...vinces of ... in ...
the year 1890-91 by George King
Director of Botanical Survey of
India.

During the year the Government of India granted the sum of rupees one thousand for the Botanical explora-tion of the Provinces of Assam and Burma and each of the local Governments concerned also granted an additional sum of rupees five hundred. There were thus two thousand rupees especially granted for this purpose. As the sum is not a large one and both provinces are rather expensive in the matter of labour and carriage it has not been possible to a very much. In order to arrange a scheme of working by native collectors in the Province of Assam, I visited Shillong in September and I found the late lamented Chief Commissioner Mr Quinton and Mr G. Mann, Conservator of Forests both for the most ... Mr Mann engaged for me two native collectors who had been for some years in his employ

these men were employed near Shillong and in the Khasia Hills. Mr Mann himself by means of a native collector attached to his camp sent down a considerable number of specimens to the Herbarium. A Eurasian collector named Razer was employed for a time in Cachar and on the Lushai country but the recent disturbances amongst the tribes prevented much being done in this direction. Lieutenant Colombe of the Intelligence Department having to make a tour at the base of the East ern Himalayan, a native collector was by the kind permission of Col Woodthorpe C. B. the head of the Department allowed to accompany him, and some interesting specimens were obtained in that region. I also visited the Andaman Islands in order to arrange for a more systematic botanical exploration and through the kind assistance of Colonel Caddell V. C. I was able to initiate a scheme which so far as worked well. Dr Prain, Curator of the Herbarium also visited the Andamans - not so much with the object of explaining as of visiting some of the neighbouring islands. By the kind permission of Colonel

R. N. Commander of Her
Majesties surveying ship "Investigata" &c
has opportunities given to him of
visiting the real Coca islands, the little
Coca islands and Rutland islands. The
&4rab Coca had been visited in a
Prain. But with
that exception no botanist had ever pre-
viously set foot in it and the little
Coca and Rutland islands had never been
visited at all. The botanical results of
these visits will in due time be published
In Upper Burmah some fairly good work
was done by a Mussalman Collector sent
out from the Botanic Garden. The spe-
mens sent by this man are now being
arranged in the Herbarium. Arrange-
have been made for the continuance
during the current year of the collecting
agencies in Upper Burmah the Andamans
and Assam.

Director, Botanical

In February m< -ft Roudlock, Curator of the Royal Botanic Garden, was sent to collect specimens in Tenasserim, Tavoy, and Mergui; he has brought back a very interesting collection from this region.

Colonel Cadell V.C., Chief Commissioner of the Andamans invited me to visit Port Blair in March 1891 and jf/ i /// in connection with the Botanical Survey of [illegible] H. King having granted me permission to pay this visit. Cadell placed a steamer at my disposal and I was enabled to visit and collect in [illegible]dan, Baneri island, Little Andaman, Battu Allabs. Car Nicobar, places, with the exception of the island last named never before botanically investigated. During the whole year Mr E. H. Man has again kindly supervised the [illegible] a collection of Andamans specimen / / by Burmese collectors at Port Blair. After the disastrous cyclone of November 1891, a native collector was sent down in order to obtain specimens from some of [illegible] trees of which the tops, 1 f site* £**- •7/ such unusual circumstances are quite inaccessible. [illegible] was engag[illegible] J * - J y [illegible] sporming

Report of Botanical exploration in the provinces of Assam and Burma for the year 1891-92.

During the year the Government of India granted the sum of Rs 1000/- for Botanical exploration in Burma and Assam, while the local Governments of these two provinces contributed Rs 500/-.

The total sum of Rs 2,00- has been fully utilized and the money has been spent in equal sums of Rs 1000/- in each province.

In Burma a garden collector was at work for the greater part of the year in the Shan Hills and for the last two and a half months in the Ruby Mine district. This man has sent large collections from both districts. Under an arrangement kindly made by Dr Leslie, late Secretary to the Inspector General of Jails, Rangoon, some specimens were also received from frontier stations. A small collection of Burmese

Vide Fuller

collectors were at work during the whole year throughout 1891. They were stationed in the Naga Hills where they were looked after by Mr Davis, Deputy Commissioner who kindly gave facilities for their residence at police outposts and in other places suitable for botanical work. Early in 1892 they were transferred to the Lushai Frontier at the wish of Mr McCabe who had kindly volunteered to take them into the Lushai hills and personally supervise their work. Subsequent events in this region have prevented Mr McCabe from carrying out his proposal at present and the men are therefore being transferred to the Jaintea Hills where at Jowai Mr S. E. Peta, Assistant Commissioner, has kindly undertaken to look after them. Collections of Assam plants have been made by Mr Peal, near Sibsagar, and Mr Heawood near Dhubri while Mr Bamber, Analyst to the Indian Tea Association who [illegible] in Assam has kindly undertaken the [illegible] mation of a collection. In [illegible] directed to make a botan[illegible] in the Khasia and [illegible] hills and was [illegible]

this duty at the close of the financial
year.

Yours D. Brain
Acting Director &c.

Report of the Director of the Botanical Survey of India for the year 1892-93.

When for the &**,%.£**£+ £f Botanical Survey, India was divided into four parts, the share allotted to the Superintendent of the Botanic Garden Calcutta was defined as comprehending all the provinces under the Government of Bengal together with the provinces of Assam and Burma and the Andaman and Nicobar Islands. And was thus entitled the Bengal Province: the other three parts of the Empire were respectively allotted to the Directors of the Botanical Surveys of Northern India, of Madras and Bombay; and by a recent order of the Government of tA«<r*<ia &e Directors of ate C&Me three surveys have been requested to transmit their reports to Submission fo &jt "Wfirri . . . ,y..- of India with my own. I shall in the t\s^tt<7 connection first deal with the &X&iJl'&&it^ in the Section iff country allotted to me as Superintendent of the Calcutta Botanic Garden.

As in the A'l£t/4+-t* year the Government of India made a grant for

the exploration of Provinces of Assam and Burma of the sum of Rs 1000 - - which was supplemented by a further grant of Rs 500 from each of the local administrations concerned. The money at my disposal for the exploration of the Assam and Burma was thus Rs 2000. The cultivated parts of the [illegible] Bengal require little or no exploration, as their vegetation is well known. But along the frontiers of the province (especially on the North) there is much country of the vegetation of which full collections still remain to be made. Expenditure on this area is met from the grant of the Botanic Garden Calcutta. For the exploration of the Andaman and Nicobar Islands no provision is made either by the Government of India or by the Chief Commissioner of these settlements the cost also falling to be met from the funds of the Botanic Garden, Calcutta.

Assam. - At the opening of the financial year Dr Prain, Curator of the Herbarium was engaged in making a botanical tour in the [illegible] between Shillong and Cherapunji. Although his tour was necessarily a short one Dr Prain made considerable collections and obtained specimens of a number of species which had not been reported

the earlier collectors these hills. While at Shillong Dr Prain arranged (as mentioned in last report) with Mr Rita Assistant Commissioner of Jowai to have the two native collectors who had been previously at work in Cachar transferred to the Jaintia Hills under that officer's supervision. During the year Mr Rita very kindly superintended the work of these men and the result was that specimens of a considerable number of plants of interest from Jowai and the nearer parts of the Jaintia Hills were collected and transmitted to the Calcutta Herbarium.

Burma — In Burma a native collector worked during the first half of the year in the Jowai country at the base of the Shan Hills. After the rains he went to the higher country beyond but he returned sick about the middle of the season bringing with him however a small collection of dried plants. On his return another man was sent from the garden to take his place and this man has since remained at work in the Shan States. Both these collectors have sent fairly large collections of specimens but as is invariably

invariably the case in collections made by natives working without supervision, they contain much too large a proportion of specimens of such common plants as grow near cultivation and are therefore easily obtainable. Skilled European supervision is of course impossible with the slender resources at my disposal: and unskilled European supervision, in the form of help from Civil or forest officers, is unfortunately not always to be counted upon.

Andaman Islands.— The arrangement of previous years, namely of collecting by means of two Burmese was continued during last year. Owing to the unremitting exertions of Mr. E. H. Man C.I.E., Deputy Commissioner [illegible] Andamans, who is kind enough to undertake complete supervision of these men, the arrangement continues to be a great success, and an excellent suite of specimens of the extensive Flora of Andaman Islands is thus gradually being brought together.

Bengal.— While on deputation in the Rajshahye district on an enquiry into the cultivation and storage of Ganja, Dr. Prain made a collection of the plants in the neighbourhood of Naogaon. Owing to my absence

impossible for [illegible] Prain to make any collecting tour. The Government of Bengal however provided funds for the deputation for four months of Mr G. A. Gammie, an Assistant on the Cinchona plantation, to the frontier of Sikkim and Tibet. Mr Gammie brought back a most interesting collection of plants and seeds. His first excursion extended through the Singalelah Range to its origin in Kinchinjunga. In the vicinity of Kinchinjunga itself Mr Gammie was, on account of the great inclemency of the weather, able to remain only a few days. He next travelled across Sikkim to Tumlong, from whence he followed up the Teesta to Chungtam. From thence Mr Gammie explored the Lachung Valley as far as the Donkia La, which was the northern limit of his travels. He spent two months in forming collections in this valley, and then ascended to Thanka La, and also to Ghora La at the head of the Sebu valley, one of the few tracts in this region which Sir Joseph Hooker was unable to visit during his sojourn in the Eastern Himalayas in 1849-50. From Lachung Mr Gammie returned

returned to Sumleong, and from thence he crossed the Chola range visiting the Chola, Yak-la and Zey-lap-la passes. He returned to the Cinchona Plantation by the Military road from Gnatong to the Tista bridge.

Madras - Dr M Lawson, Director of the Madras Survey has submitted no report as he found it impossible on account of his other duties to do anything during the year to advance the Botanical Survey of the Madras Presidency. A copy of his letter explaining the matter is appended.

Survey of Northern India - The Director Mr J. F. Duthie has submitted a report of his operations for the year which together with its five appendices I transmit in original herewith. Mr Duthie's report contains details of distribution of plants of fine varieties of Date Palms imported from the Persian Gulf, of seed of Egyptian Cotton and of indigenous grasses; and of other useful work of economic value and interest. In connection with the Botanical Survey he records the details of his tours in Kashmir A i-^Sf Gilgit and gives an account of the specimens received and distributed by the Saharanpur Herbarium. Notable amongst the former is a fine collection

collection from the Caucasus Siberia and Altai mountains contributed by Mr Batalin, Director of the Imperial Garden and Herbarium St. Petersburg: and also what cannot fail to be a most interesting collection made in the Pamirs by that intrepid explorer Captain F G Young husband. Mr Duthie's tours in the less known parts of the North Western Himalayan have already been productive of splendid collections of dried plants in the distribution of which the Calcutta Herbarium has benefitted to a very notable extent. Mr Duthie visited as usual the Calcutta Herbarium for a fortnight towards the end of the year when further advantage was taken of his great knowledge of the difficult family of grasses to have many of the unnamed Calcutta specimens identified by him. During this visit I had also the advantage of being able to discuss with him the affairs of the Survey.

Bombay.— Dr T. Cooke, C.I.E., Principal of the College of Science Poona has submitted a most interesting report on the work of the Survey of the Bombay Presidency which I herewith transmit in original. Dr Cooke has been in charge of the Survey since it was

inst. [illegible]

instituted in 1890 and with very slender resources, and with no personal remuneration he has done a wonderful amount of work. The details of Dr Cooke's work during the year under review are given in his report to the fifth and sixth paras. of which I would invite your attention as they give an account of the establishment at his disposal. The thirteenth paragraph details the authentically named Herbarium specimens which have been issued during the year. These amount to no fewer than 1533. Nobody who is not familiar with Herbarium work can quite appreciate what an amount of labour this really represents. Specimens issued in this way bear a certain amount of authority and it is absolutely necessary that each shall be identified and named with as great an approach to accuracy as possible. In the eighth and ninth paragraphs of his report Dr Cooke indicates the parts of the province in which collections at certain seasons of the year still require to be made. Dr Cooke has received very energetic help from his assistant Mr Woodrow, who is now during Dr Cooke's absence in Europe on furlough conducting the duties of

Forest. Dr Cooke acknowledges the great encouragement which he has received from the Hon'ble Mr Birdwood and the willing help which is given to him in the prosecution of the work of the survey by Mr W. A. Talbot of the Forest Department and by Dr Lisboa.

Towards the end of the year Dr Cook visited Calcutta and I had the advantage of conferring with him personally on the affairs of the Bombay survey. And amongst other matters I discussed with him the propriety of his undertaking the preparation of a Flora of Bombay. By Dr Cookes efforts in the way of making collections during the previous three years there have now been brought together a sufficiency of Herbarium material to warrant the immediate commencement of the undertaking. The only deficiencies in the material are those referred to in paras 8 and 9 of Dr Cookes report and they are now being made good by Mr Woodrow. The preparation of the systematic account of the plants of any considerable province (commonly called a Flora) is a work which can be carried out with accuracy and only

in a large and well equipped Herbarium attached to which there is also a complete botanical Library. The Flora of Bombay is now known (according to Dr. Cooke's estimate) to include about 2,000 species of flowering plants. The last published systematic account of the Bombay Flora is Dalzells. It contains descriptions of only about 1,600 of these and it appeared so long ago as 1861. Dalzells Flora contains no descriptions of the genera which is a great inconvenience << the book cannot be used by anybody who does not possess some other book giving an account of the Genera. It is true that the plants of the Bombay Presidency are all described in Sir Joseph Hookers Flora of British India of which the sixth and concluding volume is now in preparation. But they are described along with about twelve thousand other specimens from parts of the Empire so remote from Bombay as Tavoy Burma and the Khasia Hills. A special Flora of the Bombay Province would therefore be of the greatest use. And I understand from Dr. Cooke that there are many natives of that Presidency who desire to make themselves

acquainted

TOf^j ...aunted with ... of their own
f ...bourhood is quenched simply from
... want iff- sufficiently manageable ex
f * ... It seems a pity that such a
laudable desire should not be ex...
J\A4*-fA ...than ...ched. ...ration of
a ... co. ... wo...
... ...ken ... art
i ... the Bombay Presidency not itos*n
... Poonah is there a large enough
Herbarium nor a sufficiently well equipped
botanical library. The work should be
done at Kew where there are preserved
the type specimens which have been
consulted by Sir Joseph Hooker and
his collaborateurs in preparing the Flora
of British India. The present appears
to me to be a most opportune time
for beginning this work. Dr Cooke, who
is /i* 4 months 7 the man to undertake
it, is now in Engla***& on furlough
J k f ' Of-4 * that he took with him a
la*<*£. collection jjT Bombay plants to
work at during his furlough. He is
t, of Enthusiasm and has at At. esent
immense a tt«< ...nt of field knowledge
of species a kind of knowledge which
I know from experience to be ... r
very

very evanescent sort. I am therefore of opinion that negotiations should be at once entered into with Dr. Cooke for the preparation at Kew, and under the authority of the Director of that establishment a complete Flora of Bombay. The work might be begun during Dr. Cooke's present furlough, a proper allowance being made to him for the expenses of working at Kew. Although, as I have just said, the Flora should be prepared at Kew it need not be printed there. It could be put in type more cheaply and quite as well at some of the Government Presses in this country.

It would be inappropriate for me to suggest the details of the arrangements which it would be necessary to make with Dr. Cooke as to remuneration, the amount of time required for the preparation of the proposed Flora or to suggest the source from which the funds might be provided. All that I desire to do is to record my very decided opinion that an opportunity now offers for the preparation

of a Flora of the Bombay Presidency which may not occur for many years and that the preparation of such a Flora would form a very worthy initiation to the published work of the Botanical Survey of India.

I have &c,
Sd/ G. King
Supdt &c,

REPOKT OF THE DIRECTOR OF THE BOTANICAL SURVEY OP INDIA, FOR THE TEAR 1893-94.

As explained in my report for last year, the part of India which, for the purposes of Botanical investigation, has been allotted to the 'Superintendent of the Botanic Garden of Calcutta, embraces the provinces under the Government of Bengal, together with those under the administration of the Chief Commissioners of Assam, Burma, and of the Andaman and Nicobar Islands. As there is only one other Botanical Officer besides myself attached to the Calcutta Garden, it was not possible to conduct, during the year, any botanical exploration under direct European supervision; the whole time and attention of Dr. Prain, Curator of the Herbarium, having been occupied for fully four months in an enquiry into the cultivation, therapeutics and chemistry of the drugs derived from *Cannabis i'ndica.* For these months Dr. Prain was actually on special deputation in connection with this enquiry, and for a large part of that time he was absent from the Botanic Garden. The results of Dr. Prain's labours were embodied in a full and exhaustive report on the whole subject of these drugs, and this report was submitted to the Hemp Drugs Commission. When the Report of that Commission shall itself be issued, Dr. Prain's researches will no doubt be made public. In the meantime his account of them has been treated as a confidential paper, of which I am unable to submit a copy herewith.

2. Although the main result of the working of the part of the survey under, my direct control was, during the past year, economic, the collection of botanical specimens was by no means neglected. Native Collectors were employed in Assam and in the Shan Hills (in Burma), and by these men considerable numbers of specimens were obtained. Many excellent specimens were also prepared by two convicts, who, by the kind permission of the Chief Commissioner of the Andamans, worked as botanical collectors under the supervision of Mr. E. H. Man, C.I.E., Deputy Commissioner. To.Mr. Man my warmest acknowledgments are due for the active and sympathetic interest he has taken in training and guiding these convicts in the (to them) quite unfamiliar work of making botanical collections. Thp pay and incidental expenses of the collectors in the provinces above mentioned absorbed the whole of the grant of R2,000 which was made to me for their exploration during the year. The specimens of plants thus obtained were partly named and distributed to various botanical institutions, and the remainder will be similarly dealt Ttith as occasion offers. One of the functions of the Herbarium of the Botanic Garden, Calcutta, is to act as a sort of clearing-house where botanical specimens are received, named and distributed. During the year there were issued to Indian Botanical institutions from that Herbarium the following carefully named specimens :—to the Director of the Botanical Survey of Bombay, 617 specimens ; to the Director of the Survey of Northern Jndia, 292; to the Madras Herbarium, 60; to Mr. J. Sykes Gamble, Director of the Forest School, Dehra Dun, 591 specimens. In return for these, Mr. Duthie, Director of the Botanical Survey of Northern India, contributed 1,427 specimens, Mr. Gamble 164, and Mr. Woodrow, Acting Director of the Bombay Survey, 6 specimens.

3. *Survey of Northern India.*—Mr. J. P. Duthie, Director of the Survey of Northern India, has submitted a report on his work for the year. He has also submitted an account of a botanical tour made in Kashmir in 1893, together with notes on some of the plants of economic interest met with in Kashmir, Baltistan and Gil git, and also a separate note on the fodder-yielding plants of the latter district." These four papers I transmit herewith in original, and I would suggest that the latter three should be published as the third number of the Records of the Botanical Survey of India. Mr. Duthie explains that the map which is intended to illustrate his tours in Kashmir during 1892 and 1893 has already been sent direct to you. Mr. Duthie's report gives details of much economic work, prominent amongst which is the distribution of seeds of useful plants, and of seeds of Kashmir plants of horticultural. me&t. His report also

contains part
and of the disposal to other museums in Northern India of the miscellaneous
£ Thu .d?n*r tL W^h had fM »»* years WnaccumXrJgTn the
Saharanpur garden. Mr. Duthie accompanied the
students of the Imperial Forest School in a tour in the forests of Jaunsár during the month of May; and, from the 15th June to the 15th October, his time was occupied by the botanical tour in Kashmir already referred to. Part of Mr D
p
F
garden du visit to the Herbarium of the Calcutta
doubtful season; and, as usual, gave help in the determination of

4. *Bombay.*—The rcpm-tut uuujjombay Survey,xogetfier M^ViJi^ appendix (herewith submitted in original), is by Mr. G. Marshall Woodrow, who succt*wk>a Dr. T. Cooke, C.I.E., as Director of the Bombay Survey on the retirement of the latter from the Indian Service about a year ago. Mr. Woodrow gives a brief account of the work of his Department for the year and, as an appendix to his report, he submits an interesting account of a botanical journey from Haveri to Kumta, of which I recommend the publication as one of the Records of the Botanical Survey of India.

5. *Madras.*—Mr- M. A/Lawson, Government Botanist and Director of the Government Cinchona Plantations on the Nilgiris, submits the report of the Madras Botanical Survey for-the year; and I transmit it to you herewith in original. Mr. Lawson's report consists chiefly of an account of a botanical tour made by him from Ootacamund, through Travancore to Cape Comorin, and thence through part of the Tinnevelly District back to the Nilgiris. This tour took Mr. Lawson through some country which, from a botanical point of view, is about the richest and the least explored in Southern India. Mr. Lawson's object in making this tour was, as he himself explains, rather to arrange for future collecting operations than to collect himself. The notes made by Mr. Lawson ought to be of much use to future explorers; and, with the view of putting them on record in an accessible form, I would suggest their publication in the Records of the Survey of India.

6. In thp 3rd, 4th and 5th paragraphs of this report I have recommended the publication of three papers as part oil the Records of the Survey, The first of these (Mr. Duthie's) is, with its two accompanying sets of ecomomic notes, sufficiently long to occupy an entire number of these Records. I would, therefore, suggest its publication as the *third* number of the series. Mr. Woodrow's and Mt. Lawson's papers are much briefer than Mr. Duthie's; and, as they both refer to regions in Southern India, I would suggest thefr publication in a sicgle number of the Records, namely, as number *four* of the series.

G. KING, *M.B.*,

Brigade-Surgeon-Lieutenant-Colonel,
Director of the Botanical Survey of India.

Annual Report of the Botanical Department, Northern India, for the Year 1893-94.

Personal.—The following is a brief sketch "of my movements during the past year. I was at Head-quarters from the 1st to the 5th of April, and on the 6th I left for Aligarh, where I met Dr. Leather, Agricultural Chemist to the Government 6f India. I accompanied him on his visit to the Dairy Farm in the Chherat usar reserve, and explained to him the nature of the experiments which have been undertaken there towards the reclamation of the usar waste land, I returned on the 8th to Saharanpur, and remained there till the 25th.

On the 26th I left for Jaunsár *viâ* Mussoorie and Chakráta, and joined the Forest School Camp at Konain on the 2nd of May. I accompanied the students during their tour through the forests of Jaunsár, and for a short distance beyond the Tons Valley, in the leased forests of the Tihri Staté. The School examinations were held at Deoban on the 29th and 30th, and on the 31st I left for Saharanpur, arriving there on the 9th of June.

On the following day I left Saharanpur "for Kashmir, and reported my arrival to the Resident at Gulmarg on the 18th. (My tour in Kashmir is the subject of a special report.)

I returned to Saharanpur on the 15th of October, and left again on the 16th for Simla. Curing my stay at Simla I visited the Annaildale Garden, the Mahásu Fruit Orchards, and a plantation of sweet chestnut trees near T&rdi Devi-belonging to Mr. H. Goad.

I left Simla on the 24th for SSstharanpur, where I remained till the 18th of January.

I went to Aligarh on the 19th and spent three days there in the preparation of maps of the experimental plots in the usar reserves at Chherat and Gursikran. (Copies of these maps accompany my annual report on th« usar reserves,) For the rest of this month, and up till the 18th of February, I waa at Head-quarters.

I left Saharanpur on the 19th for Calcutta, halting at Lucknow for one day to visit the Horticultural Garden. On my return journey from Calcutta I inspected the Khushru B£gh and Alfred Park at Allahabad, and the T&j Garden at Agra, and arrived at Head-quarters on the 3rd of March,

I left Saharanpur on the 18th for Dehra, and remained there until the end of the month to assist, at the final examinations at the Forest School.

DISTRIBUTION.

Museum specimens.—More space being required for the Herbarium collections, to which lar^e additions are made every year, the permission of Government was obtained for the transfer of some of the museum specimens to other institutions where they would prove to be more specially useful for instructional purposes than at Sabaranpur. In this way I was able to supply for the Agricultural School at Cawnpore a complete set of coloured clay models of Indian vegetables and fruits, together with two glass cabinets. These models were prepared at Saharanpur at the time of the Calcutta International Exhibition.

Another set of these models and two glass cabinets have been sent to the museum of the Thomason Engineering College at Roorkee.

To the Imperial Forest School at Dehra the following articles have been contributed:—

(1) A lar<?e collection of Indian fibres prepared at Saharanpur. The original set, of which this is a duplicate, obtained a gold medal at the°CaIcutta International Exhibition.

(2) A large number of specimens of vegetable oils.

(3) Two glass cases to contain the above.

The museum at Saharanpur was originally started by Dr. Jameson in 1859, in which year the present building was erected. Up to that time no special building existed in which to arrange and exhibit the numerous specimens collected by Dr. Jameson and his predecessors, Dr. Royle and Dr. Falconer. In 1876, when I took over charge from Dr. Jameson, the museum at Saharanpur represented a very fair example of an old-fashioned provincial museum in England. Although containing many specimens which were individually valuable, such as Dr. Falconer's type specimens of Siwalik fossils, the collections on the whole were much too miscellaneous in character. The establishment of the fine museum at Lucknow offered a good opportunity for the disposal of the more valuable specimens not required for exhibition at a Botanical institution. The contributions to that museum included the valuable specimens of Siwalik fossils collected by Falconer and Jameson; also a large number of minerals, birds, and birds' eggs, etc. The collection and preparation of specimens for the numerous International Exhibitions, which have been held in different parts of the world during the past sixteen years, has been the means of adding very largely to the Saharanpur collections of vegetable products. It is from these more-recently added collections that the above mentioned contributions to Cawnpore, Roorkee, and Dehra have been selected. As there is no particular object for maintaining a museum at Saharanpur for purposes of instruction, I propose, subject to the approval of the Government of India, to limit the collections still further, and to retain only such as are likely to be useful for botanical reference and identification.

Samples if Indian-grown barley for the Imperial Institute, London.— Having been requested fey the Reporter on Economic Products of India to obtain for tlie Imperial Institute a collection of various kinds of barley grown in North-Western India, I succeeded in getting together a collection coiltaining 41 samples, *viz.*, 10 from the Punjab districts, 9 from the North-Western Provinces, and 22 from various States under the Rajputdna Agency. Those from the Punjab were obtained through the Director of Land Records and Agriculture ; of the North-Western Provinces samples, 8 were kindly supplied by the Superintendent of the Saharanpur Garden, and one came from Cawnpore ; for the Rajputana specimens "I am indebted to the Agent to the Governor-GeneraL

***Lucerne seed {Medicogo sativa).*—Twenty maunds were supplied to** Captain Yielding, D. S, O., Assistant Commissary General, on special duty in Kashmir.

