be steeped in tincture of turmeric and dried by exposure to the air. It is also occasionally employed in pharmacy in colouring ointments and other preparations.

Used as a stimulant in native medicine in India; externally applied in pains and bruises, and internally administered in disorders of blood. Its use as an external applicant in bruises, &c., is perhaps its most frequent medicinal application. The fresh juice is said to be an anthelmintic. A decoction of the rhizome is applied to relieve catarrh and purulent ophthalmia.

Cryptostegia madagascariensis, Boj. In my last Annual Report I alluded to this plant which had been suggested as a source of rubber, and to a new method which had been proposed for extracting it. About this method I have no further information, but I find that samples of rubbers obtained from *C. grandiflora*, R. Br. have been sent home for analysis from India, and I copy the report upon them from the Journal of the Agri-Horticultural Society of Western India.

REPORT ON THE RUBBER OF *CRYPTOSTEGIA GRANDIFLORA*,
from the Bombay Presidency.

BY PROFESSOR WNYDHAM R. DUNSTAN, M.A., F.R.S.

This sample of rubber was forwarded to the Imperial Institute, by Mr. G. A. Gammie of the Ganesh Khind Botanic Gardens with a letter D.O. No. 489 of the 5th January, 1906, in order that its quality and commercial value could be ascertained. It was stated that the climbing plant, *Cryptostegia grandiflora*, from which the rubber was obtained, is very common in the Bombay Presidency, and if the product is of marketable quality large supplies could be obtained.

Description of Sample.—The sample weighed about 13 ounces and consisted of a large porous lump of rubber which had been formed apparently by the aggregation of thin sheets and scrap. It was dark coloured, slightly sticky, and contained a large quantity of vegetable and mineral impurities. The rubber exhibited very fair elasticity and tenacity.

Results of Examination.—The rubber was examined in the Scientific and Technical Department of the Imperial Institute and found to have the following percentage composition :—

Moisture...	...	...	...	3·6
Caoutchouc (true rubber)	...	...	...	64·3
Resin	...	...	...	10·1
Albuminoid matter	...	...	...	7·9
Insoluble matter (including ash)	...	...	...	14·1
				<hr/>
Ash	...	...	...	8·22
				<hr/>

The percentage of resin and albuminoid matter are both a little high, but the chief defect of the rubber is the presence of the large amount of insoluble matter consisting of vegetable and mineral impurities. The presence of mineral impurity points to the contamination of the rubber, possibly the scrap rubber present in the sample, by contact with the soil, and precautions should be taken to avoid this in future. The percentage of caoutchouc is rather low, but this is chiefly due to the excessive amount of the impurities contained in the present sample.

Two specimens of the rubber of *Cryptostegia grandiflora* from India were examined at the Imperial Institute in 1903. A specimen forwarded by the Secretary of the Agri-Horticultural Society, Teynampett, Madras, was analysed and the dry material was found to contain 7·9 per cent. of resin and 2·6 per cent. of insoluble impurity. A second sample from Jalaum, which was rather inferior in physical characters, contained 9·0 per cent. of resin and 6·5 per cent. of insoluble impurity. Both these specimens therefore contained less resin and insoluble impurity than the present sample from Bombay. The amount of resin in the rubber may vary with the age of the plants, a larger percentage being present in the products from young vines.

Commercial Valuation.—A sample of the rubber was submitted for valuation to brokers who reported that it was rather sticky and slightly heated, and would probably be worth 3s. 6d. per pound in London at the present time. For comparison with this valuation it may be stated that the current value of fine hard Para from South America (the market standard for price) was 5s. 4d. per pound.

Conclusion and Recommendations.—The investigation has shown that this sample of the rubber of *Cryptostegia grandiflora* from Bombay is of very fair quality, and there is little doubt that the carefully prepared product would sell readily in

the market at remunerative prices. The elimination of the vegetable and mineral impurities would considerably improve the quality of the rubber.

In view of the statement that large supplies of this rubber are available it is suggested that a trial consignment of one or two hundred weights should be prepared and forwarded to the Imperial Institute for sale in London so that its commercial value can be definitely ascertained.

(Signed) WYNDHAM R. DUNSTAN,

Director.

The genus *Cryptostegia* includes two species only, the one reported on as above and *C. madagascariensis* which we have in the Gardens, and which is a native of Madagascar. The difference between the two species appears to be very slight, and the habit the same, though the Madagascar species seems to be only known from garden specimens. Where our plant came from I am unable to discover, it has been in the Gardens for many years, and has no special attention; whether its cultivation would be profitable or not must be a matter for experiment.

Hevea braziliensis, Mull Arg. I have long been of opinion that this tree is not at all likely to succeed in any part of Natal known to me. Some people are, however, of a different opinion, and entertain sanguine hopes of the likelihood of its success in the rubber-growing districts of Zululand, and they are evidently encouraged in that belief by the fact that it had been publicly stated that at the Transvaal Government Experiment Station, at Fzaneen, which has a climate and rainfall very similar to that of Durban, plants $6\frac{1}{2}$ inches in height in January have reached $5\frac{1}{2}$ feet in June, and some time ago it was said that they had reached 15 feet in height. This is so different from our experience of the behaviour of the plants here, that one is inclined to think that there must be a mistake somewhere. In February, 1906, we received from Cedara a few seeds of this tree, some plants were reared in a frame, and soon reached to 12 to 18 inches in height, they were put out in February, and now in June some of them are already dead, while those alive are not yet 2 feet high. They may possibly survive the winter, but I have no hope of their ultimate success. How this can be explained I am at present at a loss to know. I have learned that two other persons in the coast districts have had almost the same experience, the seeds germinated, the young plants lived for some time, but are now all dead.

PUBLICATIONS RECEIVED.

REPORTS.

- Royal Botanic Gardens, Ceylon.
 " " " Jamaica.
 " " " Calcutta.
 Botanic Gardens, Straits Settlements.
 " " " Saharunpur.
 " " " Grenada.
 " " " Maritzburg.
 " " " British Guiana.
 " " " Missouri.
 " " " Gold Coast.
 " " " and Forest Department, Hong Kong.
 " " " and Parks, Mysore.
 " " " and Government Domain, Sydney, N.S. Wales.
 " " " and Museum, Zurich.
 Field Columbian Museum, Chicago.
 Pharmaceutical Society's Museum.
 Smithsonian Institute, U.S. America.
 Director of Experiment Farms, Canada.
 Administration Reports, Ceylon.
 State Institute, Hamburg, 1902-3-4.
 Porto Rico Agricultural Experiment Station.
 Chemical, G. Merck.

BULLETINS.

- Straits Settlements, Agricultural, current Nos.
 Jamaica, current Nos.
 West Indian, current Nos.
 Kew, current Nos.
 New York Botanic Gardens.
 Trinidad.
 Haarlem, Kolonial Museum, No. 35.
 Philippines (Press), Nos. 8 and 9.

JOURNALS.