Bobinia pseud-acacia seed.—Ten pounds were sent to" Captain Yielding, D. S. O., for trial in the Gilgit District, and seven and-a-half pounds to the Deputy Conservator of Forests at Chakrata. The seed was obtained from the Royal Horticultural Society of Tuscany, Florence. This tree promises to be of much value for planting on barren hill sides, and for embankments.

Australian Salt Bush.—A few packets of different kinds received from Baron Von Mueller, the Government Botanist for Victoria, were despatched to Captain Yielding for trial in the Gilgit district, where it is more likely to succeed than anywhere in India.

Fodder Grass seed.—Eleven pounds of *dub* grass seed were supplied to the Secretary of the Grass Committee, Mian Mir, and seventy-two pounds of the **seed of *palwdn (Jndropogon annulatus and A. pertustis)* were sent to the** Forest Department at Lahore for sowing at Changa Manga.

Melon and Grape seed.—Some seed of the Sarda melon, and of another kind grown at Lucknow and supplied by Mr. Ridley; also seeds of the large* white Afghan grape, as well as cuttings of that vine procured from Kashmir, were sen t to Mr. J. Inglis, Sydney, N. S, Wales.

Seeds of Indian pulse.—A collection of the ordinary kinds grown in India, such as *lobia, mung, urd,* etc., was sent to Mr. J. C. Neal, Director of the Agricultural Experiments Station, Stiliwater, Oklahoma, U. S. A.

***Indian Field-pea (Pisum arvense).—A* small quantity of seed was sent to** Dr. Voelcker,, Consulting Chemist to the Royal Agricultural Society of England, at his request.

Iris bulbs.—Specimens collected in Kashmir were sent to Dr. Michael Foster, Secretary to the Royal Society, who has made a special study of this genus.

Himalayan shrubs.—Seeds of various kinds were sent to Dr. F. Franceschi, Los Angelos, California,

Seeds of Kashmir Plants.—These were obtained during my tour in that .country last year, and were distributed to the following places :—

The Royal Gardens, Kew.
The Royal Botanic Garden, Edinburgh.
" " " Glasgow.
" " " Florence.
" " " Berlin.
Tho Imperial Garden, St. Petersburg!*.
The Botanic Garden, Cambridge.
The Natural History Museum, Paris.
The Royal Horticultural Society of Tuscany, Florence.
'lhe Alpine Acclimatization Garden, Geneva.
G. Wilson, Esq.^F.R.S., Weybridge Heath, England.

Merbarium Speoimens were distributed as follows :—

(1; Royal Gardens, Kew . . * .) Kashmir and Baltietan plants
(2) Royal Botanic Garden, Calcutta . .) collected iii^l892.

(3) Sir Joseph D. Hooker, K.C.S.T., etc. . s (. Specimens of passes collected
J in Kashmir and Baltistan in
(4) Professor E. Hackel, St. Polten, Austria . (1892-93,

/K\ n n m i Ei *T?* TJ O " f Specimens of Cyperace® collected
(5) C. B. Clarke, Esq , F.R.S. . . . j in Kashmir in 1893.

(Kashmir and Baltistan ferns
(6) C. W. Hope, Esq. . . . . .j collected in 1893.

(7). Dr. V. F. Brotherus, Helsingfors, Finland . A large number of mosses collected in Kashmir, Baltistan, and in various parts of India.

(8) Royal Botanic Garden, Florence . • J
(9) Imperial Garden, St. Petersburgh • • |
(10) University Botanic Garden, Vienna • • | Specimens from North-West and
(11) Dr. E. Levier, Florence • • • • | Central India.
(12) Mons. S Sommier, Florence • • • |
(13) Richter Lajos, Budapest • • • |
(14) Messrs. Parke, Davis & Co., Detroit, U.S.A. J

(15) Department of Agriculture, Sydney, N. S. Wales. . Collections of Indian grasses.
(16j College of Science, Poona • • • f
(17) Dr. Lisboa, Bombay • • • • ^
(IS) Vety. Cap Lain C. Rutherford . • -I. Mounted specimens of Indian
(19) Major Macausland, I.C.S., Secretary, Grass Committee, Peshawar. •) fodder grasses.

(20) H. Groves, Esq., F.L.S., London . • C Specimens of Potamogeton from North-West and Central India.

(21) Dr. G. Watt, C.T.E. . . • • • C Specimens of various kinds of Indian cotton.

He additions made to the herbarium collections during contributions should be mentioned :—

From the Herbarium of the Royal Botanic Garden, Seebpore, Calcutta:, about 300 sh ets
, Prom the'col'lege of Science, Poona: 668 sheets of Bombay and Siud specimens.

From J. Sykes"Gamble, Esq , Conservator of Forests, School Circle: a collection of Indian species o£ bamboo; also several interesting plants collected last year on his tour to the Upper Tons Valley, iu Tihri, Garhwal.

From the Assistant Conservator of Forests, Quetta: a large collection o£ Beluchistan plants.

From Messrs. Parke, Davis, &. Co., Detroit, U. S. A.: 108 specimens of North American plants.

In addition to the above, complete "sets of the plants collected during my tours in Jaunsar, Kashmir and Baltistan in 1892 and 1893 have been mounted and arranged. These collections are represented by about 3,000 sheets, not including the mosses, of which several hundred kinds were collected.

With a view to preparing a list of the plants known to inhabit Kashmir and Western Tibet, the collections from these countries have been removed from the general herbarium, and are now separately arranged according to their natural orders.

Surgeon-Captain Lane, attached to the 23rd Pioneers at Chilas, has very kindly undertaken to send me specimens from that little-explored portion of the Indus Valley. Captain Younghushand, C.I.13,, has also promised contributions from Chitral, the flora of which region is equally unknown.

A separate herbarium of economic plants is in process of formation. This I propose to arrange alphabetically, so as to corresp(Tnd with, and, to some extent, illustrate the Dictionary of Economic Products of India. This collection will be specially useful for reference in connection with Agricultural botany.

PUBLICATIONS.

The third and concluding patft of the "Pield and Garden Crops of the North-Western Provinces and Oudh" has been submitted to the Government of the North-Western Provinces. A few "copies, intended for presentation, are now being coloured by my draughtsman at Saharanpur.

A list of the plants occurring in the neighbourhood of Gulmarg, in Kashmir, has been seat to Mr. *W.* JJ. Lawrence/C.S., C.I.E., Settlement Officer in Kashmir, for inclusion in his final report.

ESTABLISHMENT.

My draughtsman, H. Hormusji Deboo, has had his time fully occupied during the past year in making drawings of undescribed plants collected during my recent tours, and in preparing maps of the experimental plots in the usar reserves. He has also got ready some new botanical diagrams for lecture use; and for the Agricultural Department of the North-Western Provinces he has made some excellent drawings of the Persian wheel.

***Botanical Collectors.*—Inayat Khan, who accompanied me on my journey to Gilgit in 1892, was with me also last year in Kashmir, and did excellent work. Harsukh, another collector, has been sent to the Kurram Valley, partly to assist, under the superintendence of the Executive Engineer, Mr. Davis, in arboricultural operations, and also to collect specimens for the Saharanpur Herbarium.**

My Head Clerk, Lala Umrao Singh, "and his Assistant, N. Hutchinson, have been working satisfactorily during the year, and I have no fault to find with them.

SAHARANFTJB,
The 33rd June 1894.)

J. F. DUTHIE,
Dnector, Botanical Department,
Northern India,

APPENDIX.

*Financial Statement of the Botanical Department, Northern India, during the year 1893*94.*

BOTANICAL DEPABTMENT.	IJXPBNDI'rUBE.						BBOBIPT.		
	Director's salary.	Head-quarters establishment. *	Camp establishment.	Travelling allow-ances.	Contingencies.	Total.	Fodder Grass Books.	Fodder Grass Albums.	Total.
	R a. p.	R a. p.	R a. p.	& a. p.	R a. p.	R a. p.	R a. p.	8 a. p.	# a. p.
Budget Grant for 1893-94	10,200 0 0.	2,710 0 0	1,090 0 0	2,600 0 0	2,330 0 0	18,930 0 0			
Expenditure during 1893-94	10,200 0 0	2,706 10 5	1,064 6 7	2,349 • 9 0	2,268 3 1	18,588 13 1			
Balance		3 5 7	25 9 5	250 7 0	61 12 11	341 2 11			
Realjzed by sales during 1893-94 .						mill	51 1. 0	.25 0 0	76 1 0

SAHARASJPUR,

The 23rd June 1894.

Dated College of Science, Poona, tlie 8th July 1894.

From—**G, MARSHALL WOODKOW, Esq.,** ***In charge Botanical Survey, Bombay Pretidency.***

To—**DR. G. KING, C.I.E.,** ***Director, Botanical Survey of India.***

I have the honour to submit the following report on the work of the Botanical Survey of Bombay Presidency during 1893-94.

2. The investigation of the flora has been continued by journeys of botanical collectors in Kanara, Concan, Dharwad, Guzerat and Sindh, and a list showing the additional plants collected or identified during the year is appended. Although there are still many plants known to exist in this country, that are not represented in the collection, it must be admitted that the work of the last year has reduced the number considerably and the extent of the existing collection renders the acquisition of numerous additions difficult and needing a higher degree of botanical training than obtains among the collectors hitherto employed.

3. At the beginning of the year the collecting establishment consisted of three men, one on R30, one on B25, and one on R20 per month ; the two higher graded were sent to Sindh, and, having returned from various reasons, refused to join their work in that province ; in consequence their services have been dispensed with and the work carried on by the remaining collector, by Mr. Ranade, the Herbarium-keeper, and myself with the assistance of the gentleman whose services are specially acknowledged below.

4. I am of opinion that, in the present stage of the work, it will be more conducive to advancement to encourage men having some special knowledge of the work, than to fill both of those places at present.

B. When the collectors in Sindh failed in their work, an appeal was made to Mr. H. E. M. James, Commissioner in Sindh, which has been responded to cheerfully. That gentleman has sent a considerable collection made by himself in the Khirtar mountains, including plants which, as far as the means of information available here permit me to judge, are undescribed and are being submitted to you. Mr. H. E. M. James has also interested some of his officers in the work, from which good results may be expected.

6. Although an herbarium had not previously been maintained in this province, the Phanerogams had not been neglected, as the records in the Flora of British India show ; but the lower Cryptogams, especially such, as are the diseases among our crops, have received comparatively little attention. I regret the present staff of this survey being engaged in college work has but little time available for this important work.

7. Important contributions to the Herbarium have been received from—

Dr. G. King	Calcutta,
Mr, Talbot	Dharwad,
W Duthie	Saharanpur,
„ H. E. M. James	Karachi,
Dr. Lisboa	Bombay,
a Dalgado	Sawatwadi,
Mr. Abdulkadar Umarkhan	Karachi,

and exchange communications have been despatched to the same addresses.

8! An account of the plants met with in my recent walk from Haveri, across Kanara, to Kumtha, is appended.

Note supplementary to the Beport of the Director of the Botanical Survey of India, dated 30th August 1894.

At the request of the Government of India as contained in the marginally noted letter, Mr. Lawson's report will appear in the Botanical Survey Records.

T^-I daled Simla, the 18th August 1894.

G. KING, *M.B.*,

Brigade-Surgeon-Lieutenant-Colonel,

Director of the Botanical Survey of India.

GovernmeDt of India Central Printing Office.-No.391 R. & A. D.-26-10-94.-3O0-W. B. G.

REPORT OF THE DIRECTOR OF THE BOTANICAL SURVEY OF INDIA FOR THE TEAR 1894-95.

According to the arrangement made when the Botanical Survey was first established, the parts of India allotted to the Superintendent of the Botanic Garden, Calcutta, for exploration are the provinces of Bengal, Assam, Burma, and the Andaman Islands. During the year 1894-95 something was done in the way of exploring each of these provinces. A Native and a Eurasian collector were employed to a small extent in the neighbourhood of the Ruby Owing to working in such a remote part, the results were not, however, very " t ^ w t a j , the collections sent in consisting, as is usual under such circumstances, mostly of common and easily obtained species. In the Andaman " f J ^ J ^ S ^ f better, for the two convicts there employed were ? n " y y X o u K, E H Man C I E Detraty Commissioner of the Settlement, who, altnougn noi L ? e l f M a S o S S c I interested in botanical work and who «Mndjfct* able in his efforts to help. In the province of Assam, a tour was made by Mr. G. A. Gammie, who acted during the year as Curator of the Calcutta Herbarium in place of Dr. Prain, who wasi absent on furlough. M^amniM; tour was made mainly in the district of ^akhimpur. Hehas wrtten an interesting account of it; and, having carefully/entfed^all the P ^ s f ^ collected, he appends a list of them to '*» wport. ^ ^ S ^ % S i ward to you in original with the recommendation that they should be^punted in the Records of the Survey. During his tour in Assam, Mr. Gammie llected 1,434 Herbarium specimens, while the collections from the Andamans made under Mr. Man's supervision amounted to 847 specimens, and those of the Eurasian and Native collector m Burma to 970. J™® 3 r p i Q C * ated buted to the other officers of the Botanical Survey, ^ " ^ ^ ^ S ^ in the Calcutta Herbarium. Collections of dried P ^ j a " «, X t t e were distributed during the year to tj« ' o i l i n g • to the ftiwto o, ^ Botanical Survey of Northern India, «* K ^ G a m b l e , for the Herbarium Botanical Survey of Bombay, 102; to M r -/' X L f l d m s Herbarium, 201. On of the Forest School, Dehra Dun, 128; and to * { »] £ ^ I j S £ ^ from Mr. the other hand, there were received at the Ca^utta g « £ * ^^ ; d 128 spe ur-

ve e report for the year has been submitted by Mr. J. F. Duthie, and » J.« w n « ^ ™ f d ^ e dist g buti on of dried gives the details of most useful work m the way or. t ^ ^^ ag specimens of plants, and of samples got econo mic roducts. ^^ ^ ^ usual lectured on Botany to the students ot n uenr a Dun Forest lso ex lor ed ^ ^^ accompanied them ^»tour through Jaumar tte a whigh attain an ^ range li hUls, which lie, to the north-east ^ e o t a ' s time ^ spent ^ ^ very vation of about 13,000 feet. 1'art« M ^ J J ; e g in the Herbarium at Sahauseful work of naming and arranging Jfc™ a Manga Forest plantations ranpur. He also made pections, o tte ^ n d e r l gen erals pervi8ion. and of the various Government Gardens wnicn pu.^, e leave.

He was absent during the year on th « e m « ^ y . ^ l r , a Marshall

3. Dofairi Ml « « w y H S ^ H n S h e year, submits a report which I Woodrow, who has been in ? Xr « n o r t although brief, contains some very herewith forward in original. The report, a u ^ » { ^ Wegt ^^^ and ako interesting information about the wna date t used largel y native dairymen for about thf ingredients of a F e P a r S . c o w s Mr Voodrow also chronicles increasing the secretion of milk » » ^ * ^ ^ the cultivation of the grass

l t ! S S S 5 K I W & ^ lasely used D the ne ^ bourhood so

of Calcutta, as a raw material for the manufacture of paper. Specimens of economic products to the number of five hundred were sent, during the year, to the Imperial Institute. Accompanied by Mr. Raaade, the Curator of the Poona Herbarium, Mr. Woodrow made a tour on foot from Poona to Nagotra. Of tbis tour Mr. Woodrow has submitted a short account which should, in my opinion, be published in the Records of the Survey.

4*. *Botanical Survey of Madras Presidency.*—Mr. M. A. Lawson was absent on leave during the only part of the year when his services could be spared from the Cinchona Factory at Nedduvattam. He was unable, therefore, to make any botanical tour.

GEORGE KING, M.B.,

Brigade-Surgeon-Lieutenant-Colonel,

Director of Botanical Survey of India,

No. 41, dated Saharanpur, the 10th June 1896.

From-J. F. DUTHIB, Esq., Director, Botanical Department, Northern India,

To-The Director of the Botanical Survey of India.

I have the honour to forward, for submission to the Government of India, Department of Revenue and Agriculture, my Annual Report for the year 1894-95.

Annual Eeport of the Director of the Botanical Department, Northern India, for the Year 1894-95-

Personnel.—On the 1st of April I left Saharanpur for Lahore, and inspected the Agri-Horticultural Garden on the following day. I then proceeded to Chakrata to join the camp of the Dehra Dun Forest School students as Botanical Instructor. I accompanied them on their tour through Jaunsar, and across to Tihri Garhwal as far as Deota.

Having completed the course of lectures on botany, I made a short expedition to the Chansil range of hills, which lies to the north-east of Deota and rises to an elevation of about 13,000 feet. After securing a large collection of interesting specimens I returned to Chakrata and reached Mussoorie on the 16th of June. Here I remained till the 29th, during which time I was occupied in the preparation of my annual reports.

I was at head-quarters until the 5th of July, and on the morning of the 6th left for Lahore. On the 7th I went to see the Government plantations at Changa Manga with Mr. A. V. Munro, Personal Assistant to the Conservator of Forests, Punjab. Prom the 8th I was allowed to take 10 days' casual leave, and on the 17th I returned to head-quarters and remained there till the 8th of August, on which day I left for England on three months' privilege leave. Mr. Gollan, the Superintendent of the Garden, was in charge of my office during my absence.

After my return from leave I remained at head-quarters until the 4th of February. I left on the 5th for Lucknow, and inspected the Government Horticultural Garden, and the various parks, which are under the superintendence of Mr. Ridley; thence to Aligarh to visit the usar reserves. I left Aligarh on the 10th for Calcutta, and stayed at the Royal Botanic Garden till the 15th. On the 16th I went to Allahabad to inspect the gardens there, and thence on to Agra to visit the Taj Garden, returning to Saharanpur on the 20th.

I remained at head-quarters till the 8th of March, and on the following day started for Lahore to visit the Agri-Horticultural Garden, and returned to Saharanpur on the 12th.

I left again on the 16th for Dehra to assist at the final examinations at the Imperial Porest School, and there I remained until the end of the month.

DISTRIBUTION.

Seeds of Indian pulse.—At the request of Dr. J. A. Voelcker, Consulting Chemist to the Royal Agricultural Society of England, samples of the following kinds were sent to him for analysis *x—Lathy rus sativus, Pisum sativum,* and P. *arvense.* The *Lathy rus,* or *kesari* pea, so well-known in this country as liable to act poisonously on men and cattle, if partake* of to excess, baBreoently attracted a good deal of attention in England in causing the death of horses and cattle: and its detection as an adulterant in the preparation of feeding cakes has led to some rather important lawsuits. In a letter recently received

experiments, not only with horses,

but rather with cattle and sheep, and get know to ^ *l* ^ ^ ^ *J* ^ ^ *sativus* does, what the symptoms are, and if all or only some vaiieties are poisonous.^

On t n: a cro 1 ·n certain districts of the Central Provinces is, at any rate, ™ *ISZtc\e* completely^nocuous.Some ^ ^ ^ " 3 and seeds of this latter kind were sent *to* me by JJ. Fuller, Settlements and Agriculture, for botanical ^ification. Excepting its less robust habit and L smaller ^ ^ fe seeds, I was unable to detect any it distinguished from the *kesari* pea as The poisonous kind is also cultivated in the Central forwarded to Dr. Walter Leather, ho has been requested to

ascertain by analysis the chemical properties of each.

Egyptian Cotton seed.—One hundred and sixty pounds of the Hamonli variety have been supplied to the Ulwar Durbar. The arrangements for procuring this consignment were obligingly made by Mr. Walter Draper, an English Gardener temporarily employed in Egypt.

Dhdk seed (Butea frondoza).—Seventy-two pounds of this seed were sent to lligarh for experimental sowings in the usar reserves. The Conservator of Forests, School Circle, was kind enough to have this seed collected for me.

Salt bush.—Seeds of various Australian species of *Atriplex {A. nummularia, halimoides, vesicarium,* and *glancophyllum)* were sent to Captain Yielding, C.I.E., D.S.O., for trial sowings in the Gilgit district. These seeds were received from Baron Von Mueller, Government Botanist, Victoria.

Fodder Grass seeds.—Three hundred pounds were supplied to the Superintendent of Forests, Marwar.

Indian Vegetable seeds.—A collection of these were sent to Professor L. H. Bailey, Agricultural College, Ithaca, New York, at his request.

Indian Timber trees.—Seeds of these were sent to the South Californian Acclimatization Association, Santa Barbara.

Capsicums.—A collection of the seeds of all the available varieties wete sent to the Director of the Missouri Botanical Garden in America.

L&wn Grass seeds.—A consignment of selected kinds suitable for the Himalayan climate were obtained from Messrs. Vilmorin & Co., Paris, for trial sowings at Simla and the neighbourhood-

Seeds of Kurram Valley and North-Western Himalayan plants.—Collections were sent to the Royal Gardens, Kew; the Royal Botanic Garden, Florence; the Royal Horticultural Society of Tuscany; the Royal Botanic Garden, Edinburgh ; the Botanic Garden, Cambridge; the Imperial Garden, St. Petersburgh ; and to the Oriental Museum, Vienna.

*Varieties of Indian rice for cultivation in Australia**—Two hundred and seventy-two pounds, including seven varieties, were sent to Mr. F. de Castelle, Tongala, Victoria, for trial cultivation.

Herbarium specimens—Were distributed as follows :—

The Director, Royal Gardens, Kew.	**One set of Kashmir and North-Western Himalayan Mosses.**
The Director, Royal Botanic Garden, Seebpore.	
J. Sykes Gamble, Esq.	
W. Cairuthers, Esq., Keeper of the Botanical Department, British Museum.	
Dr. I. Bayley Balfour, Keeper of the Royal Botanic Garden, Edinburgh.	**One set of Kashmir and North-Western Himalayan plants.**
Professor Camel, Royal Botanic Garden, Florence.	
Director, Botanic Garden (University), Vienna.	
Professor A. Batalin, Director, Imperial Garden, St. Petersburgh.	
Dr. E. Levier, Florence.	
M. S. Somier, Florence.	

Herbarium.—Mucli progress was made during the past cold season towards completing the arrangement of the collections representing the flora of North-Western and Central India. A considerable amount of unidentified material still remains for future study, amongst which there are probably many undescribed species.

The additions to the herbarium received during the year include—

(1) A large and valuable set #f duplicates from the herbarium of the Royal Botanic Garden at Seebpore.

(2) An interesting collection of Chitral plants sent by Captain Younghusband.

(3) Plants collected during my tour with the Dehra Eorest School students in Jaunsar and in liliri Garhw^l.

(4) Plants obtained by tha native botanical collectors of my Department. Three of these men were thus employ'ted during the summer months, *viz.** Inayat Khan on the hills beyond Murree; Harsukh was sent to the Kurram VaLTey and brought back a large and valuable collection from that district. I am much indebted to Mr. Davis, the Executive Engineer of the Kurram

Valley, for his kindness in superintending the work of this man. Ramsukh was with me in Jaunsar during April and May, and was also employed in that district during October and November under Mr. Gamble, Conservator of Forests, School Circle.

A complete set of the mosses collected during my two tours through Kashmir and Baltistan in 1892 and 1893 was forwarded to Dr. Brothenis at Helsingfors for determination. He has already kindly sent me a list of the names of those collected during the former tour, and amongst them are a great number of species new to science, as well as several European kinds not previously recorded as Indian.

The grasses collected in Kashmir and Baltistan have been identified by Professor Hackel of St. Pölten, Hungary. These collections contain several novelties, including one new genus.

Additions to the Library.-The numerous additions to the library include thg following :—

Experiment Station Records, Wasbington.-Hartio., the Diseases of Trees (English Translation).

Hunter, Sir W. W.—The Indian Empire.

$£?, S T S f t f E "III F.-Materials for the Flc-a of the Malay Peninsula·

Maiden, J. H._The Forage Plants of Australia. (Also a complete set of pamphlets by the same author on the economic botany of Australia.)

Mueller, Baron F> Von.—Iconography of Candolleaceous Plants.

Prain, Surgn.-Capt. D.—Memoirs and Memoranda (Botanical). - Bombav

Talbot, w r A . - A List of the trees, shrubs, and woody climbers of the Bombay P sidenc .

Trimer^ Dr. H—Handbook to the Flora of Ceylon, Part II.

Office establishment.-^ draughtsman, H Hormusji Deboo, has. bejm engaged in the preparation of drawings of some of ,the more interesting plants collected during^recent botanical tours. The Head Olerk and his A*sistant and the rest of the establishment have done satisfactory work duung the year.

SAHARANPUR; *The 10th June 1895.*

J. F. DUTHIE,
Director, Botanical Defartnent, NortUr, India.

APPENDIX.

Financial Statement of the Botanical Department, Northern India, during the year 1894-96.

Botanical Department.	Expenditure.					Receipts.		
	Director's salary.	Establishment.	Travelling allowances.	Contingencies.	Total.	Fodder grass books.	Fodder grass albums.	Miscellaneous.	Total.
	8 a. p.	8 a. p.	8 a. p.	8 a. p.	8 a. p.	8 a. p.	8 a. p.	8 a. p.	R a. p.
Budget grant for 1894-95	10,200 0 0	3,910 0 0	2,600 0 0	2,330 0 0	19,040 0 0				
Expenditure during 1894-95	10,200 0 0	3,713 3 11	2,264 9 0	2,061 5 0	18,239 1 11				
Balance	.....	196 12 1	335 7 0	268 11 0	800 14 1				
Realized by sales during 1894-95	.....	.....	.....	.....	.....	36 15 6	5 4 0	61 2 0	103 5 6

DATED SAHARANPUR;
The 10th June 1895.

J. F. DUTHIE,
Director, Botanical Department, Northern India.

Eeport on the Botanical Survey, Bombay, for the year 1894-95.

1. The collection and identification of species has been continued, and, as the appended list of identified specimens of the Flora of Bombay in the herbarium shows, a considerable advance has been made during the year.

2. The chief part of the collecting work was done by Mr. Ranade and myself during a walking: tour from Poona *to* Nagotra in the Concan. The route traversed lies neaily along the line of the 18° North Latitude irrespective of roads. A detailed account of this journey is appended and specimens of the plants collected are available.

3. One remarkable result of this journey is the discovery of *Phcenix rohusta,* Hook, f., Marathi *Strain,* the tiee from which the "date" matting so common at Poona is made.

4. With the recent addition of *Avfofphophallus commutalus,* Engl., Marathi *Shewal,* the inflorescence of which is used as a vegetable after cooking with the leaves of *Lagerstrcemia parviflora,* Roxb., and the fruit of *Garngapinnala,* Roxb., and of *Sauromatum guttatum,* Scbott., the root of which named *Nnrki acha Tcanda* is sold by the indigenous herbalists *[binds]* for the purpose of increasing the secretion of milk in cattle.

5. Those three prominent plants each with a vernacular name and many others of less prominence noted in the accompanying list lead to the conclusion that the Botany of Western India still repays research in a striking degree.

6. *Sabai or Bhabur Grass.—hchamum angustifoltnm, Hack.,* has proved amenable to cultivation so far as to yield a small crop at the rate of two tons dry grass per acre with slight irrigation and a quantity of seed which is being offered to the public gratis. The cultivation of this grass will be tried without irrigation during the ensuing year.

7i The Sisal Hemp Plants received from you two years ago have now many leaves 3i feet in length and 64 young plants ready to plant out. I have applied for the use of forest land for the purpose, and hope to plant them out soon.

8. The herbarium continues to attract enquiries from merchants and others regarding the vegetable products of the country, and such enquiries would be more numerous were it generally known that the collection of specimens and library maintained here offer facilities for meeting such enquiries.

9. *Contributions.*—Five hundred specimens of the economic plants of India have been sent to the Imperial Institute, London. Fifty-three species of the Cryptogamic flora of Bombay, exclusive of Ferns, have been sent to Dr. T. Cooke, London, who has kindly agreed to obtain identifications by specialists in the various departments.

Eighty species of Glumals have been sent to the Royal Gardens, Kew, and smaller consignments to others.

10. I am much indebted for contributions and assistance to Dr. G. King, C.I.E., Calcutta; Pr. W. T. Thiselton Dyer, C.1,E., Kew; Mr. Abdul Kader Itmar Khan, Karachi; Dr. Lisboa, Bombay; Dr. Kirtikar, Sarma ; Piofessor F. Gleadow, Poona; Mr. M. A. Lawson, OotacamuDd; Mr. J. M. Gleeson, Madras; Mr. *E.* C. Cotes, Indian Museum, Calcutta.

11. Mr. Ranade rejoined from privilege leave on 1st May in improved health.

1£. In considering the work accomplished it should be remembered that the Botanical Suivey of Bombay is conducted as an additional duty, without emoluments, by officers much occupied in educational woik, that it occupies all vacations and holidaj's, and that the travelling allowance is granted in accordance with standing orders which have been designed for work of a totally different class and which, as far as 1 am personally concerned, has never covered actual expenses.

COLLEGE OP SCIENCE ;

Poona, 5lh June 1895.

«• MARSHALL WOODROW,

In chaT9e Botanical Survey, Bombay.

(3, I. C- A 0.-247 R. & A.-7-9-95.-350.-R, N. D.

Report of the Director of the Botanical Surrey of India for the year 1895-96.

The provinces of which the botanical Survey is under the control of the Superintendent of the Botanic Garden, Calcutta, are Bengal, Assam, Burma, and the Andaman Islands. Of these, Assam has received the greatest amount of attention during the year. Dr. G. Watt, who proceeded to Assam to make enquiries into Tea blights during the early months of 1895, having very kindly agreed to supervise the work of a native collector, a Mussalman named Makeem, trained to the work, was sent with him. This collector remained with Dr, Watt until the end of July; and, as during the period of his absence, a large portion of the province was traversed, very interesting collections, both of living and dried plants, were the result. To Dr. Watt my best acknowledgments are due for the great amount of trouble which, besides supervising the operations of this collector, he himself took in the way of sending me well-collected and carefully-ticketed specimens of the more critical species. In January of the current year, this same Mussalman was again sent to Assam under the supervision of Mr. Gisseleire, a trained European collector working on behalf of the Agri-Horticultural Society of India. Mr. Gisseleire's objects being purely horticultural, and those of the collector from this garden being botanical, the interests of the two institutions in no way clashed. The collector returned to this garden in June, bringing with him a considerable collection of dried specimens. My acknowledgments are due to Mr. Gisseleire for the help he gave the collector. In the province of Burma two collectors—one a Eurasian and one a native—were employed. The results were not, however, very satisfactory. Better results were obtained in the Andamans by a native collector who, for a short time, worked under the kind supervision of Mr. V. Portman, to whom my best thanks are due for the trouble he took in helping the collector. Collections of named specimens of dried plants were issued to the herbaria in connection with the Departments of the Survey as follows :—To the Directors of the Botanical Survey of Northern India, 630 specimens, and to that of Bombay, 250; to Mr. J. Sykes Gamble, for the Herbarium of the Forest Scho#, Dehra Dun, 137 ; and to the Madras Herbarium, 122. On the other hand, there were received at the Calcutta Herbarium from the Directors of the Botanical Survey of Northern India, 669 specimens, of Bombay, 34, and from the late Mr. Lawson, Director of Botanical Survey of Southern India, 300. Dr. Prain, Curator of the Herbarium of this garden, while on deputation collected 303 specimens.

2. *Survey of Northern India.—The* report for the year was submitted by Mr. J. F. Duthie, and is herewith forwarded in original. Mr. Duthie did not himself undertake any exploratory tour during the year; but useful collecting work was done in Waziristan by means of native collectors. Part of Mr. Duthie's time was occupied in examining and naming various collections sent from Chitral by officers belonging to the field force, one of which in particular, sent by General Gatacre, C.B., contained plants of special interest; and part was occupied in useful herbarium work at Saharanpur; in visiting the Usar Reserves and the public gardens, in Northern India; and in conducting

examinations at the Forest School. It was not found possible by Government to permit Mr. Dutbie to accompany the Pamir Delimitation Commission, and the work of botanical collection was accordingly delegated to Surgeon-Captain Alcock, I. M. S., who accompanied the Expedition as Surgeon Naturalist. Dr. Alcock brought back a most interesting collection which is now being worked up by Mr. Duthie. The result will be. published, I understand, in a volume on the Natural History of the Pamir Boundary Commission, which it is intended to issue. Mr. Duthie is at present on leave; and he is, I believe, using part of his furlough in the preparation of a Monograph of the Indian members of the Natural Family of *Boraginacece,* to which belong many plants producing brilliant dye-stuffs. During the year Mr. Duthie distributed a considerable number of named herbarium specimens and of seeds of useful plants.

3. *Botanical Survey of the Bombay Presidency.—The* Director, Mr. G. Marshall Woodrow, being absent in Europe on furlough, the report for the year has been prepared by Mr. Hastings Page, Scientific and Agricultural Lecturer at the Poona College of Science, who is acting for Mr. Woodrow as Director. Mr. Page's report, which is a brief one, is submitted in original herewith. Mr. Woodrow, prior to his departure, made collecting tours to Castlerock, Diksal, Manmad, and Kalyan; and Mr. Ranade, his assistant, made various excursions in the Satara District and in the neighbourhood of Ahmednagar and Nandgaon. Some useful specimens and seeds were distributed through the year, and the best appears to have been made of the slender resources of this branch of the survey.

4. *Botanical Survey of Southern India.*—Owing to the death of Mr. M. A. Lawson, the late Director of this Survey, no report has been submitted ; and it is understood that no botanical tours were made during the year' Some months prior to his death, Mr. Lawson sent a valuable collection of Travancore plants to the Calcutta Herbarium. On Mr. Lawson's death, his duties were temporarily performed by Mr. D. Hooper, Government Quinologist. But Mr. Hooper's other duties prevented him from taking any active steps in connection with the survey.

5. *Publications during the year.—Two* numbers of the Records of the Survey (Nos. 5 and 6) were issued during the year. These were :—

(1) No. 5.—Report on a Botanical Tour in the Lakhimpur District, Assam, by G. A. Gammie.

(2) No. 6.—Notes on a journey from Poona to Nagotra, by G. Marshall Woodrow.

6. *Bust in wheat.*—During the cold season the attention of Dr. Prain, Curator of the Calcutta Herbarium, was attracted to an outbreak of rust in some patches of wheat growing in the Seebpore Experimental Farm, which lies adjacent to the Calcutta Botanic Garden. The result of these observations pointed to a certain field-weed, closely resembling the ELglish Dandelion, as the host of the rust which had attacked the wheat at Seebpore. The identity of the host of the rust which attacks wheat in the plains of India has, as you are well aware, long been a puzzle to botanists and others. Dr. Prain's discovery appeared so important that, at my suggestion, and with the permission of the Government of Bengal, and with youi approval, Dr. Prain was deputed to visit some of the wheat-producing districts of the Central Provinces and of Upper India, with the view of extending his observations on this very

important subject. Dr. Praia, in consequence, made an extended tour in these provinces, and also made a dash into the eastern part of the Punjab. The season being far advanced before the discovery was made at Scebpore, Dr. Prain's tour was of necessity very rapid. He succeeded, however, in collecting much information and many specimens, which having been submitted to Dr. D. D. Cunningham, F.R.3. (the only Cryptogamic Botanist in India), have been made the basis of a most interesting joint report by Drs. Cunningham and Prain. This report is now being submitted to you, and it should, in my opinion, be published as No. 7 of the Records of the Survey. The result of this report is to show that the Sesbpore rust is probably only one of four by which wlieat in India is attacked. The enquiry is thus shown to be only in its initial stage.

G. KING, M.B.5
Brigade-Surgeon,
Lieut.-Colonel,
Director of Botanical Survey of India.

Annual Beport of the Director of the Botanical Department, Northern India, for the year 1895-96.

Abstract of Diary for the year.—I was at Dehra on the 1st and 2nd of April, and on the 3rd I started, *vid* Mussoorie, to join the camp of the Forest School students at Chakrata.

From Chakrata I accompanied the senior class of students as Botanical Instructor through the forests of Jaunsar and a portion of Tihri Garhwal, returning on the 20th of May to Deoban where the examinations were held.

I left Deoban on the 1st of June for Mussoorie, and on the 26th o£ that month proceeded to Dehra, and thence to Saharanpur on the 30th. On the 3rd of July I returned to Mussoorie, and remained there till the 30th o£ September.

On the 30th of September I went to Dehra, and arrived at Saharanpur on the 3rd of October.

I remained at head-quarters till the 9th of February, on which day I started on my tour of inspection to visit the Usar Reserves at Aiigarh and Oawnpore, and the Horticultural Garden at Lucknow.

After this I spent a few days at the Royal Botanic Garden, Calcutta, and on my return journey to headquarters visited the Allahabad gardens and the Taj Garden at Agra.

I arrived at Saharanpur on the 2nd of March, and left again on the 15th for Dehra to assist at the final Examinations at the Imperial Forest School, after which 1 returned to Saharanpur, arriving there on the 20th.

Separate reports on my visits to the Usar Reserves, and to the Government Gardens in the North-West Provinces, will be submitted in due course.

BOTANICAL TOUR.

I was unfortunately prevented from accompanying personally any of the Frontier expeditions last year, *viz.*% to Waziristan, Ghitral, and the Pamirs, all of Which offered unusual opportunities for collecting specimens over comparatively unexplored ground. I succeeded, however, by means of my native botanical collectors, and through the kindness of friends interested in the subject, in acquiring a very large number of interesting specimens.

Waziristan.—One of my botanical collectors, Harsukh, was sent off from Saharanpur on the 13th of April, and he spent about five weeks in that country. I am much indebted to Mir Alam Khan, student of the M. A. O. College, whose acquaintance I made at Aiigarh, for the assistance rendered through some relatives of his living in Waziristan. By their help, Harsukh managed to visit Pir Ghal, the highest peak in Waziristan (about 11,500 feet above the sea), also other localities which have not hitherto been accessible to Europeans, or even to natives of Hindustan.

The Political Officer at Wana, Mr. A. J. Grant, was kind enough to give me much useful information regarding the various localities visited by Harsukh, and their approximate elevation above the sea.

Ghitral Relief Expedition.—The botanical results of this expedition were on the whole extremely satisfactory. Three distinct collections were received, the several gatherings amounting to upwards of two thousand numbers.

The largest and most important collection was made by my Head Botanical Collector, Inayat Khan. His work was superintended by Surgeon-Lieutenaat S. A. Harris, I. M. S., who was specially selected for this duty. Thanks

are due to that officer for the very careful record kept of each gathering as to locality, altitude, date, and the colour of the flowers. Specimens were collected all along the route as far as Chitral, and excursions were made from several of the camping grounds up to 11,000 or 12,000 feet. Unfortunately, Surgeon-Lieutenant Harris fell sick during the month of July, and Inayat Khan had to be recalled.

Of other botanical contributions from the country extending between Nowshera and Chitral, the collection made by General Qatacre, C.B., D^S O.» between the months of April and September, is an extremely interesting one. The specimens were collected chiefly in the neighbourhood of the Lewari Pass, Ashreth, Ziarat, Mirga, and the Arnawei Valley. My botanical collector, Harsukh, was sent up to Mirga towards the end of August, and remained with General Gatacre till the latter returned in September to India on his way to England.

General Gatacre secured also the services of other officers interested in botany, notably Surgeon-Major Hamilton, I. M. S., who most kindly sent me a very complete collection of plants from the neighbourhood of Kala Drosh.

***Botany of the Pamir Boundary Commission.*—Owing to the desire on the** part of Government to limit, as far as possible, the number of the party proceeding on this expedition, no officer was specially deputed as botanist. Surgeon-Captain Alcock, I. M. S., Superintendent of the Indian Museum* Calcutta, who was attached to the Commission primarily as the Medical Officer, undertook, however, to collect botanical specimens, in addition to his other work>s Zoologist and Geologist. The collection which he brought back is an extremely interesting one, and contains about 130 species* A complete list of these is included in his report submitted to Government.

HERBARIUM.

Numerous valuable additions have been made to the herbarium collection during the year. Besides the specimens mentioned as having been collected during the various Frontier expeditions, the following contributions should be mentioned:—

1. From the Herbarium of the Royal Botanic Garden, Calcutta, about 600 sheets.
2. From the University Herbarium, Vienna, plants of East Europe, 600-
3. From Professor A. Blytt, Christiania, a large and valuable set of Norwegian plants.
4. From D. Hooper, Esq., Government Quinologist, Madras : a set of plants collected during a tour recently made in Travancore by the late Mr. M. A. Lawson, Director of the Madras Botanical Survey Department.
5. From A. E. Lawrie, Esq., Deputy Conservator of Forests, Coorg: over 200 kinds of flowering plants and ferns besides a large number of mosses and lichens from the Coorg forests.
6. From Colonel A. E. Ward, B.S.C.: a small but interesting collection of plants from the Sasseer Pass, Ladak, at elevations between 15,000 and 17,000 feet.
7. From Surgeon-Captain Alcock : a few specimens of plants from the top of the Burzil Pass, collected by that officer last June on his journey to the Pamirs.

8. From C. W. Hope, Esq.: 24. sheets of ferns *new* to this herbarium.
9. Prom H. A. D. Praser, Esq., R.E.: collection of mosses from Upper Burma.

During my stay at Mussoorie last summer a considerable portion of my time was devoted to herbarium work. The Waziristan collection, and all the Chitral Expedition specimens collected under the superintendence of Surgeon-Lieutenant Harris, were sent to me, and a complete set of each was mounted for the Saharanpur herbarium.

With a view to the preparation of a Monograph on the Indian species of *Boraginece,* the Saharanpur specimens belonging to that family were despatched to me. Also, with the kind permission of Dr. King, I received a complete set of the specimens belonging to the Calcutta Herbarium.

Mr. 0. W. Hope, who is at present the most competent authority on Indian ferns, paid a visit to the Saharanpur Herbarium last January. The collection of ferns here is a very rich one; and with Mr. Hope's assistance in correctly naming and arranging the specimens, its value for reference has been very greatly increased.

Por a similar result in the case of the Natural Orders *Papaveracece* •*Leguminosce, Labiata, Scitaminece,* **and the genus** *Pedicularis,* **I** *owe* **many** thanks to Surgeon-Captain D. Prain, Curator of the Calcutta Herbarium.

Distribution of Herbarium Specimens,

1. To Dr. Brotherus, Helsingfors, Finland : a large collection of mosses from Chitral, the Pamirs, North-Western Himalaya, Coorg, and Upper Burma,

2. To the Herbarium, Royal Garden, Kew: about 200 species of grasses collected in the Kurrum Valley, in Baluchistan, Chitral, the Pamirs, and the North-West Himalaya.

Arrangements are nearly completed for the despatch of several sets of duplicates to various botanical institutions in correspondence with this Department.

Library.—Of the more important additions the following may be mentioned :—

Annals of Botany, Vol. IX (1895).
Annals of the Royal Botanic Garden, Calcutta, Vol. V., Part I (1895).
Engler and Prantl—Die naturlichen Pflanzenfamilien, 4 volumes.
Plora of British India, Parts XIX (1893) and XX (1894).
Booker and Jackson.—Index Kewensis, Fasc. IV (1895).
*Levier, E.*9 A Travers Le Caucase (1895).
Maide, J. #.—Numerous pamphlets on Economic Botany, New South Wales.
Paris JE. G.—Index Bryologicus, Part II (1895).
Trimen, Dr. ^.—Handbook of the Plora of Ceykm, Part III (1895).
Wickson, & J.—The California Fruits, San Francisco (1891).

DISTRIBUTION.

Seeds of Kashmir plants.-To the Royal Garden, Kew; Royal Botanic Garden, Edinburgh; Monsieur H. Correvon, Geneva; Messrs. Damman & Co., **N les.**

^ *Sulbs of Iris and Qroomfrom Chitral* to Dr. M. Foster, F.R.S., Cambridge.

Seed of Cryptomeria japonica.—To the Superintendent, Government Botanical Garden, Saharanpur ; Government Horticultural Garden, Lucknow ; Director, Imperial Eorest School, Dehra Dun.

Lawn-grass see4-~101fo to J. B. Fuller, Esq., C.I.E., C.S., Agricultural Adviser to the Egyptian Government, Cairo.

***Seeds of Field and Garden Crops of Northern India.*—To E. Broadway,** Esq., Superintendent, Botanic Garden, Grenada.

Seeds of Papilionaceous plants.—To the Director of Land Records and Agriculture, North-Western Provinces and Oudh, for trial at the Usar Reserves.

Linseed.— Samples from Rajputana and Berar for the Imperial Institute, London.

Himalaya Horse Chestnut—A consignment of seed sent to W. R-Lawrence, Esq., C.LE.,C.S., England.

***Dried fruits of Indian Trees and Shrubs*—A collection sent to Messrs.** Damman & Co., Naples.

Lacquer Work.—Samples of various articles illustrating the lacquer industry at Saharanpur sent to the Reporter on Economic Products to the Government of India for the Imperial Institute, London.

Fumaria parviftora.—561b of the dried plant to Messrs, Kemp & Co., Bombay.

Office Establishment.—The Draughtsman, H. Hermusji Deboo, has during the year made drawings of several of the more interesting plants recently collected within the botanical area of this Department; he has also commenced a set to illustrate the Indian species of *JBoraginece.*

The Head Clerk, Lala Umrao Singh, and his assistant, Hutchinson, and the rest of my office establishment have worked satisfactorily during the year.

SAHARANPUR } J. F. DUTHIE,
The 29lh April 1896. } *Director, Botanical Department, Northern India.*

APPENDIX.

"Financial Statement of the Botanical Department, Northern India, during tie year 1895-96.

BOTANICAL DEPABTMENT.	EXPENDITUBE.						RECEIPTS.			
	Director's salary.	Exchange com-9nsation allow-ance.	Establishment.	Travelling allowance.	Contingencies.	Total.	Fodder grass books.	Fodder grass albums.	Miscellaneons.	Total.
	R a. p.	R a. p.	R a. p.	R a. p.	R a* p.	R a. p.	& a. p.	R a. p.	& a. p.	R a. p.
Budget grant for 1895-96 .	10,200 0 0	1,460 0 0	4,010 0 0	2,600 0 0	2,330 0 0	20,600 0 0				
Expenditure during 1895-96	10,200 0 0	1,768 4 8	3,673 7 6	1,928 8 3	2,029 14 6	19,600 2 11				
Balance	•••	•••	336 8 6	671 7 9	300 1 tf	999 13 1				
Realized by sale during 1895-96 .	...	•••				...	60 0 0	#••	•••	60 0 0

SAHAEANPTJR ;
The S9ti April 1896.

J. F. DUTHIE,
Director, Botanical Department, Northern India.

Report of the Director of the Botanical Survey of Bombay for the year 1895-96-

The Department of Botanical Survey in connection with the College of Science has continued its usefulness in having been available to many enquirers on various matters connected with the economic products of the Bombay Flora, as well as in the identification of specimens, and supply of different parts of plants to many applicants.

*Botanical Tour**.—Botanical tours have been conducted in various parts. Mr. Woodrow has travelled through Castlerock, Diksal, Manmad, and Kalyan. Mr. Ranade has visited Shingnapur (Sattara District), Badlapur, Vajrabai, Ahmednagar, and Nandgaon; and the plant collector, Rowjee, has obtained specimens from Singhad, Akoli (Tana District), Mahableshvar, and Nandgaon.

These tours, it will be noticed, have mostly begn to places not far from Poona. The reason for this is that the officers engaged in them have also to impart regular instruction to classes at the College of Science during the college terms, and therefore can only manage a Friday to Sunday excursion, or utilize some Government holidays for the work.

I purpose going shortly on excursions of greater distance, now that the monsoons have covered the Presidency with vegetation ; and longer tours will also be conducted during the cold weather vacation (September to November), the cold weather vacation being the beat opportunity for botanical tours.

Addition, of specimens to Herbarium.—The Herbarium has been enriched by additions of our own collecting, such as :—

Amorphophallus bulbifer, Blume.
Fagraa obovata, Wall.
Eria Lichen or a, Lindl.
Jthamnus triqueter, Wall.
Olax scandens, Roxb. (in fruit).

In obtaining the identification of specimens, Mr. Woodrow desire* especially, to gratefully acknowledge and thank Mr. C. B. Clarke, of Kew, who has mad*,a special stu^vZf that difficult family, for his kind and ready assistance in looking over and checking the ēōLc- tion of *Ct/peracece,*

The identification of some new grasses has been obtained; while names of many other species of *Graminece* are expected which were sent to Kew in connection with *th* J* K• +• of that family for Sir Joseph Hooker's Flora of India conaect™ ™&the elaboration

***Fungi, Lichens, Arums.*—Collections of some Fungi, Lichens, and Arums have been made by Mr. Woodrow, and the photographs taken of these show some remarkable forms and constitute a most valuable album. Reference to this book would be highly prized by those interested in the subject.**

***Mosses*.** - A Bomber of mosses W bsen grfbered from vation, **locslitie.** **and have been formed into** **under which they were found, together with the dat**

***Chara and Nitella*.—Some specimens** **Western India have been collected and their identification obtained from Kew.** ol Cinn *

Among others :—

Chara zeylanica, **Willd.**
„ *fragilis,* **Desv.**
„ *contraria,* Kneltz.
*Nitella hyalina^* Ag.
„ *oligospira.*

***Inward contributions*.—I am indebted to many gentlemen for contributions to the Herbarium, and I am especially under obligation to Dr. King, F.R.S., C.I.E., Director, Botanical Survey of India, for a collection of 250 sheets of useful specimens, and for several varieties of seed.**

Gardens, Madras. ou Penotendent, Agn-Horticultural Society's

Outward contributions.—Demands for various products have been met, and specimens supplied to those interested in them. The following are a few examples in this connection: —

To Dr. King, F.R,S., C.I.E., Director, Botanical Survey of India :—

1. Eighteen living plants.
2. Collection of rhizomes of two species of *Satürnine a.*
3. Sets of Herbarium specimens of *Cyperacea.*
4. Three sets of specimens illustrating the manufacture of Poona date-matting.

To the Survey Commissioner and Director of Land Records and Agriculture, Bombay :—

Roots and stems of rough and smooth leaved varieties of *Rubia cordifolia.*

To the Director, Royal Botanical Gardens, Kew :—

Living plants.

Specimens and photographs of Fungi.

To the Honorary Secretary, Natural History Society's Museum, Bombay:—

Set of specimens of *Cyperacece* of the Bombay Presidency.

To the Survey Commissioner, and Director of Land Records and Agriculture :—

Roots of *Gymnema sylvestre.*

Sabai seed and plants supplied.—Many applications were received for sabai seed, and the stock was soon exhausted. The following are some of those to whom various quantities were despatched :—

Messrs. W. Graham & Co.
G. K. Betham, Esq., Divisional Forest Officer, Dharwar.
J. Dickenson & Co.
The Collector, Surat.
The Principal, Kala Bhavan, Baroda.
The Deputy Collector, Belgaum.
The Divisional Forest Officer, Khandeish.

References to the Herbarium.—Information on many subjects was supplied to several correspondents:—

To the Chief Commissariat Officer, Poona,—Identification of grasses and opinions as to their value for cut and grazing forage. Identification of grasses used as fodder for horses and other purposes by the Army Veterinary Department, Kirkee.

In conclusion I would explain that I have held my present appointment for a few months only, and I regret that my term of office did not include the September to November vacation of my college, so that J might have had better opportunities for work in this Department which is so full of interest and offers so large a field for thought, investigation and experiment.

HASTINGS M. PAGE, F.I.C, F.G.S.,

^*Acting Scientific, Botanical and Agricultural Lecturer.*

HERBARIUM, COLLEGE OF SCIENCE,
POONA ;
The 7th July 1896.

Beport of the Director of the Botanical Survey of India for the year 1896-97.