- Cape of Good Hope Agricultural, current Nos.
 Natal Agricultural, current Nos.
 Victoria Agricultural, current Nos.
 Agricultural and Hort. Society of India, July to December, 1905.
 Royal Horticultural Society, (Wood).
 West India, to March, 1906.
 Liverpool University, Vol. I, No. 3.
 Linnean Society, Vol. XXXVII, No. 262, (Wood).
 Transvaal, current Nos.

PROCEEDINGS.

Madras, Agricultural and Horticultural Society, 1906.

VARIOUS.

Royal Gardens, Kew.

Flora capensis, Vol. IV, Section 1, Part 3.
 New Philippine Acanthaceae, by C. B. Clarke.
 Icones Plantarum, Vol. IX, Part I.

United States of America.

Experiment Station Record, current Nos.
 Our Plant Immigrants, R. D. Fairchild.
 The Genus *Ptelea* in United States and Mexico, by E. L. Greene.
 Vegetable Growing in Porto Rico, by H. C. Henrichsen.
 Flora of the States of Washington.
 Studies of Mexican and South American Plants, by J. N. Rose.
 Fertilisers, by D. W. May.

California University.

A New Method of Making Dry Red Wine, by E. T. Broletti.
 Mosquito Control, by H. J. Quade.
 Commercial Fertilisers, by Geo. Roberts.
 Selection of Seed Wheat, by G. N. Shaw.
 Analysis of Paris Green and Lead Arsenate, by G. E. Colby.
 Resistant Vineyards, by F. F. Broletti.

Commissioner of Agriculture, West Indies.

Agricultural Bulletin, current Nos.
 Manual Experiments with Sugar Cane in Leeward Islands, 1906.
 Agricultural News, West Indies, current Nos.
 Tobago, Hints to Settlers.

Agricultural Department, Philippines.

A Compilation of Notes on India Rubber and Gutta Percha.
 Cultivation of Maguey in the Philippine Islands, by H. J. Edwards.
 Control of Rinderpest.
 Caroline Golden, Rice and Miscellaneous Notes.
 Press Bulletin, Nos. 8 and 9.

Borroughs, Wellcome & Co.

Chemical Examination of "Ko Sam" Seeds, *Brucea sumatrana*.

Chemical Examination of *Gundelia*; *Aethusa cynapium* and *Pittosporum undulatum*.

The Constitution of Umbellutone.

Some new Tropeines.

London Botanic Gardens, by P. E. F. Peredes, F.L.S.

Imperial Botanic Gardens, St. Petersburg.

Acta Horti Petropolitani, Vol. XXIV, Fasc. 111, Vol. XXV, Fasc. 1, Vol. XXVI, Fasc 1.

Royal Botanic Gardens, Ceylon.

Experiments in Bleaching Wet Rubber, by J. C. Willis and M. K. Bamber.

Bud Rot of Cocoa Nut Palm, by F. Petch.

The Spotted Locust, by E. E. Green.

Cotton, by C. J. C. Nee and J. C. Willis.

Fruit Cultivation in Ceylon, by H. F. McMillan.

Root Disease of *Hevea braziliensis*, by T. Petch.

Professor E. de Wildeman.

Mission of Emile Laurant, 1903-4. Illustrated.

Notices sur des Plantes utiles ou interessantes de la Flore du Congo, Vol. II, Fasc 1.

Flora of Lower and Middle Congo, by E. de Wildeman. Illustrated.

C. G. Lloyd, "Lloyd Library."

The Tylostomeae, Illustrated, by C. G. Lloyd.

Mycological Notes, current Nos., Illustrated, by C. G. Lloyd.

The Nidulariaceae "Birds Nest" fungi, illustrated, by C. G. Lloyd.

R. T. Baker, Esq., F.L.S., Sydney.

An Undescribed Species of *Cryptocarya* from East Australia, by R. T. Baker.

An Undescribed Species of *Leptospermum*, by R. T. Baker.

On two Species of *Eucalyptus*, *E. Carmea* and *E. Thozetiana*, by R. T. Baker.

Vitis opaca, F. v. M. Chemical Investigation of its enlarged Rootstock, by R. T. Baker and H. C. Smith.

Eucalyptus Staigriana, F. v. M. and its essential Oil, by R. T. Baker and H. G. Smith.

Australian *Melaleucas* and its essential Oil, by R. T. Baker and H. G. Smith.

Botanic Gardens, Hamburg.

Information from State Botanical Institute, Parts XIX, XX, XXI, XXII.

Hamburgische Elb Research.

On the Botrytis Disease of Tulips.

On the Fertilisation of *Daphniphyllum*.

On some Imperfect Fungi belonging to the Ascomycetes.

Observation on the new *Rhynchosporum grammicola*.

On the Control of Seeds.

On the Relationship of Englers Rosales, Parietales, Mytiflorales and other Orders of Dicotyledons.

On the Botanical Institute of Hamburg.

Twenty Pamphlets on Botanical Subjects.

Various.

Gleanings in Bee Culture. A. J. Root Co.

Pharmaceutical Journals, current Nos. Pharmaceutical Society.

Disease of Sweet Potatoes in Alabama, by E. Mead Wilcox, Ph. D. Author.

Praenunciae Bahamensis, by C. F. Millspaugh, Field Columbian Museum.

Seven Pamphlets on various Agricultural Subjects, by Prof. J. B. S. Norton. Author.

Berichte über Land und Forstwirtschaft in Deutsch Ost Africa. German Government.

Notes on *Fusicladium* on Apples and Pears in Cape Colony, by J. B. Pole Evans, B.A.B. Sc. Author.

Botanisches Jahrbuchern, 2 Parts, by Prof. Dr. Engler. Dr. G. Hoffman.

Sketches of Vegetation at Home and Abroad, by F. E. Weiss, D. Ch., and R. H. Yapp, M. A. Prof. Weiss.

En cultivo del Olivo, by F. Albert. Author.

La Replantacion de los Cerros Aridos del Pais por Federico Albest.

Catalogue of Aburi Botanic Gardens. Liverpool University.

Catalogue of Madagascar Plants, by Prof. Palacky. Author.

Mercks Specialities. Author.

La Tribune Horticole. Publishers.

Sundry Pamphlets on Botanical Subjects. A. J. Ewart, F.L.S.

Use of Violet Leaves in Medicine, by H. Wippell Gadd, F.C.S. Author.

Notes from Royal Botanic Gardens, Edinburgh. Director.

Die Gattung *Aptosimum*, ined, *Peliostomum*, E. M. Prof. Dr. Hans Schinz.

- Los Servicios de Aguas i Bosgues por Federico Albert.
 Beitrage zur Kenntniss der Pfantzenformationen von
 Transvaal und Rhodesia, by Prof. Engler. Author.
 Notes on South African Cycads, by H. H. W. Pearson,
 F.L.S. Author.
 Revision of Bersama, by E. G. Baker. Author.
 Catalogue Garden of Aclimatization of Gilbert Borromeo.
 Author.
 Contribution to Flora of Australia, by A. J. Ewart. Author.
 Physiologist of the 17th Century, by A. J. Ewart. Author.
 Cape Analytical Notes. Evans & Co.
 Cape Characeae, by H. J. Groves, F.L.S. Author.