During the year 189(5-97 botanical exploration was conducted as extensively as the funds at my disposal permitted, and, in addition to the work done by collectors in the pay of the Department, assistance was kindly given by officers unconnected with it. Dr. G. Watt,C.I.E., who made a prolonged tour in Northern Bengal and in part of Assam in connection with an enquiry into the growth of Rhea, contributed many plants of much interest collected during his tour. Dr. Watt's specimens, which were in excellent condition, were accompanied by valuable field notes. Towards the beginning of the current year, three native collectors were sent to explore the remoter parts of the Khasia Hills. Mr. R. Pantling, now Deputy Superintendent of the Cinchona Plantation, who is not an officer of the Survey, was go3d enough to devote some weeks of privilege leave which were due to him in accompanying and guiding the party. The result of the presence with the collectors of an officer so energetic and enthusiastic as Mr. Pantling, was that a most interesting collection, both of living and dried plants, was sent to the Herbarium. This collection was particularly rich in the smaller species of orchids which are so apt to be overlooked by ordinary collectors. Mr. S. E. Rita, Extra Assistant Commissioner, was also kind enough, both himself to collect, and to superintend the working of some native collectors in the Jaintia Hills; and by Mr. Rita's exertions many most interesting plants were brought together and sent to Calcutta. To Dr, Watt, Mr. Pantling, and Mr. Rita my best acknowledgments are due for having made the collecting operations of last year in Assam more fruitful than any that have been carried on in that province for some tim?. In the province of Burma collections were made for some months by a native col« lector working in the Shan Hills. These were not, however, very satisfactory, and the collector's services were dispensed with. Towards the end of the year a Mussalman collector, named Mokeem, was sent to.Myitkyina, on the Kachin Hills, to work under Lieutenant Cruddas, I.S.C., who very kindly consented to help him. Mokeem did very good work in Assam during 1894.95, and I trust the collections to be sent by him during 1897-93 may prove satisfactory. Mr. G. McD. Peche, of Moulmein, did some collecting? during the year, and some interesting specimens were obtained through him. Towards the end of the year Lieutenant E. Pottinger, R.A., started on his exploration of the valley of the Irrawaddy from Myitkyina northward. This afforded an excellent opportunity for the botanical exploration of a country hitherto absolutely unknown, and Lieutenant Pottinger was good enough to take charge of a botanical collector. The results will be dealt with during the current year. Mr, H. J. Davies, Assistant Curator of the Botanic Garden, was sent on a short collecting tour to the Andamans, and brought back a number of interesting specimens both living and dried.

2. *Survey of Northern India.*—The report for the year, which was prepared by the Director, Mr. J. F. Duthie, is herewith submitted in original. For about seven months of the year Mr. Duthio was on leave in England,, and

Mr. Q. A. Gammie, of the Bengal Cinchona Plantation, acted for him. During Mr. Gammie's incumbency he made a tour in the Kangra and Chamba Districts, and returned with good collections. An account of Mr. Gammie's tour is to be printed in the records of the Survey. During the rest of his time Mr, Gammie did good work in the Saharanpur Herbarium. The five months spent in India by Mr. Duthie were devoted to herbarium work, to inspection of the Govern* ment gardens and Parks at Lucknow, Allahabad and Agra, and of the Usar Reserves at Aligarh. Mr. Duthie also conducted the botanical part of the examinations of the students of the Imperial Forest School at Dehra Dun. Through the kindness of Major-General Gatacre, C.B., D.S.O., Commanding at Quetta a botanical collector was permitted to accompany him on his tour of inspection during the months of May and June, and a large number of interesting specimens were thus acquired. Inyat Khan, Mr. Duthie's chief native collector, was absent in Hazara from May to August, during most of which time he travelled under the protection of Mr. A. V. Monro, of the Forest Department, and the collections obtained were very good.

3. *Survey of the Bombay Presidency.*—Mr, G. Marshall Woodrow, Direct-OT of the Survey, submits the report for the year which is also herewith forwarded in original. Mr. Woodrow was on furlough during the earlier months of the year, during which time his duties were carried on by Mr. Hastings Page, of the Poona College of Science. After his return, Mr. Woodrow made an investigation of the Botany of a hill 15 miles south-east of Poona, an offshoot of the Western Ghats. Mr. Woodrow has submitted a list of the plants collected on this hill, so far as they have been determined. Mr. Woodrow has also forwarded with his report copies of two interesting papers contributed by him to the Bombay Journal of Natural History. The first of these consists of a list of the Thalamifloral plants indigenous to the Western Presidency; the second is a list of the plants found growing in a swamp near Bombay. During the year, Surgeon-Captain Maynard, I.M.S., accompanied the Beluch-Afghan Boundary Commission as Surgeon-Naturalist. Dr. Maynard made as full collections of plants as circumstances permitted, and these were identified by Surgeon-Major D. Prain, Curator of the Calcutta Herbarium. Dr. Prain's botanical identifications having been combined with Dr. Maynard's notes, a very interesting paper was the result; this paper was published during the year as No. 8 of the records of the Survey.

4. *Survey of Southern India.*—For the second time no annual report has been submitted from this survey, which is understood to be in abeyance for the present.

5. In the report of last year reference was made to the successful beginning made by Dr. Prain in the discovery of the host-plants of the fungus which causes rust in Indian wheat-fields. The prevalence of famine during the year under review prevented any further enquiry being made in the field into this interesting matter. Dr. Prain, however, devoted much time to the preparation of a précis of the literature of rust which is now in the hands of Government.

G. KING, M.B.,
Brigade-Surgeon,
Lieut.-Colonel,
Director of the Botanical Survey of India.

Annual Report of the Director of the Botanical Department, Northern, India, for the year 1896-97.

I was at Head-quarters for the whole of April, and on the 2nd of May I made over charge to Mr. G. A. Gammie, and left for England on 6 months* furlough.

On the 23rd of November I took over charge from Mr. Gammie at 8aharanpur, and remained at Head-quarters until the 3rd of February.

On that date I went to Lucknow to inspect the Government Horticultural garden and parks, and thence to Cawnpore to visit the XJsar Reserves and the Government Farm. Having obtained permission to spend a few days at the Calcutta Botanic Garden, I arrived there on the 11th of February, and left on the 23rd for Allahabad, and inspected the Kushru Bagh and other gardens which are under the management of Mr. Phillips. From Allahabad I went to Agra to inspect the Taj Garden, and thence to Aligarh to visit the Usar Reserves, returning to Saharanpur on the 28th.

I remained at Head-quarters till the 11th of March, on which date I went to Lahore to visit the Agri-Horticultural Garden, returning to Saharanpur on the 14th.

On the 18th I left for Dehra to assist at the final examinations at the Imperial Forest School, and returned to Head-quarters on the 28th.

BOTANICAL TOURS.

Baluchistan.—General W. Gatacre, O.B., D.S.O., Commanding at Quetta, very kindly invited me to send one of my botanical collectors to accompany him on his tour of inspection through his district during May and part of June. Harsukh was deputed for this work, and a large number of very interesting specimens were collected at various places along the route.

*Hazara**—Inayat Khan, the head botanic [illegible] Mr, was sent off early in May to collect plants in that district, [illegible] away tor about four mdnihs, and during the greater part of that time he was travelling under the charge of the Deputy Conservator of Forests, Mr. A. V. Monro, who gave him much assistance.

The Kagan and Siran valleys were explored, and a large and valuable collection, including some novelties, was brought back.

Rangra and Chamba.—Mr. Gammie left Saharanpur on the 13th of August for a short tour in these districts. A very good collection was made, and a complete set lias been mounted for the Saharanpur herbarium, in which the flora of that portion of the Himalaya was rather poorly represented.

HERBARIUM.

The chief work undertaken during the year in connection with the herbarium has been the determination of the numerous specimens collected during recent tours; the incorporation of complete sets of these in the Saharanpur herbarium; and the preparation of duplicate sets for distribution to Calcutta and to British and continental herbaria. A certain number of the natural orders in the Saharanpur Herbarium have lately received special attention, and, are now in a satisfactory condition for reference. In regard to the *Pjxpaver. acece, Leguminosa** and *Labiatce,* I must again acknowledge my indebtedness to Surgeon-Major Prain, who, whilst working up the materials of these

families in the Calcutta Herbarium, was kind enough to communicate tJ* results of his investigations in regard to the Saharanpur specimens.

Mr. G. A. Gammie, whilst acting for me last year, did a great deal of useful work in the herbarium. The family Rubiacea, in which he is specially interested, is now arranged satisfactorily as to the species, and throughout the herbarium I have noticed the results of his handiwork.

In addition to the large sets of specimens obtained during the tours in Baluchistan and Hazara, and to those collected by Mr. Gammie in Kangra an* Cbamba, the following contributions were received :—

From the Royal Botanic Garden, Calcutta; 315 sheets, including duplicates of a set of Strachey and Winterbottams* Kumaun and Kashmir plants, and a set of plants collected by the Medical Officer attached to the Perso-Baluchistan Boundary Commission.

From the Royal Gardens, Kew ; 202 species of Indian grasses named by Sir Joseph Hooker.

From the Director of the Imperial Garden, St. Petersburg!); 257 species from Turkestan, the Caucasus, etc.

From J. M. Wood, Esq., Natal; 104 South African plants.

From G. A. Gammie, Esq.; 85 species from the Sikkim-Himalaya.

From G. M. Woodrow, Esq., College of Science, Poona; 12 species of rare grasses from the Bombay Presidency.

From Colonel J. Davidson, Commanding at Chitral; 20 species collected on the Dorah Pass, north of Chitral.

From C. E. Pitman, Esq. ; 11 kinds of ferns collected in the Chitral District.

From J. W. Oliver, Esq., Conservator of Forests, Upper Burma; a collection of mosses collected in the neighbourhood of the Ruby Mines.

Dist^y ^ - f Herbarium Specimens.*

-*!..&.. * n ^ ™ j ^ J ^ ® Beluch-Af[illegible] Garden, Calcutta, an(i to the Royal Herbarium, Kaw^laita from Chitral, Waziristan, Kashmir ana[1] &* North-West Himalaya were sent; also a set of named mosses collected in Kashmir in 1808.

To the Keeper of the Botanical Department (Natural History Museum), South Kensington, plants from Kashmir and the North-West Himalaya were «mt ; also a set of named mosses collected in Kashmir in 1893.

Sets of herbarium specimens from Kashmir and the North-West Himalaya were also despatched to the Herbarium of the Royal Botanic Garden', Edinburgh ; to the Director of the University Museum and Botanac Garden, Vienna ; to the Director of the Royal Botanic Garden and Museum, Berlin; to the Director of the Imperial Garden, St. Petersburgh; to Professor A. Blytt, Christiania; to Professor T. Caruel, Director of the Botanic Garden, Florence; to Professor Bureau, Natural History Museum, Paris; to Monsieur Casimir de Candolle, Geneva, to Dr. E. Levier; and to Monsieur S. Sommier, Florence.

A large collection of herbarium specimens of Indian economic plants was sent to Professor A. Krasnow, Professor of Botany, Cracow, Russia.

Bulbs and seeds.-Cvocm and Iris bulbs from Chitral, and Iris bulbs from Hazara were sent to Dr. Michael Foster, Cambridge. Seeds of various North-West Himalayan plants were despatched to Kew, Vienna, St. Petersburgh, Cambridge, the Royal Horticultural Society of Tuscany in Florence, and to Monsieur A. Correvon in Geneva. Professor F, Lamson-Scribuer, Agrostolo-

gist to the United States Department of Agriculture, was supplied with a packet of seed of *Sporobolus Arabicus ;* and to the Director of Land Records and Agriculture, North-Western Provinces and Oudh, seeds of various kinds of Eucalyptus were sent for sowing in some of the Usar Reserves.

Library.—Of the numerous books and pamphlets received during the year, the following may be specially mentioned :—

Annals of Botany, Vol. X.

Annals of the Royal Botanic Garden, Calcutta, Vol. V, Part II, Vol. VI, Part I, and Vol. VII.

Engler and PrantL—Die naturlichen Pflanzenfamilien (several parts).

Experiment Station Records of the Agricultural Department, Washington, Vols. VI, VII, and VIII.

Flora of British India, Part XXI.

Index to Watt's Dictionary of Economic Products of India.

Kew Bulletin.

King and Planting. Some new orchids from Sikkim.

Maiden, J. H.—Useful Australian plants. Some New South Wales plant worth cultivating.

Paris, E. G.—Index Bryologicus, Part III.

Photographs taken during the Ohitral Relief Expedition (1895), under the direction of General W. Gatacre, C.B., D.S.O.

Lamson-Scribner, F.—Useful and ornamental grasses of the United States of America.

Statistical Atlas of India (2nd Edition, 1895).

Tear Book of the United States Department of Agriculture (1895).

A new catalogue of the library was prepared last year by Mr. Gammie.

The Flora of British India.—The completion of this very important; work, commenced by Sir Joseph Hooker in 1872, is an event worthy of record for all students of Indian Botany. An excellent basis is now available for the preparation of local floras, for which there is undoubtedly a considerable demand in certain parts of India.

Notes on some Economic plants not alluded to in Dr. Watt's Dictionary of the Economic Products of India.

Convolvulus microphyllus,* Sieb, *as a famine food plant in the North-Western Provinces.—Mr. J. B. Fuller, C.S., O.I.E., Collector of Allahabad, sent to me specimens of the above for identification, together with the following interesting information :—

« The scarcity in this part of the district (Bhowpur, Cawnpur) is so great that the wages they (the famine labourers) get is hardly sufficient for one full meal. To make up the deficiency they use this herb or jungle grass as food, which they call < Sikhouli.' They powder the leaves and mix it with the cheapest bajra or jowar flour, and cook it something like black bread. (Extract of letter from Qazi Mohammed Hussain, Naib Tehsildar to Mr. Fuller, dated 26th March 1897)/'

A copy of this communication was sent to Dr. Watt, who remarks—

"It is very interesting, both the fact that it is edible and its vernacular name. I have noted the above facts in the dictionary/'

Seneoio nudicaulis, Eam.-This species is much valued by the inhabitants of Jaunsar, and very probably by those of other Himalayan districts, as a medicinal plant. The pounded leaves made into pills are taken as a cure

for fever, and also to check diarrhoea. An application of the leaves is regarded as a good remedy for headache.

OFFICE ESTABLISHMENT.

The Draughtsman has occupied his time chiefly in preparing drawings of the Indian *Boraginece.* He understands now very well how to dissect flowers and to make analytical drawings under the miscroscope.

The Head Clerk, Umrao Singh, and his assistant, Hutchinson, have worked very creditahly during the year, and I am satisfied with the manner in which the other members of the establishment have performed their duties.

MUSSOORIB; *The 13th June 1897.*

J. p. DUTHIE,
Director, Botanical Department, Northern India.

APPENDIX.

Financial Statement of the Botanical Department, Northern India, during the year 1896-97.

BOTANICAL DBPABTMENT.	EXPENDITUBE.							RECEIPTS.			
	Director's salary.	Exchange Compensation Allowance.	Establishment.	Travelling allowances (Gazetted officers).	Travelling allowances (establishment).	Contingencies.	Total.	Fodder grass books.	Fodder grass albums.	Miscellaneous.	Total.
	£ 0. p.	8 a. p	£ a. p.	& a. p,	# a. jo,	R a. p'	£ a. p.	R a. p.	R. a. p.	R a. p.	R a. p.
Budget grant for 1896-97 ,	10,200 0 0	1,960 0 0	4,070 0 0	2,250 0 0	350 0 0	2,250 0 0	21,080 0 0	...	...	...	...
Expenditure during 1896-97 .	7,146 12 0	861 5 4	3,832 0 0	4,421 6 0	202 6 0	2,094 0 5	15,557 13 9	...	...	...	...
Balance .	8,053 4 0	1,098 10	238 0 0	828 10 0	147 10 0	155 15 7	5,622 2 3	...	...	...	...
Realized by sale during 1896-97	...	...	...	...	...	...	...	80 0 6	...	...	SO 0 6

SAHARANPUR; 1
The 14th June 1897. f

J.F.DUTHIE,
Director, Botanical Department, Northern India.

Report on the work of the Botanical Survey of Bombay for the year 1896-97.

1. I was on furlough during a portion of the year under report, and on my return I entered vigorously on the examination of specimens which had been collected during previous years, and found many species not recorded as Bombay plants and a few undescribed.

A list of the flora of Western India as far as printed is attached, marked Appendix I.

2. The annual tour was devoted *to* the thorough investigation of the flora of a hill 15 miles south-east of Poona.

This hill is an offspur of the Western Ghâts, and its flora may be taken as typical of a wide range of country on the western verge of the Deccan.

A list of the plants collected is attached, marked Appendix II. Several species of Glumals have not yet been collected. I hope to complete the list during the current season.

3. The flora of a swamp near Bombay has also been carefully examined, and *Seoparia dulchy It.* found for fche first time in Western India since the institution of the Botanical Survey.

A printed list of the plants found is appended, giving an attempt at classification with regard to the effects of salt; it is marked Appendix III.

4. The growth of Sisil hemp continues to promise profitable results as a fence plant in the Deccan, and as a crop adapted for the most exposed positions on the Western Ghats under a heavy rainfall. A single offset planted out three years ai?o at Khandalla, where the rainfall is excessive, has now leaves 4 feet in length; it is planted in stony soil, and has not received special culture.

A plantation of 170 young offsets has been made near Nandgaon on the crest of the "Western Ghâts, 12 miles south of the railway station at Lanauli.

A quantity of Sisil hemp has been prepared from plants grown at Poona and despatched to Kew for the opinion of experts regarding its value.

The rope-makers of this neighbourhood say the fibre is much stronger than that of *Agave vivipara* which the plants greatly resemble.

5. The following recently introduced trees are thriving so well that they may be considered established:—

Acacia Burkei, Benth.—The Anna Tree of Damaraland, of which seed was received from Kew in 1885, is now a fine tree of 40 feet in height. It is planted in a group of indigenous species of *Acacia* and has attained as great height and nearly as much bulk as the most vigorous species, *Acacia ^tma,* Kurz.

Swietenia macrophylla, King, raised from seed received from Botanical Garden, Calcutta, in 1879, has attained 30 feet in height with a fine clear stem, at Poona, in places where it is watered occasionally, and at Bombay it promises well as a roadside tree. The last supply of seed received from Calcutta I made over to the Officer in charge of the Dang forests. IiTthe moist climate of that district I believe it will be successful as a forest tree.

Myrospermum toluiferum raised from seed received through the Agri-Horticultural Society, Madras, in 1893, has developed fine young trees, which appear very much at home, and *Coffea itenopMla,* from seed received from the same society is growing vigorously.

Macadamia temifolia, raised from seed received from Mr. Corrie, of Brisbane, in 1890, has grown slowly but healthily both at Poona and at Khandalla, and promises to be a useful tree*

Distribution of herbarium specimens, plants, roots and bulbs and seeds :—

346 herbarium specimens.
1,000 plants.
3,000 roots and bulbs.
30 packets seed.

Receipts,

430 herbarium specimens.
300 plants.
10 packets seed,

COLLEGE OF SCIENCE, POONA.
POONA;
The 28th June 1897.

G. MARSHALL WOODROW,
Lecturer in Botany and Agriculture,
In charge Botanical Survey, Bombia,.

Bsport of the Director of the Botanical Survey of Bombay for the year

APPENDIX I.

THE FLORA OF WESTERN INDIA.

BY G. MARSHALL WOODROW, LECTURER IN BOTANY, COLLEGE OF SCIENCE POON±.

PAHT L.

(Bead before the Bombay Natural History Society on. 18th March 1897.)

Since the date of the Bombay Flora, by Dalzell and Gibson, a considerable advance has been made in the number of plants observed, and a few interesting links in the chain of relationship to each other and to foreign floras having been found, it is thought desirable to puhlieh a synopsis of the flora of Western India—as at present known—within the limits of the Bombay Presidency. The list will include the scientific and vernacular names, reference to a description, and will state the place whence, and the time when, specimens were procured. The greater part of the observations are the work of the members of the Botanical Survey Bombay ;* when otherwise the name of the observer will be given, and it is hoped that during the progress of the publication numerous facts will be presented^ which may be embodied in an appendix. In work of this nature we meet with the names of men who have devoted part* of their time aud talents to the elucidation of the flora, and a wish to know more of the lives and doings of those men grows with the study of their work, and it is probable that members of the Society may be in possession of facts regarding those early workers in the Botauy of Western India, and also regarding some others whose names have been omitted, which it is desirable to record.

Of the names connected with our botanical history, Jacquemont, Hiigel and Hove have left indelible marks; of Graham and Gibson, the names and virtues are carved in stone; Stocks and Dalzell have left voluminous records of their interest in Botany; Law and Nimmo, Noton, Ritchie, Sykes and Vaupel are names one seeks to know more about ; De Crespigny, Medical Officer at Ratnagiri, who was the friend and companion of Stocks and communicated much of his work to the herbarium at Poona, died in the winter of 1894-95, full of years and honour ; of Sakharam Arjun and Narayen Daji, we have pupils and co-adjutors with us who hold their names in reverence. Recently we have lost Chester MacNaghten, Principal of the Rajkot College, who was untiring in work at botanical problems, and Carstensen, who restored the faded beauty of the Victoria Gardens. The brothers Sir George and the Hon. H. M. Bird-wood ; Theodore Cooke, Nairn, Young and Wellington Grey have returned to Europe, but continue their interest unabated. Lisboa's devotion to the study of grasses has unfortunately injured his health severely; etill we hope yet to benefit by his admirable ability in research.t From MacDonald and Kirtikar, Talbot, Gleadow, Dalgado, Jaikrishna and B. B. Nene we may still look forward to years of good work ; and from Mesani and Ranade, as yet in their botanical adolescence, we have much to expect.

In a review of this kind it must not be forgotten that a very important share of our work is due to the authorities of the Botanical Gardens at Kew aud Calcutta. Our facilities for the determination of species are as yet so sparse that it is not safe to describe; a plant as new without reference to those centres, and their courteous attention to specimens submitted requires grateful acknowledgment.

In the following list Mr. N. B. Ranade, Herbarium Keeper in the College of Science, has given the vernacular names and much assistance in verifying statements. Many of the Southern names have been taken from Mr. Talbot's Systematic List of the Trees, Shrubs, and Woody Climbers, Bombay Presidency.

ABBREVIATIONS.

F. B. I. = Flora of British India, Hooker.
B. F. = Bombay Flora, Dalzell and Gibson.
Watt. Diet. = Watt's Dictionary of Economic Products of India.
Roxb. F. I.=Roxburgh's Flora Indica.
Kew Bull. = Bulletin of Miscellaneous Information, Royal Gardens, Kew.

• Dr. Theodore Cooke, Principal, Collrge of Science, 1890-93 ; Mr. G. Marshal Woodrow, Lecturer in Botany. College of Science, 1890 ; Mr. N. B. Ranade, Herbarium Keeper, College of Science, 1890.

t Dr. J. C Lisbo* died at Puona, 1st May 1S97.

Graham Cat. = Graham's Catalogue of Bombay Plants.
Hook. Icon. = Hooker's Icones Plantavum.

SYNOPSIS OF THE FliORA OF WESTERN INDIA.

1.—RANUNCULACEJE.

1. *Clematis.*

C. smilacifolia, *Wall.*, F.B.T.—J-3. Evergreen forestB, N. Kanara, *Talhot.*
C. triloba, *Heyne,* F.B.I.—1-3. *Mor-veZ, Ranjdi.* Mawal, Poona. Oct.
C. Gouriana, *Roxb.*, F.B.I.—1-4. *Mor-vel.* W. Ghåts, Nasik, Belgium. Dfc.
C. hedysarifolia, DC, F.B.I.—1-4. *Bendrichi-vel.* Dacg, Mabableshwar, N. KanaTa. Oct.—Nov.
C. Wigbtiana, *Wall.*, F.B.I.—1-5. *Mor-vel.* Mabablesbwar. Jan.
C. sp. *specimens imperfect. More hat ha** Waghait Dang.

2. *Naravelia.*

If, zeylanioa, DC!., F.B.I.—T-7. Divimana, N. Kanara. D^c.

3. *Thalictrum.*

T, Dalzellii, *Hook.*, F.B.I.—1-13. Purandbar. Ang.

7. *Ranunculus.*

B. sceleratns, *Linn.*, F.B.I.—1-19. Banks of Indus, Sukkur. March.

15. *Delphinium.*

J>. dasyoaulon, *Fresn.*, F.B.I.—1-25. Hill near Junnar, Khadkala. Aug.—Sept.

II.—DlLLENIACBuE.

6. *Dillenia.*

D. indica, *Linn.*, F.B.I.—1-36. *JSfotha Karmal.* Bansda, Wadee, Hirdosbee.
D. pentagyna, *Roxb.*, F.B.I.—1-38. *Karmal.* Dang, Sakarpatbar, W. Gbåts. Feb.—Mar.

III.——MAONOLIACE£.

6. *Michelia,*

M. cbampaca, *Linn**, F.B.I.—1*42. *Sonchapha.* Widely planted.

IV.—ANONAGB£.

2. *JJvaria,*

N. narum, *Wall.*, F.B.I.—1-60. *Narampanal.* Parwar Gbåt, Feb.—Mar.

5. *jLrtabotrys.*

A. odoratissimus, 22. *Br.*, F.B.I.—1-54. *Hirvà chdphd.* Gardens widely.
A. zeylanious, JH"./1 <$ T., F.B.I.—1-58. V>ivimana. Nov.—Feb.

9. *Unona.*

U. farinosa, *DaZz.*, F.B.I.—1-58. Hatkbambe near Ratnagiri. Oct.
TJ, discolor, Var, I., F.B.I.—1-59. Sivapur Wadi, in fruit. Feb.
TJ. Lawii, *H.f. &f* T., P.B.I.—1-59. Konkan, *Law.*

10. *Polyalthia.*

P. longifolia, *Benth. $ Hooker,* F.B.I.—1-62. *Ashok.* Planted widely. Mar.—Apl.
P. fragrans, *Benth. &f Hooker,* F.B.I.—1-63. *G-aurik.* Sivapnr Wadi.
P. ceraaiodes, *Benth. # Hooker,* F.B.I.—1-63. *Humb.* Tbul Gbåt. Feb.—Mar.

15. *G-oniothalamus.*

• G. cardiopetalus, *H.f. $ T.*, F.B.I.—1-75. Divimana Ghåt. Feb.

16. *Anona,*

A. aq\iamosa, *Linn.*, F.B.I.—1-78. *Shitaphal,* custard apple. Cultivated.
A. reticulata, *Linn.*, F.B.I.—1-78. *Ramphal,* bullock's heart. Platted.
A. muiicata, *DC,* B.F. Supp. 2. *Kate ramphal,* Sour-sop. Planted. Nov.__Feb.

r> 12. *MiliusaA*

M. indica, *Zesch,* F.B.I,—1-86. Potali, Nilkund, N. Kanara. Mar.—May.

20. Saccopetalum.

S. tomentosum, *Hooker,* P.B.I.—1-88; *Wumb.* Tulkut Ghat, *Dalzell.* April.

22. Orophea.

O. zeylanica, *Hooker, f. $ T.,* P.B.I.—1-90. Bodeli, io fruit, April

23. Bocagea.

B. Oalzellii, *H.f. # T.,* F.B.I.—1-92. *Sajeri, Undi.* Matheran, N. Kanara, *Talbot.* Oct.—Nov.

V.—MENIBFBBMAGEJB.

3. Tinospora.

T. malabarica, F.B.I.—1-96. *Miers.,* Konkan, *Dalzell.*
T. cordifolia, *Miers.,* P.B.I.—1-97. *Gulvel.* Konkan, widely planted. April.

6. Anamirta.

A. Cocculus, *W. 8f A.,* P.B.I,—1-98. *Kdkmdri.* Marmagoa, Konkan, in fruit. January.

10. Cocculus.

C. macrocarpus, *W. Sf A.,* P.B.I.—1-100. *Vatoli.* Matheran road, Konkan. February.
C. villosus, *DC,* F.B.I.—1-101. *V&san-vel.* Western India, widely. September—February.
C. LeaBba, 2>C, P.B.I.—1-102. *Parwatti, Vehri, lllar-billar.* Sind.

12. Stephania.

S. hernandifolia, *Walp.,* F.B.I.—1-103. *Vanatik tika.* Hills near Junnar, in fruit. October.

1Z. Cissampelos.

C. Pareira, *Linn.,* F.B.I.—1-103. *Veni-vel.* Tullegaum, Poona, Guzerat, widely. September.

14. Cyclea.

C. Burmanni, *Miers.,* F.B.I.—1-104. *Pakur.* W. Ghats, Konkan. May.
C. peltata, *H.f. Sf T.,* F.B.I.—1-104. *Par-vel.* Konkan.

VII. NYMPH.EACB.2B.

2. Nymphcea.

N. lotus, *Linn.,* F.B.I.—1-114. *Kamal.* Widely planted in tanks. August—February.
N. stellata, *Tfilld.,* F.B.I.—1-114. Barely planted in tanks.

5. Nelumbium.

N. speciosum, *Willd.,* F.B.I.—1-116. *Bishee Kamal, Padma,* Sacred Lotus. Widely cultivated in tanks.

VIII.—PAPAVBBACB2B.

I. * *Argemone.*

A. mexicana, *Linn.%* F.B.I,—1-117. *Pivld dhotrd, Bingan,* Peint Taluka.

IX.—FUMABIACBiBi

4. *Fumaria.*

1. P. parvifiora, Zaiw^.f F.B.I.—1-118. *Shdtra, Pit-papda.* Deccan, Khandesh. September—December.

X.—CBUCIFEB2E.

5. *Nasturtium.*

N. officinale, *B.Br.,* F.B.I.—1-133. Water-cress. Streams in Poona City, Panohgani. Spring.
N. indicum, *DC,* F.B.I.—1-134. Poona. January.

8. Cardamine.

C. subumbellata, *Hook.fiU* F.B./.-I-138. Ahire, 10 miles west of Poona. August.
C. hirsuta, *Linn.,* var. sylratica, F.B.L-I-138. Khandalla, W. Ghats. December.

II. Farsetia.

tf\ Jacquemontii, *Hook.f. $ T.,* F.B.I.—1-140 *Farid butu* Sibi, Sind. Angnst—January.
F. Hamiltonii, *Boyle,* F.B.I.—1-140. Sind.

24. Brassica.

B. nigra, *XToeh.,* F.B.I.—1-156. *Molari.* Cultivated.
B. campestris,Ziifif.fF.B.i.-I.156. Swedish Turnip. Rarely cultivated,

B. campestris *Napus.*, T.B.I.—1-156. *Shalgam,* Turnip. Cultivated in gardens.
B. „ *Rapus.*, F.B.I.—1-156. *Sarson, pivli rai.* Cultivated in fields.
B. juncea, *H.f. Sf T.*, F.B.I.—1-157. *Mohari.* Cultivated.

26. JEruca.

B. sativa, *Lamk.*9 F.B.I.—1-158. *Safed Sursu.* Gardens as a weed.

27. Moricandia.

M. tortuosa, *Rook.,/. & T.*, F.B.I. -1-158. Sind.

28. Capsella.

0. Bursa-pastoris, *Mcench.*, F B.I.—1-159. Shepherd's Purse. Mahableshwar. January*

29. Lepidium.

L. sativum, *Linn.*, *.B.I.—1-159. *Miv.* Cress.

Senebiera.

S. didyma, *Pers.*, Hook., "Flor. Brit. Isles. 37. Garden weed, Ruk Junction, Sind. March.

32. *Thlaspi.*

T. arvense, *Linn.*, F.B.I.—1-162. Kritar Mts., Sind, March.

36. Dipterygium.

D. glaucum, *Decaisne,* E.B.I.—1-164. Jaoobabad, Sind. September.

40. Physorhyncus.

P. brahvicns, *Hook,* fil., r.B.i.—1-165. Bullo Khan, Sind. Angust.

4.1. Raphanus.

R. sativus, *Linn.*, "F.B.I.—1-166. *Mula,* Radish. Cultivated. October—January.
R. sativus caudatus. *Mougri.* Cultivated.

XI.—Capparidæ.

i. *Cleome.*

C. monophylla, *Linn.*, P.B.I. —1-168. Bodeli, Guzerat, Gokak, Badami, Dharwar. November.
C. papillosa, *Steud.*, F.B.I.—1-168. Thano Balo Khan Road, 34 milea from Karachi. August.
C. quinquenervia, 7>C, T.B.I.—1-168. Laki, Sind. October.
C. Stocksiana, *Boiss.*, r.B.I.—1-169. Laki, Sind. October.
C. simplioifolia, *B.f. $ T.*, F.B.I.—1-169. Poona, July.
C. brachycarpa, *Vahl,* F.B.I.—1-169. Karachi. December—May.
C. aspera, *Koenig.*, F.B.I.—1-169. Badami, Dharwar. August.
C. Bunnanni, *W. Sf A.*, F. B. I.—1-170. Hyderabad, Sind, *W. Strachan.*
C. viscosa, *Linn.*, F.B.I.—L-170. *Pivli tilwan, kdnphicti.* Deccan, widely. September—June.
C. Chelidonii, *Linn.*, F.B.I.,—1-170. Khadkalla, Dang. July—February.

2. *Gynandropsis.*

G. pentaphylla, *DC.*% F.B.I.—1-171. *Pandhri-tilwcm.* Deecan, Guzerat. Cold season.

4. *Moerua.*

M. arenaria, JT./. *$ T.*, F.B.I.—1-171. Yoat, Poona Dist. November—March.

5. *Cratava.*

C. religiosa, *Forst.*, F.B.I.—1-172. *M&dvarnd, Vayavarud.* Hoolicul, Kanara. March.

6. *Cadaba.*

C. indica, *Lamk.*, F.B.I.—1-172. Surat, Bijapur. November—December.

7. *Capparis.*

C. spinosa, *Linn.** F.B.I.—1-173. Edible eaper. *Kabar, Kalvari.* Mahableshwar, Khirtar Mts., Sind. January—March.
C. zeylanica, *Linn.*, F.B.I.—1-174. *Wag&ti, Govindphal.* Alandi, Poona, Dharwar. March—April.
C. Heyneana, *Wall.*, F.B.I.—1-74. Divimana, N. Kanara. May,
C. divaricata, *Lamk.*, F.B.I.—1-174. Dharwar, Rftjewadi, Alandi, S. M. Ry. February—April.
C. a"-hylla, *Roth.*, F.B.I,—1-175. *Nepti.* Deccan, Sind, widely. November—March.
C. Moonii, *Wight, 3B.1.*—1-175. *Wdghdti.* W. Gbats, widely. December.
C. Roxburghii, *DC,* F.B.I.— 1-175. *Wdghdti.* Believed to be synonymous with C. Moonii.
C. grapiis, *Linn.*, F.B.X.—1-176. *Pdchundd.* Buleshwar, 30 miles E. of Poona. Bankepur, Dbarwar, hot season. April.

C. pedunculosa, *Wall.*, F.B.I.—1-176. *Kolisna.* Konkan, *Stocks.*
C. longispiua, *H.f. $* 21, F.B.I.—1-176. Mahableshwar.
C. sepiaria, *Linn.*, P.B.I.—1-176. *Kanthar.* Deccan, widely. Maroh.
C. horrida, *Linn.*, F.B.I—1-177. *Kirur, Wdghâti, Govindi.* Decoan, Sind, S. Maratha country. December—Februar j_m
C. tenera, *Dais.*, P.B.I.—1-179. Kumta, Sirsi JKoad. March.

XII.—Resedaceæ.

1. *Reseda.*

R. pruinosa, *Delile,* F.B.I.—1-181. Bolo Khan, Sind. March.

2. *Oligomeris.*

O. glaucescens, *Cam.*, F.B.I.—1-181. Khirtar Mts., Siad. March.

3. *Ochradenus.*

0. baccatus, *Del** F.B.I.—1-182. Hyderabad, Sind, Karachi.

XIII.—VlOLABIEJE.

1. *Viola.*

V. cinerea, *Boist.*, F.B.I,—1-185. *Banafsha.* Thorala, Rajkot *C. Mac Nag ht en.* Tata, Sind. July—August.

2. *lonidium.*

1. suffruticosum, *Ging.*, F.B.I.—-1-186. *Batan purus.* Broach, Badami, Dharwar. October.

XIV.—Bixnnsjs.

Cochlospermum.

C. Gossypium, D C , F.B.I.—1-190. *Kathlyagond.* Poona. February.

2. *Scolopia**

S. crenata, *Clos.*, F.B.I.—1-191. W. Ghats, S. of Ramghat. *DalzelL*

3.* *Bixa.*

B. Orellana, *Linn.*, F.B.I.—1-190. *Kesri, Shendru'* Arnatto tree, widely planted. September,

4. *Flacourtia.*

F. montana, *Graham,* F.B.I.—1-190. *Attah** W. Ghats, Ankola. November—December.
F. Ramontohi, *L'Herit.*, F.B.I.—1-193. *Tabat.* W. Ghats, widely. May—September.
F. sepiaria, *Roxb.*, F.B.I.—1-194. *Tambat Atrun.* W. Ghats, widely. April.

9. *Sydnocarpus.*

H. Wighfcianus, *Blume.*, F.B.I.—1-196. *Kadu Kavath.* W. GhAts, widely. January—April.

XV.—PlTTOBPOBEa:.

1. *JPittosporum.*

P. floribundum, *W.* ^-4., F.B.I.—1-199. K^rfrf*. Mahableshwar. July.
P. dasycaulon, *Miguel,* F.B.I.—1-199. Yacombi, N. Kanara. January.

XVT.—Polygaleæ.

1. *Polygala.*

P. abyssinica, *Fresen.*, F.B.I.—1-102. Sind. December.
P. persicariafolia, Z>C, F.B.I.-I-202. Hills near Poona. August—September.
P. erioptera, *DC,* F.B.I.—1-203. Nasik, Ankleswar, Broach. August.
P. elongata, *Klein.*, F.B.I.—1-203. Savantwadi, Badami. August—November.
P. chinensis, *Linn.*, F.B.I.—1-204. *Phutani.* Poona, Dharwar. October—March.

XVIII.—CABYOPHTLLEJS.

5. *Saponaria.*

B. Vacoaria, *Linn.*, F.B.I.—1-217. *Sabni.* Nasik, Poona, Mahableahwar. February.

6. *Silene.*

S. noctiBora, *linn.*, F.B.I.—Poona, weed in gardens. December-January.

10. *Cerastium.*

C. indicum, *W. &f A.*, F.B.I.—1-227. Purandhur. September.

11. *Stellaria.*

S. media, *Linn.** F.B.I.—1-230. Mabablesbwar. December.

13. *Arenaria.*

A. neelgberrensis, *W. $ A.,* F.B.I.—1-239. Yacombi, N. Kanara. February.

16. *Spergula.*

S. arvensis, *Linn.,* F.B.T.—1-243. Khirtar Mts., Sind.

18. *Poly carport.*

P. LoeflingifiB, *Benth, Sf Hbok.,f.9* F.B.I.—1-245. Mabableshwar, Lanowli. April— June.

19. *Polycarpoea.*

P. corymbosa, *LamJc.,* F.B.I.—1-245. Badami, Dharwar, Poona. November—January.
P. diffusa, *W. 8f A.*, F.B.I.—1-245. Badami. September.
P. spicata, TF. <$ *A.*, F.B.I.—1-246. Porebaudar, Mangrol, Tata, Sind. November—February.

XIX.—PoBTULACBS.

1. *JPortulaca.*

P. oleracea, *Linn.*, F.B.I.—1-246. *Ghol.* Deccan, Guzerat, Sind. Ootober— December.
P. Wigbtiana, *Wall.%* F.B.I.—1-247. Londa, Belganm. October—November.
P. quadrifida, *Linn.*, F.B.I.—1-247. *Bang hoi, Bay a ghol.* Badami, Dbarwar. November.
P. tuberosa, *Boxb.*, F.B.I.—1-247. *Jtmglee gajar.* Mulier river, Karachi. August.
P. suffruticosa, *Wight,* F.B.I.—1-247. Abmedabad. November.

2. *Talinum.*

T, cuneifolium, *Willd.,9* F.B.I,—1-247. Singbur, Purandhur, Poona Diet. November.

XX.—TAMABISCINBJE.

1. *Tamarix.*

T. gallica, *Linn.*, F.B.I.—I,248. *Jhavrajhad.* Sind. December.
T. dioica, *Boxb.*, F.B.I.—1-249. *Jhau.* Broacb, Sind. November.
T. ericoides, *Bottl.*, F.B.I.—1-249. *Khadsherni.* Poona, Broach. Gulgeri. November.

XXI.—ELATINAE.

2. *Bergia.*

B. odorata, *Edgew.i* F.B.I.—1-251. Sibi, Sind, Dahoi, Porbnnder. October—November.
B. ffistivosa, TF. ^ *A.,* F.B.I.—1-251. Rajkot, C. *MacNaghten.* Poona.
B. ammannioides, *Boxb.*, F.B.I.—1-251. Poona, Karachi, Bhubak, Sind. November—December.
B. vertioillata, *Willd.*, F.B.I.—1-252. Dasgaon, Konkan. October.

XXIII—GUTTIFBBiE.

1. *Qarcinia**

C. indioa, *Chois.** F.B.I.—1-261. *Koham ratamba.* Ambeghat, Matheran. January.
G. Morella, *Dess.*, F.B.I. —1-264. *Arsinagurgi, Nardala.* Siddapur, N. Kanara. November.
G. XanthochymuB, *H.-f.*, F.B.I.—1-269. *Ont, Jharambi.* W. Ghats, widely. MaTch.
G. ovalifolius, JBT.-/-, F.B.I.—1-269. *Haldi, Tavir.* Matheran, W. Ghats, in fruit. March.

2. *Ochrocarpus.*

C. longifoliua, 2?. $• JET, F.B.I.—1-270. *Surangi,* Khandalla, Kudgal, N. Kanara. February—March.

3. *Calophyllum**

C. inophyilum, *Linn.*, F.B.I.—1-273. *TJnau* Ratnagiri, Kumta. Janpary.
C. Wightianum, *Wall.** F.B.I.—1-274. *Bobbi, Iraii* Yellapur, *TaJLbot,* in fruit. March.

5. *Mesua.*

M. ferrea, *Linn,,* F.B.I.—1-277. *Nag-chappa** Konkan. November—January.

XXV.—DlFTBBOCABFBJS.

2. *Ancistrocladus.*

A/ Heyneaftus, *Wall.*, F.B.I.—1-299. *Kardor Kurdirt.* Divimana, W. Ghats, Thana District January—March.

5. *Shorea.*

S. Talura, *Boxb.*, F.B.I.—1*304. Sirsi, Siddapur, N. Kanara. February—April.

6. *Hopea.*

H. Wightiana, *Wall.*, F.B.I.—1-309. *Haiga Kavsi.* Londa, Castle Rook, W. Ghats. June,

8. *Vateria

V. indica, *Linn.*, F.B.I.—1-313. *Dhnpada.* Siddapur and Sirsi Districts. February—April.

XXVI.—MALVACBJE.

1* *Althoea.*

A. Ludwigii, *Linn.*, F.B I.—I-319. Karli, Poona, Hyderabad, *Schwan*, Sind. March - July.
A. rosea, *Linn.*, F.B.I.—1-319. *Hollyhock.* In gardens. January—March.

3. *Malva.*

M. rotundifolia, Z m , F.B I.—1-320. *Khaparkhuti.* Deccan, widely. September—January.
M. parviflora, *Linn.*, F.B.I—1-321. *Narr, Oogi Sag.* Magarpir, Sind. March.

4. *Sida.*

S. humilis, *Willd.*, F.B.I.—1-322. Guzerat, Sind, widely. October—November.
S. mysorensis, *W m Sf A.*, F.B.I.—1-322. Deccan, widely. November—January.
S. spinosa, *Linn.*, F.B.I.—1-323. Deccan, Guzerat. November.
S. grewioides, *Guill. $ Perr.*, F.B.I.—1-323. Karachi. December.
S. carpinifolia, *Linn.*, F.B.I.—1-323. *Chikna.* Poona, Marmagoa. December.
S. rhombifolia, *Linn.*, F.B.I.—1-323. *Bala, Jungli Methi.* Poona, Belgaum. October__December.
S. cordifolia. *Linn.*, F.B.I.—1-324. Gokftk, Belgaum, Badami, Dharwar. October—November.

5. *Abutilon.*

A. polyandnim, *Schl.*, F.B.I.—1-325. W. Ghats, widely. November—January.
A. Banadei, *Woodrow and Stapf., Kew Bull 1894, fol. 99. Ambeghat, W. Ghats. December—March.**
A. indicum, *G. Don.*, F.B.I.—1-326. *Mudra.* Deccan, widely.
A. graveolens, *W. Sf A, F.B.I.—1-327. *Barkanghi.* Shewan, Sind. March.**
A. muticum, *G. Don.*, F.B.I.—1-327. Deccan, widely. January—July.
A. crftpum, *G. Don.*, F.B.I.—1-327. Badami, Dharwar. November.
A. ramosum, *Guill. and Perr.*, F.B.I.—1-328. Ahmedabad, Karachi. December.
A. fruticcsnm, *Guill. and Perr.*, F.B.I.—1-328. *Pat til.* Banks of Mulier, Karachi, August__September.

5.* *Malachra.*

M. capitata, *Linn.*, F.B.I.—'1-329. *Rant>hendi.* Bombay, abundant. November—January.

6. *Vrena.*

***V.* lobata, *Linn.*, F.B.I.—1-329. *Vanahhend.* Kalyan, Belgaum. October—December.**
U. ———var. scabriusoula, D C , Belgaum. December.
U. sinuata, *Linn.*, F.B.I.—1-329. Londa. October—November.

7. *Pavonia.*

P. glechomifolia, *JL Bich.*, F.B.I.—1-330. Kathiawad, Sind.
P. arabica, *Mochst.*, F.B.I.—1-331. Sind.
P. zeylanica, *Cav.*, F.B.I.—1-331. Ahmendnapr, Broach, Sind. November.
P. oeratocarpa, *Dalz.*, F.B.I.—1-331. Karachi. December.

8. *Decasvhistia.*

D. trilobate, *Wight*, F.B.I.—1-332. Amboli, Castle Rock, W. Ghats. November.

11. *Senra.*

S. incana, *Cav.*, F.B.I.—1-333. Karachi. December.

12. *Hibiscus.*

H. Trionum, *Linn.*, F.B.I.—1-334. Deocan, Sind, widely. February.
H. surattensis, *Linn.*, F.B.I.-I-334. *Ban bhendi.* Knmta. November-December.
H. furcatus, *Boxb.*, F.B.I.-I-S?5. Castle Rock, W. ^hats. October-February.
H radiatus, *Willd., V.B.I.*—1-335. Junnar (Poona District), Dhulia. September-October.
H hirtus, *Linn.*, F.B.I.—1-333. *Dupari.* Matheran, Khandalla, Poona. August—February.
H. micranthus, *Linn.*, F.B.I.—1-335. Poona, Guzerat, Sind, widely. October.
H. scindicus, *Stocks.*, F.B.L-I-336. Sind, *Stocks*, (specimens wanted.)
H intermedium *A. Bich.*, F.B.I.-I-336. Sind, *Stocks.* Kathiawad, *Dalz.*, (specimens wanted.)
H. Solandra, *L. Herr.*, F.B.I.-I-336. Guzerat, Dharwad. November.
H. collinus, *Boxb.*, F.B.I.—1-338. Gardens.

ii. pandurseformis, *Burm.*, F.B.I.—1-338. Chinohwad, Poona District. October.
H. vitifolius, *Linn.*, F.B.I.—1-338. *Vankapas.* Bahuli, Poona District, Revadanda. October—December-
H. cannabinus, *Linn.*, F.B.I.—1-339. *Ambadi.* Cultivated widely.
H. Gibsoni, *Stocks*, F.B.I.—1-339. Deccan, Concan. Sind, *Stocks.*, not found.
H. punctatus, *Dalz.*, F.B.I.—1-340. Karachi. August—Desember.
H. Sabdariffa, *Linn.*, F.B.I.—1-340. *Lai ambadi.* Cultivated widely. October—December.
H. ficulneus, *Linn.*, F.B.I.—1-340. ^
H. Manihot, *Linn.*, F.B.I.—1-341. In gardens.
H. tetraphyllus, *Roxb.*, F.B.I.—1-341. *Jungli bhendi.* Amboli, Jambulpada. October.
H. angulosus, *Mast.*, F.B.I.—1-341. Concan.
H- Abelmoschus, *Linn.*, F.B.I.—1-342. *Kasturi bhendi.* In gardens.
H. tiliaceus, *Linn.*, F.B.I.—1-343. Planted.
H. esculentus, *Linn.*, F.B.I.— 1-343. *Bhajichi bhendi.* Gardens.
H. rosa-sinensis, *Linn.*, F.B.I.—1-344. *Jasundi.* Gardens.
H. mutabilis, *Linn.*, F.B.I.—1-34.4. Gardens.
H. syriacus, *Linn.*, F.B.I.— 1-344. „
H. schizopetalus. Gardens.

13. *Thespesia.*

T. Lampas, *Dalz. fy* Gift*., F.B.I.—1-345. *Ban bhendi.* W. Ghâts, widely. August—September.
T. populuea, *Corr.*, F.B I.—1-345. *Bhendi.* Shrivardhan. September.

14. *Gossypium.*

G. Stooksii, *Mast.*, F.B.I.—1-346. Wild cotton of Sind. Near Karachi. December.
G. arboreum, *Linn.*, F.B.I.—1-347. *Narma* or *Deokapas*, a tall fastigiate shrub with deeply-lobed leaves, purple flowers, lanceolate stipules and seeds covered with white wool over-Ijing green down. In gardens.
G. neglectum, *Tod,* Watt. Diet. IV.—7. *Deshi* at Ahmednagar, *Bengals* of commerce. Resembling G. arboreum in habit cf growth and form of leaf, but with yellow floweis with a purple centre. Evidently a hybrid or selection from G. arboTeum.
G. religiosum, *Roxb.* • A vigorous diffuse shrub, thriviug in moist sandy soil ; stipules cordate acuminate ; flowers, yellow, large ; down adherent to seeds; wool white or tawny.
G. braziliense, *Macf.* . Pernambuco or Brazilian cotton ; resembling *G. religiotum,* but with coherent seeds.
G. Wightianum... . Hinginghat cotton.
G. sp., wild, Badami, Dbarwar—A climber in hedges on sandy soil ; leaves 3—5 fid, pubesence stellate wide sinuses between the lobes, variable, often with a blunt tooth ; stipule falcate ; bracts cordate, toothed.

15. *Kydia**

K- calycina, *Roxb.*, F.B.I.—1-348. Ghats. November.

15.* *Adansonia.*

A. digitata, *Linn.*, F.B.I.—1-343. *Gctrakhchinch,* widely planted, Caranja ; naturalised.

16. *Bombax.*

B. malabaricum, DC, F.B.I.—1-349. *Savar,* Katesavar, Deccan, Konkan, widely. MaTch—April.
B. insigne, *Wall.*, F.B.I.—1-349. N. Kanara. March—April.

17. JSriodendr on.

B. anfractuosum, *DC,* F.B.I.—1-350. *Pandhrisavar.* .Mawal, Poona District. January.

XXVII.—STEECULIACE-E.

Sterculia.

S. fcetida, *Linn.,* F.B.I.—1-354. *Devdar.* Konkao, planted. March—April.
S. urens, *Roxb.*, F.B.I.—1-355. *Saldhol, Candol.* W. Ghâts, Konkan, widely. December.
S. villosa, *Roxb.*, *.B.I.—1-355. *Cowicha.* Gadhv', Dan?. February.
S guttata, *Roxb* , F.B I —1-335. *Kuhar% Qoldar.* W. Ghâts, widely. February.
S. colorata, *Roxb.*, F.B.I.—1-359. *Khaushi.* W Ghâts. March—April.
S. alat:«, *Roxb.*, F B.I.—1-360. Burboli Ghat, N. Kanara, recently widely planted, Poona, Khandalla.
S. populifolia, *Roxb.*, F.B.I.—1-361. Hewra, planted.
S. campanulata, *Wall.*, F.B.I.—1-362. Follicles membranaceous 1-seeded, dorsally winged, planted. Khandalla Hotel. March.

5. *Eleinhovia.*

K. Hospita, *Linn.*, F.B.I.—1-364. Planted.

f.

6. Helicteres.

H. isora, *Linn.*, F.B.r.—1-365. *Eewan, Murudsheng.* Guzerat, Deccan, Konkan, widely. July—November.

7. Pterospermum.

P. suberifolium, *Lam.*, F.B.I.—1-867. *Muchkund.* N. Kanara. Poona, planted. December.
P. aoerifolium, *Willd.*, F.B.I.—1-368. *Kanakchapha.* Deviman Ghat: widely plaated, Deoember—February.
P. reticulatum, *W. and A*,, F.B I.—1-369. Poona, planted : W. Ghats, southward.
P. Heyneanum, *Wall.*, F.B.I.—1-369. Dharwad, *Dalz.*

8. Eriolcena.

E. Stocksii, *Hook*f.*, F.B IJ^-I-370. Konkan, *Stocks*, (specimens wanted.)
E. Candollei, *Wall.*, F.B I.—1-370. *Bothi, Hadang.* Konkan, *Dalz.;* deciduous forests, N. Kanara, *Talbot.*
E. quinquelocularis, *Wig/it.*, F.B.I.—1-371. *Bud/aridhaman.*

9. Pentapetes.

P. phaenicea, *Linn.*, F.B i.—T-371. *Tambdidupari.* Birchy, N. Kanara, Sehwan, Sinj, in gardens. August—November.

10. Melhania.

M. incana, *Heyne*, F.B.I.—1-372. Badami. November.
M. tomentosa, *Stocks*, F.B.I.—1-373. Sind.
M. Deuhami, *Br.*, F.B I.—1-373. Hills near Karachi. December.