Purchased.

Journal of Botany; Gardeners Chronicle; Tropical Agri-
 culturist; Journal of Mycology; Quarterly Journal of
 Liverpool University.



Abstract of Meteorological Observations for Year ending 30th June, 1907.

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

Reading 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.

	1906.		1906.		1906.		1907.		1907.		1907.		1907.		Year.															
	July.		Aug.		Sept.		Oct.		Nov.		Dec.		Jany.		Feby.		Mar.		April.		May.		June.		Year.					
	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.	In.	Deg.		
Barometer—Highest ...	30.630		30.717		30.504		30.502		30.364		30.362		30.265		30.279		30.388		30.455		30.374		30.617		30.717		30.717		30.717	
Lowest ...	29.983		29.639		29.801		29.824		29.664		29.572		29.768		29.709		29.762		29.792		29.810		29.824		29.572		29.824		29.572	
Mean, 9 a.m.	30.312		30.227		30.195		30.153		30.091		30.007		30.020		29.983		30.078		30.145		30.131		30.298		30.137		30.298		30.137	
Thermometer in Shade—		Deg.		Deg.		Deg.		Deg.		Deg.		Deg.		Deg.		Deg.		Deg.		Deg.		Deg.		Deg.		Deg.		Deg.		
Highest ...	81.0		95.9		80.4		84.9		86.2		89.3		90.7		90.0		89.1		84.2		87.3		83.5		85.9		83.5		85.9	
Lowest ...	46.1		47.0		54.4		53.3		55.1		60.3		63.2		64.1		62.1		57.6		41.1		46.3		41.1		46.3		41.1	
Mean, 9 a.m.	61.5		64.2		67.3		69.0		73.8		74.6		77.2		78.0		76.2		68.7		65.3		60.3		69.7		65.3		69.7	
Mean Reading of	74.8		75.6		74.0		75.2		78.2		81.5		82.8		84.1		83.7		77.4		75.4		74.4		78.1		74.4		78.1	
Maximum Thermometer	52.9		54.1		59.1		60.1		64.1		66.0		68.4		69.6		68.2		62.2		58.3		52.4		61.3		52.4		61.3	
Minimum "		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.		In.
Rainfall in inches ...	28		27		3.84		7.33		3.19		6.96		3.02		4.06		1.96		9.39		.73		.34		41.37		.34		41.37	
No. of days on which	No.		No.		No.		No.		No.		No.		No.		No.		No.		No.		No.		No.		No.		No.		No.	
rain fell ...	6		5		13		19		19		19		22		16		14		19		12		6		170		6		170	
Wind—Mean Force of ...	.91		1.33		1.26		1.03		1.32		1.24		.98		1.05		1.02		.88		.80		.80		1.05		.80		1.05	
Cloud—Mean Amount of	1.99		2.96		4.69		5.96		5.77		5.86		5.65		4.68		4.42		5.04		3.58		1.80		4.37		1.80		4.37	

DURBAN BOTANIC SOCIETY.

Receipts and Expenditure for the Year ending June 30, 1907.

RECEIPTS.

Balance in Bank 30th June, 1906	... £329 9 5
Sale of plants	... 1,937 16 6
Government Grant...	... 350 0 0
Herbarium	... 300 0 0
Subscriptions and Donations	... 245 17 3
Rent of Tea Room	... 2 0 0
Sale of Guide Books	... 0 10 0
Amount due to Treasurer	... 0 3 0
	£3,165 16 2
	£3,165 16 2

EXPENDITURE.

European Salaries and Wages	... £1,482 0 0
Native and Indian Wages	... 599 10 0
Rations and Fodder	... 176 9 6
General Maintenance	... 581 12 9
Herbarium Department:	
Salaries	... 210 0 0
Postages	... 9 3 2
Balance in Bank 30th June, 1907	... 107 0 9
	£3,165 16 2
	£3,165 16 2

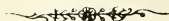
Examined and found correct; Vouchers produced
and in order; Bank Balance compared and
agreed.

GEO. BURGESS,
Secretary.

R. P. McNAIR,
Incorporated Accountant, Eng.,
Auditor.

23rd August, 1906.

Colonial Herbarium.



REPORT

—FROM—

July 1st, 1906, to June 30th, 1907,

—BY—

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

Corresponding Member of the Pharmaceutical Society
of Great Britain.

DIRECTOR OF BOTANIC GARDENS,

DURBAN.

COLONIAL HERBARIUM.

During the year which ended on the 30th June, 1907, the specimens in the Herbarium have been increased from 35,945 as stated in my last Report to 39,160. Of these 11,520 are South African and 37,640 from other countries, and there are two parcels from abroad not yet ready for mounting, and others are expected.

Specimens have been received in exchange as under:—

E. M. Reineck	...	Germany	...	690
C. G. Pringle	...	Vermont	...	1,308
M. Guadagno	...	Naples	...	328
Dr. R. Schlechter	...	Berlin	...	232
E. E. Galpin, F.L.S.	...	Queenstown	...	65
J. H. Maiden, F.L.S.	...	Sydney	...	100
M. Petitmengen	...	France	...	210
E. Mouillefarine	...	France	...	302
Royal Botanic Gardens	...	Mauritius	...	56
F. M. Reader	...	Australia	...	52
A. J. Ewart	...	Australia	...	84
				<hr/>
				3,427

The specimens received from E. E. Galpin, F.L.S., are especially valuable to us, as they represent South African plants, and being collected at high altitudes, were nearly all new to us, and the large collection received from Mr. C. G. Pringle, were Mexican specimens, many of which were newly described species.

Specimens have been sent away as under:—

Prince Roland Bonaparte	...	Paris	...	20
Dr. H. Bolus, F.L.S.	...	Capetown	...	102
E. E. Galpin, F.L.S.	...	Queenstown	...	102
E. M. Reineck	...	Germany	...	500
C. G. Pringle	...	Vermont	...	310
J. Macoun	...	Canada	...	90
M. Guadagno	...	Naples	...	226
Yu Shun Kudo	...	Japan	...	178
E. Mouillefarine	...	France	...	121

A. J. Ewart, F.L.S.	...	Melbourne	...	...	207
F. M. Reader	...	Australia	...	...	105
Royal Botanic Gardens	...	Turin	...	...	100
J. H. Maiden, F.L.S.	...	Sydney	...	...	84
J. Petitmengen	...	France	...	...	202
					2,347

With the exception of those sent to Prince Roland Bonaparte at the request of our Government, all the specimens sent out are natives of Natal.

During the whole of the past year my two assistants and myself have been fully employed. A large number of specimens have been examined and sent to correspondents, and there still remain many of the older collections which have to be examined and placed in the Herbarium or in the boxes for exchange. A Card Index to all South African plants represented in the Herbarium has been completed, and is now in working order; this will not only save much trouble, but will also be instrumental in saving the specimens from damage by unnecessary handling. To prepare a similar Card Index for the foreign specimens, while quite advisable, is a work which we cannot at present undertake.

A number of specimens have been sent to us for identification and information. The following is a list of the most important of them.

SPECIMENS EXAMINED.

1. Identification of a specimen of a tree from Cape Colony which proved to be *Schotia speciosa* (Jacq.) the "Boerboom" of the Colonists, the unripe legumes are roasted and eaten by the natives, and the bark has been used for tanning.

2. Identification of an Orchid from Zululand which proved to be *Eulophia speciosa* (Bolus).

3. Identification of a grass, *Eleusine indica* (Gaertn). This grass is figured and described in "Natal Plants," Vol. V, Part 2, Plate 439. The sender extols it as a valuable pasture and fodder grass for the upper districts, and says that "cut when in full seed it makes the best of hay," also that "cattle will eat it when as dry as chips," and on a misty morning will leave other grasses for it.

4. Identification of specimen of *Emex australis* (Steinh) erroneously supposed to be poisonous to cattle.

5. Identification of four specimens of indigenous plants collected in the midland districts,

6. Identification of a specimen of grass which was thought to be poisonous to cattle. It proved to be *Dactyloctenium ægyptiacum* (Willd) which is a good grazing grass, and quite harmless to cattle.

7. Identification of an indigenous and useless weed *Gnaphalium purpureum* (Linn).

8. Identification of flowers and leaves of a tree *Schotia brachypetala* (Sond) with information as to the value of its timber.

9. Identification of four specimens of indigenous plants from the midlands.

10. Identification of seven indigenous plants from the midlands, one of them being very rare.

11. Identification of a specimen of an indigenous grass from the midlands, which proved to be *Lolium multiflorum* (Lam).

12. Examination of seed vessel which proved almost certainly to be that of an *Eriodendron*, not an indigenous tree, the woolly substance contained in the pod is used for stuffing pillows, &c., and has some commercial value. It is popularly known as "Kapok."

13. Examination of three indigenous plants from the midlands which were of botanical interest only.

14. Identification of nine indigenous plants, and two cultivated ones from the midlands.

15. Identification of nine species of plants from Transvaal, four of which were not in our collection.

16. Identification of an imported weed from the midlands, which proved to be *Erodium moschatum* (Willd) a native of Cape Colony, but not previously gathered in Natal to our knowledge.

17. Identification of two indigenous plants; the specimens sent were very imperfect, but the plants were *Eulophia ensata* (Lindl) and *Moræa* sp.

18. Examination of a plant which was thought to be "Wild Indigo," but which proved to be a species of *Tephrosia*, the specimen was incomplete.

19. Identification of two fungi, *Phallus indusiatus* (Vent), and *Kalchbrennera Tuckii* (Berk).

20. Identification of seed of *Telfairia pedata* (Hook), with information as to its value for extraction of the oil, and also of its adaptability to the soil and climate of Natal.

21. Examination of a plant which was thought to be a moss, but which proved to be a species of *Sedum*, an imported plant.

22. Identification of three indigenous plants from the upper districts. Instructions for sending specimens for identification forwarded.

23. Examination of a plant from the upper districts which was thought to be spreading. It proved to be *Monsonia ovata*, Cav. var. *biflora*, a well known remedy for some forms of dysentery. Information as to its properties was supplied.

24. Examination of a specimen of a plant which was supposed to be poisonous to cattle. It proved to be *Tribulus terrestris* (Linn), known popularly as "Devils Thorn," and to the natives as "Inkuzana." Except for its thorns it is quite harmless so far as known to us.

25. Identification of two plants which were supposed to be injurious to stock. They were *Hypoxis latifolia* (Hook), and *Ornithogalum virens* (Ldl), both of which are harmless so far as at present known.

26. Examination of two species of plants from Zululand, one being a *Sansevieria*, the other a *Salacia*, both are most likely new varieties or species.

27. Identification of a specimen of a plant supposed to be poisonous to stock. It proved to be *Moræa natalensis* (Baker), and though I know nothing as to the properties of this species it must certainly be regarded with grave suspicion, as several species of this genus are now known to be more or less harmful to stock. The plant is found in the midlands and from thence to the summit of the Drakensberg.

28. Identification of a plant which the sender stated appeared only in very wet seasons. It proved to be a fine terrestrial Orchid. *Disa crassicornis* (Ldl).

29. Identification of a grass which was suspected of being poisonous to cattle. It proved to be *Microchloa caffra* (Nees), and so far as known to us quite harmless.

30. Identification of two indigenous coast plants, both being without economic value.

31. Identification of a weed *Medicago hispida* (Gaertn), which was probably introduced, either with Agricultural seeds, or as suggested by the sender, in the wool of imported sheep. The plant is a native of Europe.

32. Identification of the fruits of *Ximenia caffra* (Sond), with information as to their properties.

33. Identification of a specimen of a plant *Riocreuxia torulosa* (DCne), with information as to its relationship and habitat.

34. Identification of two grasses, one being an imported one which had appeared amongst forage. It was *Bromus commutatus* (Schedr), the other was *Paspalum scrobiculatum* (Linn), which is known to be poisonous, but only when in seed.

35. Identification of five indigenous plants which were reputed to have medicinal properties.

36. Identification of fourteen indigenous plants from coast districts.

37. Identification of a plant thought to be of medicinal value. It proved to be *Leonotis mollissima* (Gurke). Several, if not all the indigenous species of this genus have been successfully used as a tonic for calves.

38. Identification of twenty-five indigenous plants, their native names were supplied by the sender.

39. Identification of seeds supposed to be useful for extraction of the oil which they contain, they proved to be the seeds of a shrub or small tree, *Jatropha curcas* (Linn). It is known as "Physic nut," and the oil obtained from the seed is a drastic purgative, and of little commercial value.

40. Identification of a weed found growing in some cultivated land amongst crops. It proved to be *Spergula arvensis* (Linn), a well known weed in Europe, and also in some parts of South Africa.

41. Identification of a rather rare grass, *Urelytrum squarrosum* (Hack) from upper districts, it is of little value as a pasture grass.

42. Identification of forty specimens of indigenous plants which were sent with their natives names.

43. Identification of an indigenous plant supposed to be poisonous to cattle. It proved to be *Senecio isatideus* (DC), and from its close relationship to *S latifolius* (DC), which has been proved poisonous to stock, it must be regarded with suspicion. It is not uncommon to the midlands and upper districts.

44. Identification of a plant said to be useful in cases of dysentery. It proved to be *Lessertia perennans* (DC), but I have no record of its properties.

45. Identification of two leaves, viz.: *Agave americana* and *A. americana*, variegated variety. These leaves contain a large amount of valuable fibre, but their great weight renders the plant unsuitable for economic cultivation.

46. Identification of a very imperfect specimen of a weed which is said to be spreading with rapidity in the upper districts. It proved to be a composite of the section *Senecionidæ*, but more complete specimens are required for complete determination.