11. Hfelochia.

M. corchorifolia, *Linn.*, F.B.I.—1-374. Near Godhra, Bombay, September—November.
M. velntina, *Bedd.*, F.B.I.—1-374. Poona, planted. November.

12. Waltheria.

W. iodica, *Linn* , F.B.I.—1-374. Badami, Dharwad. August.

13. Ahroma.

A. augusta, *Linn.*, F.B.I.— 1-375. *Ulat'kambal.* Widely, in gardens. Januai^.

14. G-uazwma.

G. tomentosa, *Kunth.*, F.B I.—1-375. *Rudrakshi.* Planted widely. March—August.

XXVIII.—TILIACEJS.

6, Grewia.

G. columnaris, *Sm.*, F.B.I.—1-383. Santaveri, *Talhot,* in fruit. December.
G. oriental is, *Linn., -E.B.I.*—1-384. Western India, *De Crespigny.*
G. heterotricha, *Mast.** F.B.I.—1-385. Nilkand, N. Kanara, *Talbot.* November.
G. populifolia, *Vahl*, F B.I.—1-385. *Gango, Gangi* (Sind). Badami, Dharwad, Sind. August—October.
G. salvifolia, *Heyne*, F.B.I.—1-386. *Bihul* (Sind). Badami. June—August.
G. tilisofolia, *Vahl.*, F.B.I. — 1-386. *Dhaman* Bhimashankar, Hills near Poona. May—August.
G. asiatica, *Linn.*% F.B.I.—1-386. *PTtalsa.* Cultivated widely.
G. carpinif olia, *Juss* , F.B.I.—1-387. Londa, Dharward. October.
G. pilosa, *Lam.*, F.B.I.—1-388. tadami. August.
G. villosa, *Willd.*, F.B.I.—1-388. Porebunder, in fruit. October.
G. laevigata, *Vahl.*, F.B.I.— I.-389. Karwar, Halyal, *Talbot.* August—October.
G. Ritchiei, *Mast..*, F.B.I.—1-389. Konkan, *Stocks*, W. Ghats, *Ritchie.*
G. abutilifolia, *Juss.*, F.B.I.—1-390.
G. hirsuta, *Vahl.*, F.B.I.— 1-391. Bowdhan, near Poona. August—September.
G. poljgama, *Roxb.*, F B.I.—1-391. Matheran, Amboli, "W. Ghats. October—December.
G. microcos, *L.*, F.B.I.—1-392. Castle Hock, W. Ghats. November.

APPENDIX II.

Ilora of a hill on the western verge of the Deccan.

The hill referred to is about 15 miles south-east of Poona. Near its base is Alundi station on the Southern Mahratta Railway, and on its highest point is the fort known as Mulhargud, which has wells and water-tanks yielding water near the surface as is common on other hills near the Western Ghàts. A bench mark on a ridge 20^—300 feet lower than the fort is mark ed on the survey map; altitude 8,220 feet.

The hill consists chiefly of traprock in variable condition, on the surface iu the disintegrated form known as *moorum* with a scanty covering of soil; and at intervals beds of calcareous marl* which, by the sides of water-courses, present moist vertical surfaces covered with a small form of Adiantum Capillus-Veneris, *Linn.* The vegetation, although varied, is not luxuriant, and no large trees occur.

JZanunculacece.

Clematis triloba, *Heyne.*

Menispermacece.

Tinospora cordifolia, *Miers.*
Cocculus villosus, *D C.*
Cissampelos Pareira, *Linn.*

Crucifera.

Cardamine subumbdllata, *Rook.fiL*

Capparidece.

Cleome siuiplioifolia, *H. f. and T.*
Gynandropsis pentapbylla, *D C.*
Capparis divaricata, *Lamh.*
Capparis grandis, *Linn, f,*

Bixinece.

Flacourtia Ramontohi, *L. Herit.*

Polygalece.

Polygala erioptera, *D C.*

Caryophyllea.

Polycarpsea corymboaa, *Lamk.*

Elatinece.

Bergia ammaunioides, *Roxb.*

Malvacea.

Malva rotundifolia, *Z.*
Abntilon muticum, *G-. Bon.*
Pavonia zeylanica, *Cav.*
Hibiscus radiatus, *Willd.*
H. micrantbus, *Linn.*
H. oanuabious, *L.*

TUiacece.

Grewia birsuta, *Vahl.*
Corchorus trilocularis, *L.*

ZygophylletB.

Tribulus terrestris, *Linn.*
Fagonia arabica, *Linn.*

Geraniacece.

Oxalis corniculata, *Linn.*

Butacea.

Murraya Kcenigii, *Spreng.*

Simarubece.

A'Oantbus exoelsa, *Ro&b.*
Balanites Roiburgbii, *Planch.*

Burseracea.

JLtanrelHa serrata, *Roxb.*

Meliacea.

Melia Azadiraohta, *Linn,*

Celastrinea.

Gymnosporia montana, *Roxb.*
ISlaode*.

Rhamnea.

Zizypbus Jujuba, *Lamk.*
Z. /ylopyrus, *Willd.*

Ampelidea.

Vitis repanda, TT. *<f- A.*
V. setofla, *Wall.*

Sapindacece.

Cardiospermum Halicacabum, *Linn.*
Sapindus trifoliatus, *Linn.*

Anacardiacea,

Rhns parviflora, *Roxb.*

LeguminostB.

Crotalaria orixensis, *JRottl.*
Indig-ofera linifolia, *JSeiz.*
I. cordifolia, *Heyne**
I. trita, *Linn JU.*
I. argentea, *Linn.*
I. tinctoria, *Linn.*
Tepbrosia purpurea, *JPers.*
Taverniera nummularia, *D C.*
Alysicarpus bupleurifolius, *D C.*
A. tetra^onolobus, *Edgw.*
Abrus precatoriue, *Linn.*
Oanavalia ensiformis, *D C.*
FhuBeolu8 aconitifolius, *Jacq.*
Rhynohonia minima, *Z> C.*
Dalbergia lanceolaria, *Linn.*
Poinoiana elat»9 *Linn.*
Cassia Fistula, *Linn.*
C. occidentalis, *Linn.*
C. anriculatn, *Linn.*
***C.* obovata,** *Collad.*
C. Absus, *Linn.*
Tainarindus iudica, *Linn.*
Bauhinia r.-icetnosa, *Lam.*
Mimosa hamata, *Willd.*
Prosopis epioi^era, *Linn.*
Acacia lencophlsea, *Willd.*
A. Suma, *Kurz.*
A. Catechu, *Willd.*
A. Latronum, *Willd.*
Albizzia od^ratissima, *Benth.*
A. amara, *Boivin.*

Comb ret ace ce.

Anogeissus latifolia, *Wall.*

Lythracets.

Woodfordia floribuuda, *Salisb.*

Cucurbitacea.

Moroordioa dioica, *JRoxb**
Cucumis tr gonufl, *Roxb.*
Citrullus Colocyntbis, *Sohrad.*
Mukia scabrella, *Am**
Corallocarp us ©pig»a, *Hook. f.*

Umbelliferce.

Pimpinella Candolleana, *W. <$• A.*

Rubiacecc.

Oldenlandla aspera, *D C.*
MoTinda citrifolia. *Linn,*
Hamiltonia suaveolens, *IZoxb.*
Spermacoce bjspida, *Linn.*

Composite.

"Vernoma antbelmintica, *Willd.*
Gnaphalium luteo-album, *Linn.*
Pulioaria Wightiana, *Clarke.*
Eclipta alba, *Hassle.*
Glossocardia linearifolia, *Cass.*
Flaveria contrayerba*
Notonia grandiflora, *D C.*
Senecio bewrensis, *Hook. f.*
S. Edgewoxthii, *HJc.f.*
Goniocaulon glabrum, *Oass.*
Tricholepis radicans, *Z> C.*
Pico ilia tocaentosa, *Oass.*
Iiannea pinnatifida, *Cass.*
Sonchus oleraoeus, *Linn.*

JPlumbaginetM.

Plumbago zejlanica, *Linn.*

JSbenacea.

Diospyros Tupru, *Buck-Ham.*

Oleaeeet.

Sohrebera swietenioides, *Moxb.*

Saluadoracecc.

Salvadora persica, *Linn.*

Apocynacece.

Carissa Carandas, *Linn.*
Yinca pusilla, *Murr.*

Asclepiadea.

Hemidesmns indicus, 2?r.
Crjptolepis Buchanani, *Ream $ Sch.*
Calotropis gigantea, *Br.*
Pentatropis microphylla, *Wight and Am.*
Dsemia extensa, *Br.*
Sarcosteinma brevistigma, *Wight and Am.*
Dregea volubilis, *Benth.*
Leptadenia reticulata, *Wight and Am.*
Caralluma fimbriata, *Wall.*

G-entianace.*

Canscora diffusa, *Br.*

Boraginece.

Ehretia l»vis, *JRoxb.*

Convolvnlaeecs,

Bivea hypocrateriformis, *Chois.*
Argyreia cuneata, *Ker.*
Ipomsea eriocarpa, *Br.*
Convolvulua fiotderianu^, *Chois,*

Sviamacem.

Solanu*. xnnthocarpum, *Schrad.*
Physalis minima, *Linn*.*
Withania somnifera, *Dunal.*

Scrophula rinece.

Oolsia ooTomandeifana, *Vahl.*
Herpestes Monniera, &. *B. ◁' SI,*
Sopubia delphinifolia, *G-* Don.*

Aeanthaeea.

Calophanes Dalzellii, *T. Anders.*
Rnellia patula, *Jacq.*
Blepharis molluginifolia, *Pe^rs**
Iiepidagathis cristata, *Willd.*
Justicia diffusa, *Willd.*
Bangia elegans, *Dalz.*

*Verbenacete**

Iiantana indica, *Roxb.*
Lippia nodi flora, *Rich.*
Clerodendron phlomoides, *Linnf.*

Labiata.

Ooimum sanctum, *Linn.*
Plectrantbus in can UP, *Link.*
Coleus barbatus, *Benth.*
Leucas longifolia, *Benth.*

Nyctagiitec.*

Boerhaavia repens, *Linn.*
Boerhaavia vertioillata, *Poir.*

Amarauiace<z.

Celosia argentea, *Linn**
Digeia arvensis, *Forsk**
Amarantus tenuifolias, *Willd.*
Fupalia lappacea, *Mog.*
jErua Janata, *Juss.*
Acbyranthos aspera, *Linn**

A ristolochiacece.

Aristolochia bracteata, *Retz.*

Santaloc<*.*

Osyris arborea, *Wall**

JSuphorbiaceat.

Euphorbia coccinea, *Roth.*
E. bypericifolia, *Linn.*
E. thymifolia, *Burm**
E. neriifolia, *Linn.*
Flueggia leucopyrus, *Willd,*
Jatropba Cureas, *Linn.*
Tragia involucrata. *Linn**
Yar can u a bin a.

Vrtieacea.

Ficus religiosa, *Linn.*
F. glomerata, *Roxb**

Orchidece.

Habenaria digitata, *Lindl.*

Liltract a.

Chlorophytum laxum* *Br.*
Dipcadi montanum, *Baker.*
Soilla indica, *Baker.*
Iphigenia indica, *Kunth.*

Commtlinact.*

Cyanotis tuberosa, *Schultes.*
C- fasciculata, *Schultes.*
C. axillaris, *Rcem. $ Sch.*

Eriocaulem.

Xriocanlon sp.

Cyper ace at.

Pycreus nitons, *Nees.*
P. oapillaris, *Nees.*
Juncellus alopecuroides, *C. B* Clarke**
Cyperns difformis, *Linn.*
C. digitatns, *Jtoxb.*
Fimbristylis diphylla, *Vahl.*
F. quinquangularis, *Kunth.*
Scirpns snpinus, *Linn.*
Fairena pnbescens, *J£unth.*

GrraminecB.

Panicum pnnctatum, *Burnt.*
P. prostratnm, *LamJc.*
P. miliare *Lamk.*
Setaria glauca, *JBeauv.*
Arthraxon lanceolatus, *ITochst**
Manisurus granularis, *Linn.*
Thelepogon elegans, *Hoth.*
Isehsemum laxum, *Br.*
Andropogon foveolatus, *Del.*
A. peTtnsus, *Willd.*
A« triticeus, *Br.*
Aplada varia, *Sack.*
Aristida funiculata, *Trin.*
var. Royleana.
Chloris tenella, *Hoxb.*
Graoilea nutans, *Koen.*
EriocanlesB, CyperaoeaB and Graminem.
I hope to complete during the present season t —

Filices.

Adiantnm Capiilus-Veneris, *Linn.*
A. Edgeworthii.
Athyrium. filix-femina,$_a$ *Bernh.*
Actiniopteris diohotoma, *Forsk.*

G. MARSHALL WOODROW.

APPENDIX III.

PLANTS OF A BOMBAY SWAMP.

BY G. MARSHALL WOODROW,

(Bead before the Bombay Natural History Society on 18th March 1897.)

The land from which the plants referred to were gathered is nearly enclosed by three lines—Clerk Road, the Vellard, and the " Main Drain." Its altitude is nearly mean sea-level and the greater part of it is said to be under water during the monsoon months. The soil when dry is a sandy loam heavily charged with salt.

Vegetation is confined to a bank a few inches higher than the general level ; it is chiefly herbaceous, such woody plants as occur are under one year old, except *Tamarix,* which thrives on land submerged a portion of the year.

The species found are 79 in number, bat it is very probable that further search may greatly increase the flora. The collection referred to here was made in November and Decem - ber. No *Cryptogams* were found, and it is probable that a search made during September would reveal many.

In reviewing the plants in their order, according to the natural system, it is found that—

CAPPARIDE^; are represented by *Gynandropsis pentaphylla,* DC, [a] Til wan/*

PoRTULACOEiE by *Portulaca oleracea,* Linn., the "" Ghol" of the Marathas, and Purslane of the English. Formerly much valued in salads and pickles. It has fallen out of use in Great Britain and in this country, and appears to be little valued by the well-to-do classes, as it is seldom seen in the bazaars.

CARYOPHYLLE-2E by an elegant *Stellaria,* of which the specimen has been lost.

TAMARISCINB-SJ by a species of *Tamarix* not in flower.

MALVACE-E by seedlings of the Portia tree, *Tkespesia populnea,* Corr.; the *• Bendi acba-jbar," a well-known littoral plant; a species of cotton *(Goisypium Wightianum,* Tod.); and *Malachra capitata,* Linn., a plant of tropical Africa a nd America which has spread all over the neighbourhood of Bombay. It yields a good fibre, and by some has been thought worth cultivating, but with " Sunn '* and [tc] Ambaree " to compete with, it does not get a front place.

BnTACEiE by *Teganum Harmala,* Linn., " Ispanda, harmala," a» herb peculiar to salt-soils and having a strong odour resembling Rue, and credited with medicinal virtues, rather too wide to be deep.

AMPELIDEJS by *Vitis carnosa,* Wall., " Ambat-vel," a common climbing plant in the Concan; the succulent trifoliolate leaves, when tasted, have at first a pleasant acid, which, however, soon becomes violently acrid. It is described as a domestic application to boils in the " Pharmacographia Indica."

LEGUMINOS2E by *Alysiearpus rugosus,* DC, and *Erythrina indica,* Linn., " Pângârâ." The solitary plant of the latter species is on the side of the Vellard and somewhat out of the reach of water. It has more the appearance of a truly wild tree than other examples near Bombay have—still it can scarcely be said to be indigenous to the district.

LYTHRACE.33 by *Amvnania baccifera,* Linn., and by numerous vigorous seedlings of *Lawsonia alba,* Lamk., " Mendi" or "Hinna'\ Those seedlings indicate the class of soil adapted for this plant, should the vagaries of fashion again call for its production as a commercial product.

ONAGRACEJE by *Zndwigia parvijlora,* Roxb., which is found on the muddy banks of tanks throughout the country.

PASSIFLORACE^J by *Carica papaya,* Linn., " Papay'" in numerous healthy seedlings.

CucuRBiTEAaE by *Zuffa echinata,* Roxb.; and by another plant so far spent as to be difficult to determine, but which is probably *Citrullus fistHosus,* Stocks, a bitter form of the water-melon.

EICOIDBJE by *Trianthema monogyna.* Linn., [u] Vishkapra; " and two widespread spacies of *Mollugo*—i/. *Airta,* Thunb., and *M. spergula,* Linn., [t€] Jharas."

UMBELLTFER^J by those useful plants FENNEL, *Fceniculum vnlgare,* Gsertn., " Bari shopha;" and *Carum copticum,* Benth., " Ajwan." The vigor of both species shows that they are indifferent to salt in the soil.

COMPOSITJE by the widespread weed *Vemonia cinerea,* Less., " Sahadevi;" used to promote perspiration. Also by *Ageratum conyzoides,* Linn., *Blumea membranacea,* DC, *B. amplectans,* DC, *Far. maritima,* and two more species of *Blumea* |hat are undetermined and which offer to any member of the Society, who k· expert in

the identification of plants of this genus, a nice opportunity for the exercise of a valued talent.

Eclipta alba, Hassk. [ef] Maka," a common weed whose variable medicinal virtues are recounted in the "Pharmacographia Indica;" *Spk&ranthm indicus,* Linn., "Mundi;" *Ccesnlia axillaris,* Roxb., had evidently dried up soon after the water went off. *Sonchus oleraceus.* Linn., the Sow Thistle.

BORAGINEJS by *Cordia Rothii,* Rcem. and Sch., " Gondani" and *Eeliolropium indicum,* Linn., a true halophyte, which was decidedly vigorous.

CONVOLVULACE-S: by a species of *Convolvulus,* of which only a single speciman was obtained. It appears different from any described in the flora of British India, and there is nothing like it in the herbarium at the College of Science, but one must not dogmatise from a single specimen with very few flowers available for dissection. *Cressa cretica,* Linn., " Khardi" " Rudantitka/' was frequent. This little herb affects salt and moist land so generally that by some people it is supposed to cause moisture. *Ipomaa sepiaria,* Koen, " Ambti," occurs on the higher portion by the side of the Vellard.

SOLANACE^ by *Phy sails minima,* Linn.; *Datura fastnosa,* Linn.; *Zycopersicum esculent um,* Miller (the " Tomatoe/'), *Sola me m nig rum,* Linn.; *8. melongena,~LS^^j* ("Benguin" or " Aubergine,") and *S. zanthocarpum,* Schrad. and Wend.
Those six species are all well-known plants which thrive on rich moist soil; they appear to be indifferent to salt in the soil.

ASCLEPIADS, APOCYNADS, and^GENTiANS would come in here, and their absence is remarkable.

SCEOPHULABINE.E by *Scoparia dulcis,* Linn,, a remarkable sporadic plant not hitherto recorded from the Bombay Presidency, but recently become abundant in Bengal; five specimens only were gathered after a long search; next year they will probably be abundant.

PEDALINE^ by *Sesamum indicum,* D.C., the " Til *[9] plant well developed, but dried up completely ; in soil similarly moist, but without salt, this plant would probably have retained some verdure till December.

ACANTHACE-E by *Peri&trophe bicalycnlata,* Nees ab E., and *LepidagalUis cristata,* Willd., « Talynkhana/'

VERBENACE^3 by *Lippia nodiflora,* Rich.; "Vakkan/[J] considered by Hindus to be a febrifuge and diuretic.

LABIATE by *Ocimum canum,* Sims., one of the species known as " Ran tulas/' was growing vigorously.

AMARANTACE^J by *Celosia argentea,* Moq., "[k]Kurdu". *Amaranths spinosus,* Linn., " Katemath."

A. viridit, Linn.

A. potygamus, Linn.

A. tenuifolius, Willd, " Tandoolja."

Nothosaerua brachiata, Wight.

Mrua I an at a, Juss., [tc] Kapur-madhur."

Alternanthera sessilis, B. Br., " Doodhsagar."

Achyranthes aspera, Linn., " Aghada," occurred on the higher portions.

CHENOPODIACEJE by *Suadafruticosa,* Forsk., one of the plants called " Morus," which are burned in the preparation of alkali. The variable colour of this and of many other plants which affect salt land is remarkable ; there may be found in proximity plants of the palett tjreen, and also plants of intermediate shades up to deep purple. *Brassica* is another salt-loving genus in which the pale green oE cauliflower and the dark purple of red cabbage may be seen.

EW?HORBIACE2E by *Euphorbia thymifolia,* Burm.; *E. hypericifolia,* Linn.; and the castor oil plant, *Ricinus communis,* Linn.

URTICACE2E by a solitary seedling of the Banyan tree, *Ficus bengalensis,* Linn., " Wad," which had germinated on the ground, a very rare condition for this tree. It is interesting to observe how Nature has provided tor the rotation of crops by requiring that the fruit of the Banyan, which falls to the ground, may rarely germinate, although it is well matured, as may be proved by sowing on crushed bxkks tfcpt moist. U i\te «eefa gwai™te& \m4er ttie parent tree a torest o£ weaUy plants would appear on a soil exhausted by produciug the parent.

CYPERACEÆ by *Cyperus rotundus; Mariscus mycrocephalus,* PresI; and *Scirpus maritiv mssy* Linn.

GRAMINEJE by *Paspalum distickum,* Linn., a littoral grass remarkable for its variability in babit under different conditions; the specimens exhibited would scarcely be believed to be the produce of the same species; one simple stem grows upright and bears long leaves and flowers ; another spreads on the ground, branches freely, and bears very short leaves. It is to this grass that the great beauty of newly-formed lawn in Bombay is due ; it has a deep green colour and a dense velvety growth, but as it grows in its native habitat in company with "Hariyali," the two species are mixed in making a lawn; and *Paspalum distichum,* Linn., either does not get enough salt or does not bear lawn treatment well. It grows well for a time, but soon abdicates *in* favour of the hardier " Hariyali." The lawn at the rear of the municipal building at first had a predominance of this grass, but now it has little else than iC Hariyali," which has a greyish green tint.

, The vernacular name of this grass has not been ascertained; it is easily distinguished from " Hariyali" by the infloresence having only two divergent branches, while the other grass has from one to five branches.

Paspalum sanguinale, Lamk., occurs on this land sparsely, and looks happier on the roadside out of reach of the salt.

Eriochloa polystachya> H,B. & K. The many-stemmed woolly grass (as we may translate its name) is as glabrous as a grass may be. It is abundant and vigorous on this land.

Panicum pzcnctatum, Burm., is probably the most abundant of all plants on the land under consideration, occupying generally the higher parts of the banks; it is decidedly vigorous.

It is also the principal grass in the cultivated meadows of the district which have an altitude a few feet higher than the land on which those plants were found.

Panicum colonum, Linn.
Ischcemum rugosum, Salisb.
Iseilema laxum, Hack.
Pennisetum typkoideum, Pers.
All occur in weakly tufts.

Sporobolus glaucifolius, Hochst, appears to be vigorous and at .home; its plant-body resembles " Hariyali" in a striking degree, but the flowers are quite distinct.

Cpiodon dactylon, Pers., " Hariyali/' is an extremely wide spread grass; it occurs from the south of England to Australia, thriving on moist sandy soils, but capable of bearing much drought, and apparently indifferent to salt. It may be observed growing up through the stable refuse forming the Esplanade ride, while its companion on the adjoining land, *Ischmmum ciliare,* Retz., is not vigorous enough during the cold season, to pierce the covering.

Chlorh barbata, Swartz.
Eleusine indica, Gaertn. and
.Leptochloa arabica are grasses of a weedy habit growing anywhere, but
Diplachne fusca, Beauv., is characteristic of moist and salt tracts. It is really very abundant near Bombay, but does not appear to have been observed until recently.

*The last plant to be presented is *Muropus littoralis, Part.,* a creeping grass characteristic of salt tracts.

The plants of the foregoing list may be separated into true halophytes or salt-loving plants: plants indifferent to salt; marsh plants and weedy plants which grow almost anywhere.

HALOPHYTES.

Peganum Harmala, Linn.
Blumea ampleclans, DC+ Var. maritima.
Heliotropium indicum, Linn.
Cressa cretica, Linn.
Suadafruticosa, Forsk.
Scirpus maritimus] Linn.
Eriochloa poli/stacftga, H. B. & K.
Sporobohcs glaucifolius, Hochst.
JEluropus UUoralis, Pers.

PLANTS INDIFFERENT TO SALT.

'Portulaea oleracea, **Linn.**
Thespesia populnea, **Corr.**
3£alac7ira capitata, **Linn.**
Carica papaya, **Linn.**
Molingo Kirta, **Thunb.**
M. Spergula9 **Linn.**
F&niculum vulgare, **Gaertn.**
Carum copticum, **Beuth.**
Cordia Hothii, **Ream. & Sch.**
Hicinus communisy **Linn.**
Cynodon dactyl on, **Pers.**

MAKSH PLANTS.

Tamarix sp.9 **not in flower.**
Ammania haccifera, **Linn.**
Jjudwigia parviflora9 **Roxb.**
Cossulia axillarisj **Roxb.**
Ztepidagathis cristata, **Willd.**
Jjippia nodiflora, **Rich.**
Fanicum punctatum, **Burn.**
Diplachne fusca, **Beauv.**

The remainder may be included in the section—Plants of a weedy character.

G. I. C. P. O.—No. 436 B. & A.— 5-11-97.— 31O—J. C.

EEPORT OF THE DIRECTOR OF THE BOTANICAL SURVEY OF INDIA FOR THE YEAR 1897-98.