47. Identification of three species of Orchids from the midlands.

48. Examination of twenty-one species of indigenous plants, and identification of seven of them. Most of the specimens were incomplete, and flowers absent. The native names were supplied by the sender.

49. Examination of forty specimens of indigenous plants, the specimens were very incomplete, but the greater number of them were identified and their names supplied to the sender.

50. Examination of a second and more complete specimen of No. 46. It proved to be *Senecio Burchellii* (DC), a plant which has been reported to be poisonous to stock. It is a native of the midlands and upper districts.

51. Identification of a plant found growing in cultivated land in the midlands. It proved to be *Malvastrum coromandelianum*, a native of S. America.

52. Identification of a specimen of *Indigofera arrecta*, (Bth). This is the species which is extensively grown in Java and India for the extraction of the pigment, and is considered to be one of the best, if not the very best species for the purpose. It is plentiful in coast and midland districts of Natal, and is known as "Umpekambedu."

53. Examination of twenty-eight specimens of plants from Transvaal, and identification of twenty-five of them. Several of them were not in our collection.

54. Identification of two specimens of indigenous plants from the midlands, which were probably, but erroneously thought to be fibre yielding plants.

55. Examination of leaves of a tree from midlands, most likely those of *Calodendron capense* (Thb.), but flowers are required to be quite certain.

56. Identification of a specimen of *Cryptostemma calendulaceum* (R. Br.) This plant is abundant in some parts of Cape Colony, but introduced into Natal, and apparently rare, since we have only met with it once. The sender says: "It stands frost well, in fact only flowers during the autumn and winter months. Stock eat it all right."

57. Identification of a grass *Bromus unioloides* (H.B.K.), with information as to its distribution and native country.

58. Examination of thirty-two specimens of indigenous plants and identification of nearly the whole of them. The native names were supplied by the sender.

59. Examination of specimen of an indigenous plant, and of the fibre extracted from it. The specimen had been damaged by post, and was therefore almost unrecognisable, but there is little doubt that it was *Sida rhombifolia*, L. The fibre was much discoloured, probably by over retting and the strength was not satisfactory, probably from the same cause. It is scarcely likely that the cultivation of this plant would be remunerative in Natal, though it is in coast districts a very common weed. It is known to the natives as "u-Vemvani."

60. Examination of twigs and leaves of an indigenous plant about which no information was given by the sender. By request a second specimen with young fruit was sent, and the plant proved to be *Kraussia floribunda* (Harv).

The following additions have been made during the year to our published list of Natal Plants, some of them being new species.

<i>Andropogon Schlechteri</i> , Hack	Gramineæ.
<i>Aristida atroviolacea</i> , Hack	"
<i>Panicum tunicatum</i> , Hack	"
<i>Mariscus pseudo-vestitus</i> , C. B. Clarke	Cyperaceæ.
<i>Eriocaulon Ruhlandi</i> , Schinz	Eriocaulaceæ.
<i>Crassula crenatifolia</i> , Baker	Crassulaceæ.
<i>Sebœa natalensis</i> , Schinz	Gentianeæ.
<i>Sebœa Marlothi</i> , Gilg	"
<i>Sebœa Rudolfii</i> , Schinz	"
<i>Exochaenium grande</i> , (E.M.) Gieseb. <i>Bel-</i>	
<i>montia grandis</i> , (E.M.)	"
<i>Plectranthus praetervisus</i> Briq	Labiatae.
<i>Bowkeria natalensis</i> , Schinz	Scrophularineae.
<i>Cliffortia natalensis</i> , J. M. Wood	Rosaceæ.
<i>Helichrysum argentissimum</i> , J. M. Wood	Compositæ.
<i>Gardenia cornuta</i> , Hemsl	Rubiaceæ.
<i>Anthanasia Thodei</i> , Bolus	Compositæ.
<i>Berkheya macrocephala</i> , J. M. Wood	"
<i>Carissa Wyliei</i> , N. E. B.	Apocynaceæ.
<i>Cliffortia prostrata</i> , Schlechter	Rosaceæ.
<i>Mimusops concolor</i> , Harv.	Sapotaceæ.
<i>Royena Simii</i> , O. Kuntze	Ebenaceæ.
<i>Helichrysum lepidissimum</i> , S. Moore	Compositæ.
" <i>obductum</i> , Bolus mss	"
" <i>Haygarthii</i> , Bolus mss	"
" <i>epapposum</i> , Bolus mss	"
" <i>oligopappum</i> , Bolus	"
" <i>opacum</i> , Klatt	"

<i>Moniera cuneifolia</i> , Michx	<i>Scrophulariaceæ.</i>
<i>Euphorbia Cooperi</i> , N. E. Br.	<i>Euphorbiaceæ.</i>
<i>Olinia micrantha</i> , Don	<i>Lythraceæ.</i>
<i>Kedrostis glauca</i> , Cogn	<i>Cucurbitaceæ.</i>
<i>Tryphostemma n. sp.</i>	<i>Passifloreæ.</i>
<i>Swertia Welwitschii</i> , Engler	<i>Gentianeæ.</i>
<i>Justicia anagalloides</i> , T. And	<i>Acanthaceæ.</i>
<i>Cineraria Haygarthii</i> , Bolus	<i>Compositæ.</i>

The following additions have been made to the Museum.

WOODS.

- Abnormal growth of tree near Bulawayo.
 Section of wood of Japanese tree with Japanese characters
 burnt upon it.
Dammara, sp, with gum in situ.
Excæcaria africana, Mull. Arg. "Umtamboti,"

FRUITS.

- Millettia caffra*, Meisn. "Umzimbiti."
Cæsalpinia Bonducella, Fleming.
Gymnema sp., from Transvaal, (Thorncroft 565).
Hyphæna crinita, Gaertn. "Ilala Palm."
Erythrina tomentosa, Buch. Ham. Natal.
Sterculia murex, Hemsl. Transvaal.
Azelia quanzensis, Oliv. East Coast.
Landolphia florida Bth. Zululand.
Sommeratia acida, L. F. Andamans.
Trachylobium Hornemannianum, Hayne. "Copal Tree."
Calodendron expense, Thb. Natal.
Schotia brachypetala, Sond. Natal.
Arachis hypogæa, L. Natal.
 " " Improved variety.
Salacia sp. " Zululand.
I rosopsis pubescens, Bth. Central America.
Pyrenacantha scandens, Planch. Natal
Khaya senegalensis, A. Juss. Rhodesia.
Acokanthera sp. Natal.
Cordia caffra, Sond. Natal.
Cola sp. Transvaal.
Ipomœa Saundersiana, Baker. Natal.
Crescentia cujete, L. South America.
Tabernaemontana elegans, Stapf. Delagoa Bay.
Eucalyptus Lehmannii, Preiss. Australia.
 ,, *platypus*, Hook. Australia.
 ,, *calophylla*, R. Br. Australia.
 ,, *Sieberiana*, F. v. M. Australia.
Dammara robusta, C. Moore. New Zealand.
Lodoicea sechellarum, Labill. Seychelles.

SEEDS.

- Entada scandens*, Bth. Natal.
Azelia quanzensis, Oliv. East Coast.
Raphia sp. Delagoa Bay.
Arachis hypogæa, L. Natal.
 " " Improved variety.
Millettia caffra, Meisn. Natal.
Atriplex holocarpa, F. v. M., adhering to Mohair. Transvaal.
Ipomœa albivenia, D. Don. Natal.

FIBRES.

- "Worsted" from Jute. (*Corchorus olitorius*, Linn).
 Cotton grown in Botanic Gardens.
 " " "Sea Island" grown in Natal.
 Fibre from stem of Granadilla.
 " " native plant unknown, from South Coast.
 " " *Sida rhombifolia*, L. Natal.
 " " *Sansevieria guineensis*, Willd. Natal.
 " " *Furcraea* sp, with portion of leaf. Natal.
 " " *Agave americana*, with portion of leaf. Natal.
 " " *Yucca* sp, with portion of leaf. Natal.

MISCELLANEOUS.

- Rubber or Ebonite, from *Euphorbia Tirucalli*, L. Natal.
 Rubber from Somkeli. Natal.
 " " St. Lucia Bay.
 Bark of *Simaruba glauca*, D. C. "Overland Bark."
 Twigs of a tree said to be poisonous to cattle.
 Flowers of *Mesembryanthemum* sp. Natal
 " *Ceropegia Sandersoni*, Dcne. Natal.
 " *Disa crassicornis*, Ldl. Natal.
 " *Hyphæne crinita*, Gaertn, with portion of inflorescence.
 " *Cotyledon orbiculata*, L.
 Mole Crickets.
 Roasted and Ground Coffee from *C. Zanguebariæ*.
Aecidium vanqueriæ on fruit of *Vanqueria infausta*, Burch.
 Wood pulp of Esparto grass.

The descriptions of several hitherto undescribed Natal plants have lately been published in the *Kew Bulletin*, but as that work is not seen by many persons in the Colony it will be as well to give them here, they are as follows:—

CLIFFORTIA NATALENSIS, J. M. WOOD.

An erect much branched undershrub with dark coloured bark; young branches and branchlets villous with brownish hairs, older glabrous; leaves chiefly on short but elongating branchlets, in tufts of 4-8, unifoliolate, subsessile, linear, flat, apiculate, obtuse at base, quite glabrous, 1-veined, thickly glandular on each side of the vein beneath; 6-lin. broad; stipules membranaceous, amplexicaul, 2-toothed, glabrous except for a small tuft of rusty hairs at base, 1-lin. long, very persistent, clothing the branchlets long after the flowers have fallen; female flowers solitary, subsessile in axils of leaves; bracts 2, semi-amplexicaul, equaling the flower, broadly ovate, acuminate; calyx limb 3-4-parted, tube in fruit hardened, substriate, somewhat wrinkled, $1\frac{1}{2}$ -lin. long; stigma broad, compressed, fimbriate on margins; male flowers not seen.

HABITAT.—Natal, near Curry's Post, 3-4000 feet alt., April, Wood 4449; Mount Gilboa, 5-6000 feet alt., September, J. Wylie, (Wood 10,029).

HELICHRYSUM ARGENTISSIMUM, J. M. WOOD.

Radical leaves densely rosulate, linear or linear-oblong, $1-3\frac{1}{4}$ in. long, $1\frac{1}{2}-2\frac{1}{2}$ lin. wide, subamplexicaul, narrowing to an obtuse apex, densely clothed (especially the younger ones) with white woolly matted hairs; cauline leaves similar but shorter and with hyaline glabrous 1-veined tips, the tip in the upper ones $\frac{1}{3}$ the length of the leaf, in the uppermost ones simulating the involucreal scales, in the lower ones much shorter; peduncles erect, 1-headed, up to 6 inches long, densely woolly; heads up to 1 inch diam., many flowered; involucreal scales in several rows, lanceolate, acute, spreading; 4-9 lin. long, the lowest $2\frac{1}{2}$ lin. wide, uppermost 1-lin. wide; all silvery white and shining, quite glabrous, and with transverse purplish-red marking above base, the basal portion thickened and of dark colour, receptacle pitted, fimbriiferous; corolla shortly 5-toothed, glabrous; pappus bristles deciduous, barbate, clavato-barbellate at apex; achenes (immature) turgid, glandular.

HABITAT.—Natal, open stony ground and in crevices of rocks, summit of Mount Gilboa, 5-6000 feet alt., September, J. Wylie (Wood 10,025).

The collector, Mr. Wylie, states that the plant grows in dense masses of 1-2 feet in diameter. It comes near to *H. album* (which we have not seen), but according to the description it differs in shape of leaves, and by its glandular achenes.

In age the lowest leaves become glabrous and dark shining brown beneath.

BERKHEYA (STOBCEA) MACROCEPHALA, J. M. WOOD.

Near *B. latifolia*, W. & E., but heads larger and solitary—not racemose-paniculate, and the involucre distinct.

A perennial herb with a hard woody root, 8-12 in. high. Stem softly hirsute, with very fine cobwebby wool. Basal leaves oblong, long attenuate at base, tapering to petiole, deeply pinnatifid, with 10-15 imbricate segments on both sides, the lobes rotundate, irregular, decreasing in size towards the base, spinous on the margin, spines $\frac{1}{2}$ - $1\frac{1}{2}$ line long; leaves including the petiole 14-18 in. long; 3-6 in. broad at first with scanty sub-cobwebby wool, which wears off; leaves on both sides sparingly softly hirsute; petiole interruptedly lobed-winged, upper lobes passing into the lobes of the lamina, the lower very minute. Cauline leaves few (6-7) narrow oblong or oblong lanceolate, amplexicaul, the lowest pinnatifid, the upper scarcely lobed, segments or lobes not imbricate, spinous margined, from $4\frac{3}{4}$ in. (lowest) to $\frac{3}{4}$ in. (highest) long; 2 in. to 5 lines broad. Heads solitary on the stems, cobwebby woolly at base, 4- $4\frac{1}{2}$ in. diameter; involucre bracts linear or lanceolate linear, 2 in. long by 3-1 in. broad, pungent at apex, spinulose on margins, rigid, prominently veined; receptacle very densely covered with very numerous linear-oblong lanceolate, spinulose-serrate palae. Florets yellow, numerous; rays a little longer than the involucre scales, acute at apex, 4-dentate; disk florets deeply 5 lobed, lobes linear acute. Achenes silky; pappus biseriata, paleaceous, palae oblong, obtuse or acute, lacerate, serrulate or subentire.

HABITAT.—Natal, Hillside, near Richmond in open ground, 1800-2000 feet alt.; October, 1906. Wood 10,031.

CARISSA WYLIEI, N. E. BROWN.

Near *C. grandiflora*, A.D.C, but of more slender habit, and with narrower leaves, and acute corolla lobes.