During 1897-98 full advantage was taken of the funds placed at the disposal of the Botanical Survey for botanical exploration in Assam and in Burma, the portion of Assam to which attention was directed being the Bootan frontier, and the portion of Burma to which the energies of the department were chiefly devoted being the Kachin Hills. In the former area unassisted native agency had to be relied on; in the latter the department benefited by the assistance given by Lieutenant E. Pottinger, R.A., whose expedition, the commencement of which was noted in last year's annual report and which terminated in June 1897, was very successful botanically. Lieutenant Pottinger's good offices were not, however, confined to the work of collection during his journey; he was kind enough while at Myitkyina to enlist the sympathies of Lieutenant Cruddas, I.S.C., Commandant of the Police Battalion there, on behalf of the survey. Lieutenant Cruddas has most kindly looked after the Collector Mokeem, who was put under his charge before the close of last year, and the collections sent to Calcutta as the result of this arrangement have proved exceedingly interesting and valuable. Mr. Peohé of Moulmein has, as in former years, helped the survey by making collections on its behalf, and towards the close of the year the Rev. Julius Smith of Tounghoo also kindly volunteered to assist. The best acknowledgments of the Director are due to Dr. Watt, C.I.E., for much assistance in dealing with the material obtained by himself and other collectors in Assam.

2. *Survey of Northern India.*—The Report for 1897-98, prepared by Mr. Duthie, who was in charge of the department throughout the year, is submitted in original. His duties have included the instruction and examination in Botany of the students of the Forest School at Dehra Dun, the inspection of Government Gardens and Parks at Lucknow, Allahabad and Agra and of the reserves at Aligarh, a visit to Balrampur in Oudli to^examine and report on a large number of famine food-products collected in the neighbouring jungles, and a visit to Calcutta in order to compare with material in the Herbarium there a number of the critical plants obtainedby the collectors working under his direction on the North-Western Frontier during the year. These collections have been made by Mr. Duthie's two collectors, Inayat Khan and Harsukh—by the latter in Beluchistan, Hissar and Rohilkhand, by the former in Hazara, in Oudh and especially in Tirah, whither Mr. Duthie was able to send him during the expedition: Colonel Sir T. Holdich, K.C.I.E., kindly looked after Inayat Khan throughout the war. A number of officers engaged in the military expeditions along the North-West Frontier have also assisted the Department by kindly sending to Mr. Duthie collections of plants met with by them. The progress made during the year in the preparation of a [tc] Flora of the Upper Gangetic Plain " is detailed in Mr. Duthie's report; this progress has been very marked. Mr. Duthie has also been able to make some progress in the preparation of the materials for the "Flora of the Punjab Plain and Rajputana."

3. *Survey of the Bombay Presidency.*— Mr. G. Marshall WoodroW, who has been in charge of the department throughout the year, submits the annual

report which is also forwarded in original. During the year Mr. Woodrow made a tour through a portion of the Peint Taluka into the Dang country; in the course of this tour a number of interesting observations were made.

4. *Survey of Southern India.*—Eor a third time no annual report has been submitted from this survey.

5. *Publications.*—For the *Records of the Botanical Survey* three papers have been prepared, *viz.*:—No. 9, *Report on the plants collected during the Chitral Belief Expedition of 1895,* by Mr. Duthie ; No. 10, *A botanical tour in Chamba and Kangra,* by Mr. G. A. Gammie; No. 11, *A Note on the botany of the Kachin Hills, North-East of Myitkyina,* by Lieutenant Pottinger and myself. The final proofs of all three have been passed, but none of them have yet been issued owing to the map that is to accompany No. 9 not having *J^t* been completed. Mr. Woodrow has continued his catalogue of plants of Western India, which has been given as an appendix to his Report.

6. *Economic and Agricultural Botany.*—Mr. Duthie, as already stated visited Balrampur in order to examine and report upon famine food-products. I was able to make a beginning with a study of the Leguminous crops of Bengal, and hope eventually to be able to deal with them fully in a note for the Provincial Bulletins of the Department of Land Records and Agriculture, Bengal. During the year a *Note on the mustards cultivated in Bengal* has been published in this way and has also appeared as an Agricultural Ledger. The prficis of the Literature of wheat-rust mentioned in last year's Report was completed and published during the year.

7. *Staff.*—Sir George King, K.C.I.E., ceased to be Director of the Botanical Survey on 28th Eebruary 1898, on the afternoon of which day he made over, to me the charge of the Department. His services to the Survey it is impossible to overrate. Mr. N. B. Ranade, Curator of the Herbarium, Poona, died on 15th October 1897. He was an excellent officer whose loss is greatly to be deplored. The post he occupied has not yet been filled, but it is to be hoped that his successor may be appointed as soon as possible.

CALCUTTA, *The 12th July 1898.*

DAVID PRAIN, *M.B.,*
Surgeon-Major, J. *M. S.,*
Director of Botanical Survey of India.

Annual Report of the Director of the Botanical Deuartment, Northern India, for the year 1897-98.

I left Saharanpur on the 8th of April to join tho Forest School camp at Chakrata, from which place I accompanied the students as hotanical instructor on their tour through Jaunsar and portions of Tihri-Garhwal until the end of May.

On the 8th of June I arrived at Mussoorie and remained there till the 12th of October. My time at Mussoorie was chiefly occupied in the preparation of materials for a book on the " Flora of the Upper Gangetic Plain. " On my way to Saharanpur I halted for a few days at Dehra to collect specimens and to obtain some information at the Forest School herbarium, where the local flora is very fairly represented, I arrived at head-quarters on the 22nd of October.

On the 7th of January I met the Director of Land Records and Agriculture, North-Western Provinces and Oudh, at Aligarh, where we inspected the Usar reserves at Oherat and Gursikran; and on the 24th of that month we visited the Juhi reserve near Cawnpore.

On the 2nd of February I left Saharanpur for Balrampur in Oudh to examine and report on a large number of famine food-products collected in the neighbouring jungles, and arranged for exhibition by Mr. Innes, the agent of that estate, on the occasion of a visit made to that place by His Honour the Lieutenant-Governor.

I left Saharanpur again on the 9th of February for Calcutta to work for a few days at the Herbarium of the Royal Botanic Garden, and on my return journey I visited the Government gardens at Allahabad and Luck now.

On the 19th of March I went to Dehra to assist at the final examinations at the Imperial Forest School, and returned to Saharanpur on the 29th of that month.

BOTANICAL TOURS.

Baluchistan.—Captain Norman, Commandant of the Zhob Levy Corps, was kind enough to allow one of my plant collectors, Harsukh, to accompany him on his tour of inspection through his district during May and June. This portion of Baluchistan had been very little explored, and some very interesting plants were collected.

Sazara.—Inayat Khan, the head plant collector, was again sent to tho Kagan Valley in order to complete the collections from this interesting tract of country. He worked there for four months, from the beginning of May, and brought back a large number of valuable specimens.

Hissar (Punjab).—Harsukh, plant collector, was sent to Hissar in September to make a collection of grass seeds for sending to the United States Department of Agriculture and to Madeira. He also took the opportunity of collecting herbarium specimens of the more interesting flowering plants which are to be found in this district. The Superintendent of the Cattle Farm kindly gave him permission to collect the grass seeds on the grass land attached to the farm.

Tirah.—I was fortunate in obtaining permission for Inayat Khan to accompany the military expedition through Tirah last yesyr. He wa^'placed under the immediate charge of the Chief Survey Officer, Colonel Sir T.

Hungerford Holdich, K.C.I.E., R.E., who very kindly looked after him all the time. Although it was much too late in the season for obtaining anything like a complete collection of plants from this previously unexplored country, he managed to bring back specimens representing over 100 species, including a new genus of Labiatae, for which I have proposed the name of *Afridia.*

Gorakhpur, Oudh and Bohilkhand.—Two plant collectors, Inayat Khan and Harsukh, left Saharanpur on the 19th of March to make collections of plants in the submontane districts of Oudh and Rohilkhand. Harsukh was sent to Gorakhpur with orders to collect specimens in that district, and afterwards in that of Gonda. Inayat started work at Kheri, and was ordered to explore the forests of that district and those of Bahraich and Pilibhit. The fresh material which will thus be obtained from this tract of country will, I hope, be of considerable assistance to me in the preparation of the local flora upon which I am now engaged. I am much indebted to Mr. Eardley-Wilmot for his kindness in affording every facility to my collectors whilst travelling through the forests under his charge.

Herbarium.—The collections made during the several tours alluded to above contained a considerable amount of new material. The herbarium has also been enriched by numerous contributions, including some interesting collections made by certain officers during the recent military expeditions along the North-Western frontier. The following is a list of the contributors :—

1. *The Director, Royal Botanic Garden, Calcutta.*—Upwards of 600 sheets of specimens, including a valuable collection of Sikkim orchids.
2. *T. W. Naylor Beckett, Esq.*—New Zealand mosses, 100 kinds.
3. *K. Bichter Lajos, Budapest, Hungary.*—A large collection of dried specimens, chiefly from East Europe.
4. *J. Sykes Gamble, Esq.*—Twenty-two kinds of grasses from the Bombay Presidency, and 11 species of bamboo from British Bhutan and Sikkim.
5. P. *W. Mackinnon, Mq.*—Several interesting specimens of plantsr from the neighbourhood of Mussoorie, some of which had not been previously recorded so far west.
6. *G. Marshall Woodrow, Esq.*—Seventeen kinds of rare grasses from the Bombay Presidency.
7. J'. *Martin, Esq. {Forest Survey).*—A fine collection of ferns from Chamba,
8. *Surgeon-Captain E. C. Hare.*—A large and interesting collection of plants from the Samana range.
9. *Surgeon-Captain C. J. Milne.*—Some interesting collections of plants from Buner, Jamrud, and the Khyber Pass.
10. *Surgeon-Lieutenant- Colonel Wright.*—A number of specimens col* lected in the neighbourhood of Drosh.
11. *Major G. Wingate, Chief Commissariat Officer, Tochi Tield Force.—A* large number of specimens from the Tochi Valley* These were mostly samples of plants used as camel fodder, and they were sent to Saharanpur for identification.
12. *Captain Pirrie {Survey Officer) and Captain C. B. Beid, IV Sikhs.*— Collections of plants from the Tochi Valley.

13. *Captain Skey, B.R9—A* large number of specimens collected on his journey to Chitral last summer.

DISTRIBUTION.

Herbarium specimens.—To the Director, Royal Botanic Garden, Calcutta, over 4,000 sheets of North-Western Indian plants were sent.

Sets of Kashmir and North-Western Himalayan mosses were sent to—

The Director, Royal Gardens, Kew.
The Director, Royal Botanic Garden, Calcutta.
The Keeper of the Botanical Department, British Museum.
T. W. Naylor Beckett, Esq., New Zealand.
M. B. Waterfall, Esq., Bristol.
J. Sykes Gamble, Esq., Dehra Dun.

Seeds and bulbs.—Collections of seeds of Himalayan and North-Western Frontier plants were sent to the Royal Gardens at Kew and Edinburgh ; the Botanic Garden, Cambridge; George Wilson, Esq., Weybridge Heath; Mons. Correvon, Geneva; the Imperial Garden, JSt. Petersburgh; the Royal Horticultural Society of Tuscany; and to the Royal Botanic Garden, Vienna.

A large quantity of seed of different kinds of Indian grasses was sent to Professor F. Lamson-Scribner, Agrostologist to the United States Department of Agriculture; to Mons. H. Buysman, Middleburg, Holland; also to Mr. Blandy for sowing in Madeira. To the latter gentleman were also sent 51bs. of the seeds of *Desmodium triflorum* for trial in Madeira as a soil-binder.

Several packets of American grass seeds, received from Professor Lamson-Scribner, were made over to the Superintendent of the Government Botanical Garden, Saharanpur, and to the Director of Land Records and Agriculture, North-Western Provinces and Oudh, for trial sowings.

By request of the Secretary to the Kishengarh Durbar, Rajputana, 51bs. nf "R.ICTQ flav c*WI n/nd 11VI_ nvF fhp> VP>qf Turkish tohfl.ftf»,o were nhf.å/inftrt for ramar-i-mental sowings in that State.

A collection of Iris bulbs from Hazara was sent to Dr. Michael Foster at Cambridge.

Miscellaneous.—A collection of wood specimens of the various species of Berberis found on the Western Himalaya was sent through Mr. Woodrow, Poona, for chemical analysis in England.

A large collection of vegetable economic products, including dried fruits, seeds, etc., were sent to the Science and Art Museum, Dublin.

A collection of clay models of fruits and vegetables, with glass case, was sent to the Director of Land Records and Agriculture, North-Western Provinces and Oudh, for the use of the Cawnpore Agricultural School.

"THE FLORA OP THE UPPER GANGETIC PLAIN."

Having received instructions from the Government of India to state in my annual report what progress had been made in the preparation of this work, I have to report as follows :—

1. A rough list to the end of *Oraminece* has been prepared of all the plants known to occur within the proposed area.
2. Keys to the genera have been compiled up to the end of *Disciflorce,* as well as descriptions of the natural orders and most of the genera up to that point.

Some progress has also been made in the preparation of materials for the Flora of the Punjab Plain and Bajputana.

OFFICE ESTABLISHMENT.

The draughtsman has nearly completed the illustrations of the Indian *Boraginece.* He has also made several good drawings' of undescribed species belonging to other natural orders. By request of the Director of Land Records and Agriculture, North-West em Provinces and Oudh, his services were utilized for a few days in the preparation of a series of coloured plates of most of the varieties of sugar-cane grown in these Provinces.

The Head Clerk, Umrao Singh, and the Assistant Clerk, Hutehinson, have done very creditable work during the year, and I am satisfied with the way in which the other members of the establishment have performed their duties.

MUSSOORIE,
The 15th June 1898.

J. R DUTHIE,
Director^ Botanical Department,
Northern India.

APPENDIX.

Financial statement of the Botanical Department, Northern India, during the year 1897'98.

BOTIVICAl DEPARTMENT.	EXPEJfDITUBE.							RECEIPT.			
	Director's salary.	Exchange compensation allowance.	Establishment.	Travelling allowance (Gazetted Officer).	Travelling allowance (Establishment),	Contingencies.	Total.	Fodder Grass Books.	Fodder Grass albums.	Miscellaneous.	TOTAL
	£ a. p.	R a. p.	8 a. p.	R a. p,	R a. p.	R a. p.	R a. p.	£ a. p.	£ a. p.	8 a. p.	R a. p.
Bndget giant for 1897-98	10,200 0 0	1,350 0 0	4,070 0 0	1,700 0 0	300 0 0	2,050 0 0	19,670 0 0	...	...	...	...
Expenditure during 1897-98	11,733 13 11*	956 6 11	3,933 1 0	1,713 8 0	215 2 0	2,02? 14 8	20,579 14 6	...	...	...	...
Exceeds	1,533 13 11	...	...	13 8 0	...	...	1,547 5 11	...	...	...	...
Balance	...	393 9 1	136 15 0	M«	84 14 0	22 1 4	637 7 5	...	...	...	...
Realized by Bale daring 1897-98	...	...	...	. ..	...	...	...	45 10 0	...	...	45 10 0

• This includesjthe increase of salary to £1,000 from the 26th May 1897, *vide* Government of India, Department of Bevenue and Agriculture, Order No. 146-45-1, dated 8th Jane 1897.

MUSSOOBIB,

The 15th June 1898.

J. P. DUTHIE,

Director, Botanical Department, Northern India.

Report on the work of the Botanical Survey, Bombay, for the year 1897-98.

1. The tour for this year was through a portion of the Peint Taluka into the Dang country.

2. The route selected was from Peint town due north to Waghai, Dang ; as nearly as possible the line followed was that of 73° 33" W. Long.

3. There are no roads on this route except foot-paths from village to village. The villages shown on the map are only a few miles apart, but they consist of very few houses, which stand widely separate from each other and have walls of strong bamboo basket-work, plastered with mud. The walls were in several instances seen entirely removed for repair, and the advantage of such a system was striking in view of the devastation by plague in closely built cities.

4. The rocks are trap and the soil a yellowish brown, stony, sedentary formation from the underlying rock.

5. The rainfall may be estimated from the occurrence of plants which thrive under a known measurement of rain at 80—100 inches annually.

6. The people are chiefly of the Boli and Bunbee castes.

7. The staple crops are Rice *(Oryza sativa)*, Nagle *(Eleusine coracana)*, and Wari *(Panicum tniliaceum)*. The only fruits cultivated were small patches of Bananas near the houses : these are not irrigated. But the mango naturally grows luxuriantly ; one mango tree which I measured was sixteen feet in circumference four feet from the ground. The vigour of the mango trees induced me to advise the headmen of some of the villages to procure the finer sorts of mango and make money by exporting the fruit to Bombay, and to offer assistance in getting plants of good sorts; but they did not show any enterprise in that direction.

8. The forests have—

Saag.—Tectona grandis, *Linn.f.*
Shewan.—Gmelina arborea, *Linn.*
Hed.—Adina cordifolia, *Book.*
Sadara.—Terminalia Arjuna, *Bedd.*
Damoda.—Anogeissus latifolia, *Wall.*
Tewaz.—Ougenia dalbergioides, *Benik.*
Koosumb.—Schleichera trijuga, *Willd.*
Chinch.—Tamarindds indica, *Linn.*
Bael.—*Egle Marmelos, *Corr.*
Moreshing.—Dolichandrone falcatum, *Seem.*
Shendree.—Mallotus philippinensis, *MuelL*
Alun.—Elaeodendroa glaucum, *Pers.*
Chamail.—Bauhinia Lawii, *Benth.*
Boot Chamail.—Bauhinia, sp. inc.
Panjambul.—Eugenia rubicunda, *Wight.*
Burwei.—Hymenodiction obovatum, *Wall.*
Petaree.—Trewia nudiflora, *Linn.*
Sirus.—Albizzia Lebbek, *Benth.*
Mohwa.—Bassia latifolia, *ftoxb.*
Bheii.—Acacia feiiuglne*, D %C.
V\ ad.—Ficus bengalensis, *Linn.*
iiuralu Wad.—F. mysorense, *lie y tie.*
Madal.—Rhus mysorense, *Heyne.*

Govindu.—Diospyros govindu, *Dalz.*
Aloo.—Vangueria spinosa, *Roxh.*
Timboornee.—Diospyros montaaa, *Roxb.*
Kakar.—Flacourtia Ramontehi, *Linn.*
Booda.—Wrightia tinctoria, *Br.*
Bur wand.—Carissa Caraudas, *Linn.*
Pangara.—Erythrina suberosa, *Roxb.*
Birmira.—Glycosmis pentapbylla, *Corr.*
Datira.—Ficus gibbosa, *Bl.*
Chandul.—Sterculia urens, *Roxb.*
Amba Pyer.—Ficus Tjakela, *Burnt.*
Burak Pyer.—F. RumpMi, *Bl.*

9. The Mohwa tree was in full bearing. The succulent corolla begins to fall to the ground at daybreak and continues till noon: during this time women and children may be seen on guard against cattle and collecting the flowers.

10. Ficus gibbosa, BZ., here called *Datira,* occurred frequently, and Ficus mysorense, *Heyne*, *Buralu Wad%* was also abundant. This tree is distinctly epiphytal, and I had not hitherto met with it so far north. The fruit was ripe and showed numerous staminate flowers in pollen mixed with the ripe pistillate and gall flowers near the meridian line as occurs in Ficus bengalensis, ***Linn.***

11. The fruit and flowers of Pueraria tuberosa, DC, *Bender Coil,* and the fruit of Spatholobus Roxburghii, *Benth, Pallas Wail,* were gathered. Imperfect specimens of those plants had previously given much trouble in the herbarium.

12. An arborescent Bauhinia, *Boot Chamail,* which, apparently, is undescribed, was observed, and the headman of Hatlond village was promised a reward if he sent flowers of it to the herbarium at Poona. The tree appears either to have inconspicuous flowers or to bloom rarely, as the people had never observed the'flowers.

13. Erythrina suberosa was abundant in ripe fruit. The legume when ripe is black and coriaceous, and it opens completely some time before the seed falls, in the manner of Sterculia and Adenanthera.

14. Of Orchids only three common species and of Ferns only Cheilanthes farinosa were observed. Thysanoloena agrostis, *Nees,* which in a natural state had long escaped observation, was collected.

15. In all 175 species were collected or observed, but as the list is not complete I have thought proper to retain it.

16. Near Tatpani village on my route are hot springs. The temperature at Boon in April was 90° P. The people said the water was much hotter in the cold season. From this I infer that the temperature is nearly constant throughout the year; it will be hotter to the touch in cold weather. The odour of the water was faintly that of hydrogen sulphate, and the taste somewhat more nauseous than that of warm water. There were no plants visible in the water, and the surrounding vegetation was not peculiar in any way.

17. I had now entered the Dang country, where the forest is very dense and cultivation almost entirely absent, and the country excessively broken up by huge trap dykes. I found I was much too early for sprouting tuberous roots, Tnd as I had elected to do as much as possible of the entire journey from Poona on foot, on reaching Waghai Dang I had walked over 150 miles, and the effects of fatigue and bad water compelled me to return quickly by railway.

18. In December 1897 and January 1898 I spent nearly a month at Jeur, Sholapur district, and collected 130 species, including an interesting grass well known to the people and used as food on fast days, called *Tan Sawa.* I have described this grass as Isachne obscurans and distributed specimens to the principal herbaria.

19. Pandharpur was visited : its flora recorded and specimens of the remarkable local plant, Jatropha glandulifera, *Hoxb.,* procured.

SO. The synopsis of the Flora of Western India has been advanced to the end of Composite. A copy of it is attached.

21. The Sisal hemp plantation at Nangaon is making good progress ; it has now 400 plants, and all except a few weakly plants stood throughout the hot season without watering or special care. Bowstring Hemp plants treated in the same manner failed completely.

22. While visiting the plantation I was fortunate enough to find good specimens of Dicselospermum Ritchiei, C *JB. Olarke,* some of which were transaitted to the author of the genus. Nanothanmus sericeus, *Thorns,* was also id abundant near Lanauli.

^23. The work of the Survey suffers much from the loss of Mr. N. B. Ranade, who died on 15th October 1897. Mr. Ranade went out to search for IPreria indica, *Dalz%* a plant which had eluded our collectors. He returned successful, in fair health, to his home in the plague-stricken city of Poona ; a few days later he became unwell and the end came quickly. His place is not yet filled, but I expect soon to get the assistance of Mr. M. S. Taggersee of the Eorest Department, who was lately a student of this college.

POONA,)
> G. MARSHALL WOODROW,
The 30th June^ 1898.) *Officer in charge Botanical Survey*[r], *Bombay-*

APPENDIX.

THE FLOEA OF "WESTERN INDIA.

BT G. MiBSHAIX WOODROW, PEOFBSSOE OP BoTINT, COLLEGE OF SCIENCE, POONA.

{Continued from Appendix I of Annual Report for 1896-97.)

PART II.

8, *Erinocarpus.*

E. Nimmoanus, *Grah,* F.B.I.—1-394. *Cherd.* W. Ghâts, Konkan. Nov.-Dec.

9. *Triumfetta.*

T. pilosa, *Roth.,* F.B.I.—1-394. Marmagoai November.
T. rhomboidea, *Jacq.,* F.B.I.—1-305. *Chikti.* Deccan, Guzerat, widely. Nov.
T. rotundifolia, *Linn.,* F.B.I.—I-3iJ5. Poona. August.

10. *Corchorus.*

C. capsularis, *Linn.,* F.B.I.—1-397. Surat, Bombay, Vingnrla. September.
C. olitorius, *Linn.,* E.B.I.—1-397. Guzerat, Decoan, widely. September.
C. trilocularis, *Linn.,* F.B.I.—1-397. Decoan, Guzerat, Sind, widely. Sept.
C. fascicularis, *Lam.,* F.B.I.—1-398. *Bahuphali, HaranaMuri.* Deccan, Guzerat. September.
C. antichorus, *Roeusch.,* F.B.I.—1.398. *Mudhiri* Rajkot. Sept.-Oct.
C. tridens, *Linn.,*—F.B.1.—1-398. Sind.
C. acutangulus, *Lam'.* F.B.I.—1-398. Parel, Konkan, widely. September.

13. *JElceocarpus.*

E. Gauitrus, *Roxb.,* F.B.I.—1-400. *Rudr&Jcsha.* W. Ghâts, *DeCrespigny.*
E. oblongus, *Gaertn,* F.B.I.—1-403. *Kasava Kasa.* Mahableshwar. Hay.
E. tuberculatus, *Boxb.,* F.B.I.—1-404. *Bvdrah.* W. Ghâts, *DeCrespigny.*

XXIX.—LlNEiE.

1. *Linum**

L. Bsitatissimum, *Linn.,* F.B.I.—1-410, *Jawas.* Cult. February-March.
L. mjsorense, *Heyne,* F.B.I.—1411. *Undri.* W. Ghâts, Kolhapur. Oct.-Jan.

2. *Reinwardtia.*

R. trigyna, *Planch.,* F.B.I.—1-412. Miradongar, near Pen, Konkan.
In gardens widely. Oct.-Jan.

7. *Erythoxlon.*

E. coca, *Lam.,* DC, Prod, 1-575 Coca plant. In gardens. Cult.

XXX.—MAIPI GIACE JE.

2. *Hiptage.*

H. madablota,6fae^.,F.B.i.—1-418. *Madhum&lati.* W. Ghâts, Mulher. Feb.

8. *Aspidopteris.*

A. Roxburghiana, *A. Juss.,* F.B.I.—1-420. Hills near Satara. December.
A. canariensis, *Dalz.,* F.B.I.—1-420- Kumta-Sirsi Road, Nilkund, N. Kanara. March,
A. cordata, *A. Juss.,* F,B.I.—1-421. *Buryel.* Londa. Mathoran. Sept.-Oct.

XXXL—ZYGOPHYLLEJ2.

1. *Tribulus.*

T. terrestris *Linn.,* F.B.I.—1-423. *SaratL* Sind, Decoan, widely, nearly all year.
T. alatus, *Del.,* F.B.I.—1-423. *Nindo trikundri.* Sehwan. Sind. Sept.-Dec.

2. *Seetzenia,*

S. orientalis. *Dene.,* F.B.I.—1-424. Laki, Sind. October.

3. *Zygophyllum.*

Z. simplex, *Linn.,* F.B.I.—1-424. *Alethi Putlani.* Karachi, Sind, widely. Dec.

4. *Fagonia.*

F. arabica, *Linn.,* F.B.I.—1-425. *Dhamdsd.* Bijapur. Sind. ^ Oct.-Dec.

XXXII.—GEBANIACEJE.

2. *Monsonia.*

M. senegalensis, *Ouill $ Perr.*, F.B.I.—1-427. Ganesh Khind, Poona.
M. heliotropioides, *Cav.*, F.B.I—1-428. Thano Bulo Khan Road, 51 miles from Karachi. Aug.