A dichotomously branching shrub, the whole corolla except the tube glabrous. Branches slender, $\frac{1}{2}$ - $1\frac{1}{2}$ lin. thick, spines very short or absent, simple or forked, $\frac{1}{2}$ -1 line long. Leaves on short petioles, 2- $4\frac{1}{2}$ inch long, $\frac{3}{4}$ - $2\frac{1}{2}$ inch wide, ovate or lanceolate, very acute, base cuneate or rotundate; petiole 1- $1\frac{1}{2}$ line long. Cymes terminal or axillary, subsessile, 5-6 flowered. Pedicels 2-3 lines long. Sepals 1- $1\frac{1}{2}$ line long, deltoid-subulate, acute. Corolla tube $4\frac{1}{2}$ -9 lines long, $\frac{3}{4}$ line diameter, cylindrical, interior pubescent; lobes $4\frac{1}{2}$ -5 lines long, 2 lines wide, lanceolate, acute, spreading.

HABITAT.—Natal, Zululand District, Ngye 100-200 feet alt. Wylie in Herb. Wood 7898.

HELICHRYSUM RETORTOIDES, N. E. BROWN.

Near *H. retortum*, Willd, but differs by its shorter, erect, and crowded branches, narrower and more clustered leaves, much smaller heads, and different indument.

Plant $2\frac{3}{4}$ -4 inches high. Branches erect, crowded, simple or sparingly branching above, woody, slender, densely leafy for their whole length. Leaves $2\frac{1}{2}$ -4 lines long, $\frac{1}{2}$ -1 line wide, linear-oblong, obtuse, clothed above with silvery compressed indumentum, or sub-glabrous, densely white tomentose beneath. Heads solitary, sessile $\frac{3}{4}$ inch long, cylindrical. Involucral scales in many series, glabrous, exterior ones ovate or lanceolate, subacute, red, interior ones longer, linear-lanceolate, obtuse, white. Flowers yellow, one-third the length of the involucre. Corolla $3\frac{1}{2}$ lines long, filiform-tubular, very shortly 5-toothed. Ovary very minutely papillose. Pappus scales shortly barbellate at apex.

HABITAT.—Natal, on the slopes of the Drakensberg 5,400-6,300 feet.

Wilson in Herb. Wood 8365.

The publication of the last Part of Vol. V of "Natal Plants" has been delayed waiting for the appearance in the *Kew Bulletin* of a description of a new grass, a species of *Agrostis*; all the drawings for the Part are already made, and when this description is published the volume will at once be completed and put into the printer's hands, Vol. II and V contain plates and descriptions of all the Natal grasses known to us, Vol. I, III and IV being confined to miscellaneous plants, and I regret to have to say that on the completion of Vol. V, the publication of this work will for the present at any rate cease, as under present circumstances the Government can scarcely be expected to continue the Grant that has been received in aid of its publication.

The "Handbook to the Flora of Natal," for the use of amateurs which has been for so long in hand has at last been published, and may be obtained from the local Booksellers, the whole cost has been borne by the Botanic Society, and it is hoped that it will be found to be useful to others as well as to students of botany, and serve to make the science more popular than it has hitherto been in Natal.

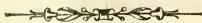
A list of the indigenous plants of the Colony with more precise information as to their localities, months of flowering and collectors numbers has been prepared, and is now in course of publication by the "South African Philosophical Society" of Capetown, copies of which will be obtainable by the public before the close of the present year.

Miss Franks, the Senior Assistant, having completed the drawings of the grasses to my entire satisfaction, is now engaged in identifying and preparing for distribution a large number of specimens which after collection have been laid aside in consequence of more pressing work; these specimens are now much needed as we are rather short of material in consequence of not having been able to collect during the late rebellion, but we hope to make larger collections during the present season.

J. MEDLEY WOOD,



NATAL BOTANIC GARDENS.



ANNUAL REPORT.



NATAL BOTANIC GARDENS, BEREA,

DURBAN, JULY, 1908.

TO THE PRESIDENT AND COMMITTEE,

NATAL BOTANIC SOCIETY.

GENTLEMEN,—In presenting as usual my Annual Report, I am pleased to be able to state that during the year now ended the weather has been most favourable, and I have no losses of consequence to report, the only one of importance being that of our only tree of *Cinnamomum cassia* reported on last year as having suffered by the bark having been removed from it by depredators, most likely Indians; it had begun to grow again, but was attacked for the second time, and the bark removed even from the roots, and it is now quite dead. During the greater part of the year we have been short-handed, and in consequence no work of importance could be undertaken; the main walks have been laid with ashes, which, though not the best material for the purpose is at any rate better than the ant-heap which was formerly used and which rendered the walks very unpleasant after rain.

In consequence of the very great reduction in the Government Grant no collecting trip could be undertaken this year; the staff both Europeans and coloured has been considerably reduced, and also the salaries of those that remain, so that all that can be expected at present will be the necessary routine work—improvements are out of the question.

The Tram line has now been extended to the Sydenham Road entrance to the grounds, and a tram is dispatched every half hour each way; the matter of its extension through the upper portion of the ground is still under consideration.

I regret to have to say that the behaviour of visitors is not always what it should be, plants have been stolen both from the ground and also from the Conservatory, labels removed from their places, and running down the grassed embankments is of frequent occurrence, usually but not always by children; the consequence being that when heavy rains occur the embankments are washed down into gutters causing considerable trouble in repairs.

During the year 407 packets of seeds have been received, and 933 packets have been sent away to correspondents, 567 plants and bulbs and 1,920 cuttings have been sent away, and 367 plants and bulbs have been received.

Large numbers of bulbils of *Agave rigida*, var, *sisalana* have been distributed to growers, at first without charge, but since the great reduction of the Grant we have been compelled to charge for them at current prices. Free Grants were made to the following:—

Loyal Women's Guild ...	...	...	£2	16	9
Durban Corporation ...	...	...	30	10	6
Women's Residential Club ...	...	...	2	14	0
Convalescent Home ...	...	...	3	0	0
Technical Institute (Hire) ...	...	...	1	1	0
Duban Home ...	...	...	1	15	0
Durban Light Infantry...	...	...	9	10	0
Natal Government Asylum ...	...	...	1	8	0
Durban and Coast Agricultural Society ...	...	...	9	0	0
			<hr/>		
			£61	14	6
			<hr/>		

In the Herbarium the specimens have been increased from 39,163 as stated in my last Report to 41,370; of these 29,390 are foreign and 11,980 are South African.

The 4th Part of Vol. V of "Natal Plants" has been published, and now as far as known all the indigenous grasses of the Colony are figured in this work. The Revised List of Natal Plants with the exception of the Order *Asclepiadaceæ* has been completed by the writer and published by the South African Philosophical Society, and a number of copies have been sent to our botanical correspondents.

A number of dried plants collected by Lindheimer between the years 1849 and 1851 have been distributed from the Missouri Botanic Gardens by the Director, Mr. W. Trelease, and about 340 specimens were sent to our Herbarium by him, and are now incorporated in the Herbarium.

As in former years a number of specimens of plants, chiefly indigenous, but some imported, have been sent to the Herbarium for identification, and in every case, when sufficient material has been sent, the names of the plants, and frequently information about them, has been supplied to the sender.

The Grant from Government to the Herbarium has been reduced from £300 to £175, the Junior Assistant, therefore, had to leave us, and in consequence the work cannot be got through as quickly as I could wish. The Grant of £130 per volume towards the publication of the work, "Natal Plants" has been withdrawn; five volumes of the work have been published, and it is a matter for regret that what is thought to be so useful a work should have to be stopped for the want of so small an amount, as each volume contains four Parts, and each Part would take at least a year to complete, an annual sum of £32 10s. would allow the work to be continued.

I submit the audited Balance Sheet for the year, and remain,

Your obedient servant,

J. MEDLEY WOOD,

DIRECTOR.



Natal Botanic Gardens.

ANNUAL REPORT.

NATAL BOTANIC GARDENS,

BEREA, JULY 1909.

TO THE PRESIDENT AND COMMITTEE,
NATAL BOTANIC GARDENS,
GENTLEMEN,

In presenting this, my 28th Annual Report, I regret very much that the state of the finances will not allow of a much fuller report being published as has been done for so many years until last year, when the grants were so much reduced that drastic retrenchments had to be made in this as also in other things connected with the upkeep of the Gardens and Herbarium. Our staff has been so much reduced in number that beyond the ordinary routine work nothing more could be attempted, the Conservatory requires considerable repairs, the wooden plant labels have become almost illegible, many of them have been broken and some removed by mischievous visitors, the enamelled ones do not stand the change of temperature and become chipped, and of the iron ones we have but very few. In consequence of the great reduction of the staff propagation of plants for distribution is almost at a standstill, and the stock in the Nursery is gradually being diminished; it is to be hoped that the next annual report will be written in a more cheerful strain.

It is, perhaps, unnecessary for me to say that the season has been a most favourable one for the growth of plants, and the Garden in spite of the adverse circumstances above stated has been at its best.

During the year I received from the Director of the Kew Gardens small bags of seeds of each of the two new species of *Manihot*, viz. *M.dichotoma*, and *M.piauhyensis*; a few of the seeds were sown here, the remainder divided equally between two planters, one of them reports that the seeds were bad and did not germinate, the other that he has now planted out 98 plants of *M.dichotoma* and 26 of *M.piauhyensis*; here from a smaller quantity of seed we have planted about 30 of *M.dichotoma* and 8 of *M.piauhyensis*; it is quite evident that a large proportion of the seeds were bad, and rotted instead of germinating. The plants that we have will be put out for trial and for seed bearing.

Amongst the plants received during the year two species are worthy of further notice here, the first *Pouteria Suavis* is a new fruit-bearing tree from Uruguay; it is said of it that "The fruit is about the size of an apricot, but the shape of an apple, it is yellow and scarlet when mature and possesses a perfume so delicate that it is equalled in no other fruit;" the edible fleshy part of the fruit is small, but is said to have remarkable digestive properties; the plants will be put out in the Spring, and it is hoped that they will succeed here.

We have also received from the United States Government plants of four varieties of Citrus, these are hybrids between *Citrus trifoliata*, and the common sweet Orange; they are doing well and will be propagated from if found advisable to do so; the fruits are scarcely recommended as table fruits, but they are seedless or nearly so, and are said to be very suitable for the manufacture of "ades," that is lemonade, orangeade, etc.

During the year 179 packets of seeds have been received, also seeds of 5 species of Palms in quantity, 593 packets of seeds have been sent to correspondents, 2255 plants and bulbs have been sent away in exchange, and 761 have been received.

Free grants have been made as under:—

	£	s.	d.
Durban and Coast Agricultural Society	9	0	0
Natal Government Asylum	1	8	0
H.M.S. "Good Hope."	2	2	0
Arts and Crafts Exhibition	3	3	0
N.G. Railways	1	1	0
	<hr/>		
	16	14	0

In the Colonial Herbarium the specimens have been increased from 41,370, as stated in my last annual report to 42,361, an increase of 991 specimens, but it must be remem-

bered that no collecting trip could be taken this year or the increase would have been greater, still many specimens are due to us, and will be received in due course. The first part of vol. VI of *Natal Plants* was published in May, and I hope shortly to commence the second part of the volume. The Revised List of the Order *Asclepiadaceae* which was omitted in the list published last year as stated in the preface has now been completed and will shortly be published by the Royal Society of South Africa, and it is to be hoped as a separate part, so that it can be bound along with the main portion of the Revised List.

Since the publication of the part of the *Flora Capensis* completing the Order *Asclepiadaceae*, my assistant Miss Franks has been engaged in going over the whole of our specimens of the Order; flowers of almost every specimen had to be dissected, since many of the species cannot be separated without careful comparison of the flowers; now, on one sheet of every species Miss Franks has affixed an enlarged drawing of the minute organs, the great differences which occur in them is the chief reason why the identification of these plants is so difficult; this work has now been very well done, and reflects much credit on Miss Franks as a botanical artist, and in comparing new additions to the Order it will not now be necessary to mutilate the specimens, many of which are types of the species.

Though as previously stated no collecting trip could be taken during the year, we have still a large number of duplicate specimens on hand, and parcels are being sent away to correspondents as time can be spared for the purpose, and parcels are received in exchange which after being examined and poisoned are added to the collection, but this, of course cannot last very much longer, and it would be most unfortunate if our exchanges should have to cease for want of material.

I submit the audited balance sheet for the year, and remain

Your obedient servant,

J. MEDLEY WOOD,
Director.

DURBAN BOTANIC SOCIETY.

Revenue and Expenditure for Year Ending June 30, 1909.

REVENUE.		EXPENDITURE.	
	£	s.	d.
Balance in Bank, July 1908	47	5	2
Sale of Plants	1520	8	5
Government Grant—Gardens	150	0	0
Do. Herbarium	175	0	0
Do. Publication			
of "Natal Plants"	65	0	0
Subscriptions and Donations	259	11	2
Rent of Tea Room	2	0	0
Refund by Indian Immigration Dept. of money deposited	6	0	0
	<u>2225</u>	<u>4</u>	<u>9</u>
European Salaries and Wages	800	0	0
Native and Indian Wages	324	6	0
Rations and Fodder	135	6	3
Printing "Natal Plants"	58	14	0
General Maintenance	339	13	11
Herbarium Department—			
Salaries	294	0	0
Maintenance	21	15	1
Balance in Bank, June 30, 09	249	13	4
Balance due by Treasurer June 30, 09	1	16	2
	<u>2225</u>	<u>4</u>	<u>9</u>

NOTE.—The increase in the Bank balance results from severe temporary reductions in salaries and wages and working expenses, and to cessation of expenditure for up-keep of buildings, and these conditions cannot continue.

Examined and found correct.

R. P. McNAIR,
Incorporated Accountant (England),
Auditor.

3rd August, 1909.