4. *Er odium.*

E. cicutarium, *Leman.*, F.B.I.—1-434. Quetta. Tata Dist., Sind. Feb.-Dec.

5. *Ox alls.*

O. corniculata, *Linn.*, F.B.I.—1-436. *Ambushi.* Konkan, Deocan, Guzerat. Oct.-May.

6. *Biophytiim.*

B. sensitivum, *DC,* F.B.I.—1-436. Poona, Baroda. Oct.-Jan.

7. *Averrhoa.*

A. carambola, *Linn.*, F.B.I.—1-439. *Karmar.* Cult.
A. Bilimbi, *Linn.*, F.B.I.—1-439. *Bilimbi.* '' Cult.

8. *Impatiens**

I. Beddomei, *Sook.f.* F.B.I.—1-442. Western India. *T>eCres<pigny.*
I. Stocksii, IT./. & *T.*, F.B.I.—1-442. Mountains of the Koukan *Law. Stocks.*
I. acaulis, *Am.*, F.B.T.—1-443. W. Ghats. October.
I. rivalis, *Wight,* F.B.I.— 1-444. Konkan, *Stocks.* Aug.-Feb.
I. chinensis, *Linn.*, F.B.I.—1-444. *Sumpkund, Yacombi.* N. Kanara.
I. Kleinii, *W.* & *A.*, F.B.I.—1-445. Castle Rook. *Sumpkund.* N. Kanara. Oct.-July.
I. inconspicua, *JBenth.*, F.B.I.—1-417. *Dalzell & Gibson.*
I. oppositifolia, *Linn.*, F.B.I.—1-448. Ghat Road, Wadi to Paladpur. Oct.
I. Lawii, JET. *f. & T.,* F.B.I.—1-448. Castle Rock, W. Ghats. October.
I. Dalzellii, *H.f. & T.,* F.B.I.—1-449. Purandhur, Mahableshwar. Sept.
I. balsamina, *Linn.*, F.B.I —1-453. *Terda.* W. Ghats, widely. Aug.-Nov.
I. pulcherrima, *DaU.*, F.B.I.—1-458. Londa Road, Wadi to Paladpur, W. Ghats. Sep.-Oct.

XXXIII.—RUTACEiE.

1. *Ruta.*

R. graveolens, *Linn.*, F.B.I.—1-485. *Stdap.* Cult.
R. tuberculata, *Forsk.*, F.B.I.—1-485. Boogta hills in Sind, *Vicary.* Sibi. Dec.

3. *Peganum.*

P. Harmala, *Livn.*, F.B.I.—1-486. *HarmaL* Bijapur, Phaltan, Hjderabad, Sind. Oct.-Dec.

5. *Evodia.*

B. Roxburghiana, *Benth.*, F.B.I.—1-487. Mahableshwar. May.

8. *Zanthoxylum.*

Z. ovalifolium, *Wight,* F.B.I.-1-492. Ramghat, *Dalzell.* Nov.-Dec.
Z. Rhetsa, *DC,* F.B.I.—1-495. *Chirphal, tiryhal, tisal.* Wartil, Ratnagiri Dist., in fruit. October.

9. *Toddalia.*

T. aculeata, *Pers.*, F.B.L-I-497. Ramghat, *Dalzell,* Sirsi. Nov.-Dec.

lfl. *Achronychia,*

A. lanrifolia, *Blume.*, F.B.I.~I-498. Karwar, Godhuli, N. Kanara, *Talbot.* August.

12. *Glycosmis.*

pentaphyna, $C_O$rrea., F.B.i.-I-499. *Kirmira.* Castle Rock, Khandalla. Nov.-Mar.

14. *Murray a.*

M. exotica *Linn.*, ».B.I._I-502. JT«»«, *Cktdajuti.* Khandalla, W. Ghato. June-Oot.
M. K«mgu, *Sprang.*, M J .-1-603. *Kodhi Limba.* HilU near Pooua, planted widely. Feb-April-

15. *Clausena.*

C. indiea, *Oliv.*$_9$ F.B.I.—1-505. -m nuA$_X$ TI *7**77*
C. Willdenovii, *W. * A.*, ,.B.,-I-506. chorla ^ ^ J J ^ Dais £

16. *Triphasia.*

T. trifoliate *DC,* F.B.I.-W07. Garden..

18. *Luvunga.*

L. eleutherandra, *Dalz.*, F.B.I.—1-509. Divimana Ghat. January.

19. *Paramignya.*

P. monophylla, *Wight,* F.B.I.—1-510. *Kurwa Wagati.* Amboli Ghat, forest 23 miles west of Ratnagiri. Nov.-Jan.

20. *Atalantia.*

A. monophylla, *Correct,* F.B.I.—1-511. *Makad-limbu.* Amboli Ghat. November.

21. *Citrus.*

C. medica, *Linn.*, F.B.I.—1-514. *Maliadungi.* Cultivated.
C. do. *Adda.*, F.B.I.—1-545. *Zimbu,* Sour Lime. Cultivated.
C. do. *Limetta.*, F.B.I.—1-515. *Mitta Zimbu,* Sweet Lime. Cultivated.
C. aurantium, *Zinn.*, F.B.I.—1-515. *Narangi,* Sweet Orange.
Zadoo, Navel „
Cintra, Nagpur „
KJiaguzif Mozumbique, „ thin-skinned.
GJwradya, Do. „ thick-skinned.
C. decumana, *Zinn.*, F.B.I.—1-516, *Papanis.* Pumelo.

22. *Feronia**

F. elephantum, *Correct.*, F.B.I.—1-516. *Kavath.* JDeccan, planted widely. March.

23. *JEgle.*

M. Marmelos, *Correa,* F.B.I.—1-516. *BaeL* Deccan, planted widely. April-May.

XXXIV.—SlMAEUBE-E.

1. Ailanthus.

A. excelsa, *Roxh.*, F.B.I.—1-518. *Mahdruhk.* Deccan.
A. malabarica, DC, F.B.I.—1-518. Kumta-Sirsi Road, Nagotna. March.

9. *Balanites.*

B. Roxburghii, *Planch.*, F.B.I.—1-522. *Hinganbet.* Dharwar, Deccan widely. March.

XXXV.—OCHNACB*:.

1. *Ockna.*

O. squarrosa, *Zinn.*, F.B.I.—1-523. Gardens often, Castle Rock, W. Ghats. June.
O. pumila, *Ham.*, F.B.I.—1-524. S. Konkan. *Dalzell.*

XXXVI.—BuESEBACEiE.

1. *Boswellia.*

B. serrata, *Roxb.*, F.B.I—1-528. *Sdlai.* Hills in Deccan, widely. Feb.-March.

3. *Garuga,*

G. pinnata, *Roxb.*, F.B.I.—1-528. *Kdhad.* Guzerat and Deccan hills. Jan.-Feb.

4. *Balsamodendron.*

B. mukul, *Booh.*, F.B.I.—1-519. *Gngul.* Planted. Probably synonymous with B. Roxburghii.
B. Roxburghii, *Am.*, F.B.I.—1-529. *Gugul.* Planted. Peit, Poona District.
B. pubescens, *Stocks.*, F.B.I—I-529. Rocky Parts of Sind, *Stochs,*
B. Berryi, *Arn.*, F.B.I.—1-529. May.

7. *Canarium.*

C. strictun>,:Ro*6,S.B,i.-I.631. ^inshi. N. Kanara. Talbot. February.

10. *Filicium.*

F. decipiens, *Thw.*, F.B.I.—I-539. Planua Poona,

XXXVII—MBLIACB*.

1. *Turroea.*

T-viren8,Z;«».,*.B.l.-I.641. Jbhau^nghol. December-
T. viUosa, A M , S.B.I.-I-642. Koina Valley near Pen . MJune.

2. *Naregamia.*

N. alata, *W. Sr A.,* F.E.I.—1-542. Savantwadi, Karwar. Nov.-Dec

4. *Melia.*

M. Azadirachta, *Linn.,* F.B.I.—1-544. *Nim, Kadunimb.* Planted widely. Match.
M. Azedarach, *Linn._B* F.B.I.—1-544. *Bukhan.* Planted widely.
M. dubia, *Cav.,* F.B.I.—I-545. *Limb&rd.* Harihar, Yacombi, N. Kanara, Pnrandhar Taluka.

5. *Cipadessa.*

C. fruticosa, *Blume,* F.BJ.—1-545. *Gudmei.* Khandalla, W. Ghâts, Sept.

6. *Dysoxylum**

D. binectariferum, *Hoofaf%>* r.B.i.—1-546. Khandalla. Aug.-Sept.

10. *Lansium.*

L. ammalayanum, F,B.I.—1-558.*TelytL* Hoolical, Amboli, W. Ghâts. Nov.-Feb.

11. *Amoora,*

A. Eohitnka, TT. *$ A.,* F.B.I.—1-559. Widely planted in Gardens.
A. canarana, *JBenth. $ Hook.** F.B.I.—1-560. Goand. March.
A. Lawii, *Benth. 8f Hook.,* F.B.I,—1-561. Nilkund Ghât. Nov.

12. *Walsura.*

W. piscidia, *Boxb,,* P.B.I.—1-564. *Walsura, Walursi,* Ramgbat. Nov.

13. *Heynea.*

H. trijaga, *Boxb.,* F.B.I.—1-565. *Limb&rd.* Khandalla. Feb.-March.

SWIETBNIA. *(Occidental)*

S. Mahogani, *DC, Trod.,* 1-625. Mabagony. Planted. May.
S. macrophylla, *King.,* Large-leaved Mahogany. Widely planted.

16. *Soymida.*

S. febrifuga, *Adr. Juss.,* F.B.I.—1-567. *Bokan.* Thana District. March*

17. *Chickrassia.*

C. tabularis, *Adr. Juss.,* F.B.I.—1-668. *Lâi Devdari Dal mar a.* Yellapur. Jan.-Feb.

18. *Cedrela.*

C. toona, *Boxb.,* F.B.I.—1-568. *Mahanim, Tuni, Kudah.* Panchgani. Khandalla.

19. *Chloroxylon.*

C. Swietenia, *DC,* F.B.I.—L569. *Raldd.* Near Belgaum, Gokak.

XXXVIII.—CHAILLETIACEiE.

1. *Chailletia.*

C. gelonioides, *Hook.f.,* F.B.I.—1-570. Hegami Siddapur. *Young.* May.

XXXIX.—OLACINE2E.

X. americana, *Willd.,* F.B.I.—1-574. 1. *Ximenia.* Desur, Badami, S.M. Ry. Feb.

O. scanden3, *Boxb.,* F.B.I.—1-575. 5. *Olax.* Khandalla in fruit. Niikund, N. Kanara. Apr .-Mar.
O. Wightiana, *Wall,* F.B.S.—1-575, Dahili,near Poona. December.
0. nana, *Wall.,* F.B.I.—1-576. Rajkot. *C. MaoNagMen.* July-

6. *Strombosia.*

S. oeylanicai *Gurdn.,* F.B.I.—1-579. Poteli, N. Kanara. December.

9. *Cansjera.*

C. Rheedii, *Gmel.,* r.B.i.—1-582. Yellapur, N. Kanara. December.

13. *Gomphandra.*

G. polymorpha, *W. $ A.*, F.B.I.—1-582. Santaveri. December.

15. *Mappia,*

M. fcetida, *Miers.*, F.B.I.—1-589. *Bdnw&ngi.* W. Ghâts, widely. Sept.-Nov.

XL.—ILICINEE.

1. *Bex.*

I. malabarica, *Bedd.*, F.B.I.—1-598. W. Ghâts. *DeCrespigny.*

XLL—CEL ASTBINE JE.

1. *Euonymus.*

E. indicus, *Heyne.*, F.B.I.—1-608. Diyimana, Castle Rock, W. Ghâts, Dec.-Feb.

4. *Lophopetalum.*

L. Wightianum, *Am.*, F.B.I.—1-615. *Balpale.* Konkan, Sampkand. Feb.-Jane.

6. *JPleurostylia.*

P. Wightii, *W. Sf A.*, F.B.I.—1-617. Ghâts, Konkan. *Dalzell.*

7. *Cdastrus.*

C. panioulatus, *Willd.*, F.B.I.—1-617. *Karadkdngoni Mdlkdngoni.* Deccan and Guzerat, widely. Nov.-Feb.

8. *Gymnosporia.*

G. Rothiana, *W. Sf A.*, F.B.I.—1-620. Pancbgani, Matheran. Feb.-July.
G. montana, *Rozb.*, F.B.I.—1-621. *HehaL* Kamatkee Ghât, widely. October.

10. *Elceodendron.*

E. glaucum, *JPers.*, F.B.I.—1-673. *Bhutyd, B/mtkes, Aliin.* Deccan hills, Peint Taluk. Feb.-Aug.

11. *Hippocratea.*

H. obtusifolia, *Roxb.*, F.B.I.—1-623. Aioshi, N. Kanara. January.
H. Grahamii, *Wight,* F.B.I.—1-624. *ZioTchandi.* Ghâts, common. *DalzelL* Jan .-April.
H. indica, *Willd.*, F.B.I.—1-624. Divimana. April.

12. *Salacia.*

S. prinoides, D C , F.B.I. 1-626. Dehalli, N. Kanara. *Talbot.* January.
S. Brunouiana, *W. Sf A.*, F.B.I.—1-626. Ramghat. *Dalzell.*
S. Roxburghii, *Wall.*9 F.B.I.—1-627- Jambhodara, near Atgaon. March.
S. macrosperma, *Wight.*, F.B.I.—1-628. Ainshi Ghât. Nov.
S. oblonga, *Wall.*, F.B.I.—1-628. ChorlaGhât. *Dalzell.*

XLII.—RHAMNE-E.

1. *Tentilago.*

V. madraspatana, *Gaertn.*, F.B.I.—1-631. *LoJcJiandi.* *23* miles east of Ratnagiri. Jan.
V. caiyculata, *Tul.*, F.B.I.—1-631. Dharwar, Yellapur, Sumasgi, Oct.-Dec.
V. bombaiensis, *Dalz.*, F.B.I.,—1-631. Tinai, Chorla Gh4t, Konkan. *Da zdlL*

3. *Zizyphus.*

Z. Jujuba, *Lamk.*, F.B.I.—1-632. *Bor.* Deccan, Gazerat, Sept.-Oct.
Z. glabrata, *Heyne,* F.B.I.—1-632 Ahmedabad, Surat. Nov.-Dec*
Z. nummularia, *W. Sf A.*, F.B.I.—1-632. Broach, Guzerat. Dec.
Z. (Enoplia, *Mill.*, F.B.I.—1-632. Badami, Dharwar. August.
Z. xylopyrus, *Willd.*, F.B.I.—1-632. *Ghoti, Ghotbor.* Hills near Poona. June-Ausrust.
Z. rugosa, *Lamk.*, F.B.I.—1-636. *Toran.* Igatpura, Forests near W. Ghâts. Feb.

5. *Ithamnus.*

R. triqueter, *Wall.*, F.B.I.—1-639. Kori Fort, 12 miles south of Lanauli. Feb.

Scutia.

S. indioa, *Brongn.*, F.B.I.—1-640. *Chimat.* Mahableshwar. Feb.-April.

Jl. Qouania.

G. miorocarpa, *DC,* F.B.I,—1-643. Diyimana, ^T. Kanara. Dec.

XLIIL—AMPELIDEE.

1. *Vitis.*

V. quadrangularis, *Wall.*, F.B.I.—645. *K&ndvel, Chaudhdri.* Bhownagar.
"V. repens, TF. *Sf A.*, F.B.I.—1-646.
V. discolor, *Dalz.f* F.B.I.—I 64(5. W. Ghâts, widely. Oot.-Dec
V. pallida, *W $ A,*, F.B.I.—1-646. Kilkund, N. Kanara. Oct.
V. glauca, TF. <J- A, F.B.I.—1-647. Karwar. August.
V. gigantea, . 5 ^ . , F.B.I.—1-648. *Gernul.* Bowdhan near Pooaa. June.
V. Tepanda, TF. ^ *A.*, F.B.I.—1-648. Bowdhan near Poona, Kudra, N. Kanara. *Talbot.* May-No*.
V. adnata, *Wall.*, F.B I.- -1-649. Badami. August.
V. Linnaei, *Wall.*, F.B.T.—1-649. Kudgal, N. Kanara Jan.
V. erioclada, TF. *$ A.*, F.B.I.—1-651. W. Ghâts. August.
V. latifolia. *Boxb.*, F.B.I.—1-652. Cultivated.
V. vinifera, *Linn.*, F.B.I.—1-652. *DrdJcshaveL* *Khajgolichavel.* Deccan, widely. July-August.
V. setosa, *Wall.*, F.B.I.—1-654. Deccan, widely. August.
V. carnosa, *Wall.*, F.B.I.—1-654. *Ambatvel.* Sirsi, Kumta Road, Mahableshwar. May-Oct.
V. elongata, *Wall.* rf.B.i.—1-658. On rocks, sea-shore, Bombay, Deccan. March.
V. auriculata, *Boxb.*, F.B.I —1-558. Godhali, Karwar. March-August.
V. tenuifolia, *W. & A.*, F.B.I.—1-658.
V. lauceolaria, *Boxb.*, F.B.I.—1-660. Matheran.

3. *Leea.*

L. macrophylla, *Itoxb.*, F.B.I.—1-664. *Dindd.* W. Ghâts. August.
L. aspeia, *Wall.*, F.B.I—1-665. KarwaT. August.
L. sambucina, *Willd.*, F.B.I.—1-665. *Karkani.* W. Ghâts and Deccan hills. August.

XLIV.—SAPINDACEJE.

1. *Cardiosjpermwn.*

C. Halicacabum, *Zinn.*, F.B.I.—1-670. *Kamphuti.* Near Bombay, Deccan hills. December.

2. *Semigyrosa.*

H. canescens, *Thwates*, F.B.I.—1-671. *JCarpd.* Matheran, Diggi Ghât. Feb. -April.

4. *Erioglossutn.*

E. edule, *Blume*, F.B.I.—1-672. Girganm, Bombay. Planted.

5. *Allophylus.*

A. oobbe, *Blume*, F.B.I.—I-673. *Tipdni.* Matheran, Lanauli. May-August •

8. *Cupania.*

C. (Blighia) sapida, *an.*, B.F. SUPP—13. *Akee* tree. Planted at Parel and in Lanauli wood. In fruit. March.

11. *ScJileichera.*

S. trijuga, *Willd.*, F.B.I.—1-681. *Kushimbo.* Khandalla, Sirsi. February-May.

13. *Sapindus.*

S. trifoliatus, *Linn.*, F.B.I.—1-682. *Bit ha.* Londa, Ainshi, N. Kanara, Oct.-November.

15. *Nephelium.*

N. Lit-chi, *Camb.*, F.B.I.—1-687. The Litchi. Cultivated in gardens rarely.
N. longana, *Camb.*, F.B.I.—1-688. Mahableshwar. March-April-

17. *Harpullia.*

H. cupanoides, *Boxb.*, F.B.I.—1-692. Near Poona, N. Kanara. *Talbot.* Nov.-Jan.

21. *Dodonoea.*

D. viscosa, *Linn.*, F.B.I.—1-697. *Jakhmi*, Badami, Dharwar, Sind. Widely planted as a fence. November.

23. *Turpinia.*

T. pomif era, D C , F.B.I..—1-698. Konkan and N. Kanara. *DeCrespigny.* Jan.

XL VI.—ANACARDIACEJE.

1. *Bhus.*

B. "Mytotensis, *Heyne*, V.BJ.—11-9. *Amonù* Hills near Poona. June.

3. *Mangifera.*

M. indio$_a$,Z»»».,*.B.i.-II-13. *Amhd.* The Mango. Wild and cult. Jan.-Feb.

3 *Anacariium.*

A. occidental* *Linn.*, F.B.I.-II-20. *Kdjv,.* Naturalised and cultivated, southern districts. Jan.-Feb.

6. *Buchanania.*

B. latifolia, i?o*6, S.B.I-11-22. *Char.* Dang. Singhur, Poona, Pal forests. Peb-Mar.

12. *Odina.*

O. Wodier,2?o^.,i?.B.i.-II-29. *Moya, Shimti.* Kajkot, Bowdhan, Poona. June.

14. *Semecarpus.*

S. Anacardium, Xm»., I.B.I.-11-30. *Bibbd, BhiUva.* Sonapur, Singhur. July.

16. *Hbligarna.*

H. Arnottiana, *Booh, f.*, *.B.I._IT-36. *Hoolgeri.* Divimaua, Kalare, Mysore border. Feb.
H. ferr$_n$ginea,JlfarcA,F.B.i.-II.37. Ha'^kutt,, *Young.* March.
H. Grahamii, *Hooh.f.,* F.B.I.-II-37. *Bibbddd.* Kbandalla. July.

18. *Nothopegia.*

N. Colebrookiana,JW««$_e$,F.B.T.-H.40. *Amberi.* Divimana Ghât. Feb.

20. *Sjpondias.*

S. mangifera, *Willd.*, P.B.I.-TI-42. *Ambddd.* Guzerat, widely planted.

21. *Dracontomelwn.*

D.$_{mang}$iferum,iH«»*,s.B.i.-II-43. Hewx-a, planted. April.

SCLEBOCAETA (i&w£E *African).*

S.caffra. Introduced tree. Planted, Poona. March.

XLV1TI.——MoBINGBiE.

1. *Moringa.*

M. pterjgosperma, ^ a e ^., F.B.I.-II-45. *Shevgd.* Widely planted. Jan.-Apr.
M. concanensis, *Nimmo.*, r.B.i.-II.45. DifEerB from above only in its larger leaflets ; it is probably the wild form of M. pterygosperma. Bodeh, Guxerat. Apríl.

PART III.

XLIX.—CONNARACE-B.

2. *Rourea,*

R. santaloides, *Woa.*, F.B.I.-II-47. *Vardhdrd.* Castle Eock, Yellapur, Miradongar Pen. Oo.

4. *Connarua.*

C. monocarpus, *Linn.*, F.B.I.—II-50. *Sundara.* Amboli Ghat, Marmagoa. Dec.-Jan.
C. Wightii, *Hook. f.*, F.B.I.—II-51. Potolli, N. Canara, *Talbot.* Feb.

L.—LEGUMINOS-E.

3. *Rothia.*

B. trifoliata, *Pers* , F.B.I.—II-63. Burhanpur, Badami, S. M. Ry. Aug.-Oct.

5. *Lotononis.*

L. eobordea, *Benth.*, P.B.I.—11-64. Sebwan, Sind. Dec.

6. *Heylandia,*

„ ^ „ „ Deccan, widely. Feb.-Jane.
H.latebrosa, 2)C.,F.B.I.—11-65. *Godhadu*

8. *Crotalaria**

Abmedabad, Mirpur Khas, Sind. Dec.-Feb.
C. Burnia, Saw., F.B.I.—11-66. *(xhagarz.* Abmednagar. Oct.-Deo.
C. filipes, *Benth,* r.B.x.—11-66.

C. Stocksii, *Benth.*, P.B.I.—11-67. Jambulpada, Colaba District. Oct.
C. vestita, *Baker*, F.B.I.—11-67. Khandalla, Mahableshwar. *Mg>*
C. prostrata, *Roxb.*, F.B,I.—11-67. Yellapur, *Talbot.* Oct.
C. bifaria, *Linn*, F.B.I.—11-69. Badami. November.
C. pusilla, *Hyne*, F.B.I.—11-70. Badami, Dharwar. Oct.
C. mysorense, *Roth.*, P.B.I.—11-70. Dakor, Guzerat. Pec-
C. triquetra, *Dalz.*, F.B.I.—11-71. Vingnrla. Oct.
C. albida, *Eeyne*, P B.I.—11-71. Hoosungada, Konkan. Dec-Feb.
C. nana, *Burm.*, T.B.I.—11-71. Mahableshwar. Sep.-Oct.
C. linifolia, *Linn.*, F.B.I.—11-72. Poona. Sep.
C. calycina, *Schrank*, P.B.I.-^II-73. Poona. Oct.
C. lutescens, *Dalz*,, F.B.I.—11-74. Castle Rock, W. Ghâts. Oct.
C. retusa, *Linn.** F.B.I.—11-76. *Culcula.* Jenr. Dec-Jan-
C. seiicea, *Retz.*, F.B.I.—11-75. Gund, N. Kanara. Jan.
C. Leschenaultii, *DC*, F.B.I.—11-75. *Dingld.* W. Ghâtp, widely. Sep.-Jan.
C. vcrrucosa, *Linn.*, F.B.I.—11-77. Vingurla. Nov.
C. leptostachya, *Benth.*, F.B.I.—11-78. Khandalla. Oct.
C. jnncea, *Linn.*, F.B.I.—11-79, *Tdg.* Cultivated widely. Sep.-Jan.
C. madurensis, *Wight*, F.B.I.—-11-79. Knmta-Sirsi Road. Dee.
C. f ulva, *Roxb.*, F.B.X.—11-80. Kumta-Sirsi Road. Feb.
C. ramosissima, *Roxb.*, F.B.I.—11-80. Badami. Dec.
C. medicaginea, *Lamh.*, F.B.I.—11-81. Baroda.
C. orixensis, *Rottl.*, F.B.I.—11-83. *Andabail, Jensrue.* Poona. Oct.
C. stiiata, *DC*, F.B.I.—11-84. Poona. Nov.

12. *Trigonella.*

T. occulta, *Del.*, F.B.I —11-87. Lananli. Jan-
T. Foenum-Graecum, *Linn.*, F.B.I.—11-87. *Methi.* Fennugreek. Cultivated.

13. *Melilotus.*

M. parviflora, *Desf.*, F.B.I.—11-89. *RanmethL* Poona, weed in fields. Jan.

14. *Medicago.*

M. lupulina, *Linn.*, F.B.I.—11-90. Sehwan, Sind. March.
M. denticulata, *Willd.*, F.B.I.—11-90. Sell wan, Sind. March.
M. sativa, *Linn*, *Lucerne* (vilaiti ghâs). Cultivated.

15. *Lotus.*

L. corniculatus, *Linn.*, E.B.I.—11-91. Sind. March.
L. Garoini, *DC*, F.B.I.—11-91. Poreb under. Dec.

16. *Cgamopsis.*

C. psoialeoides, *DC*, F.B.I.—11-92, *Gawar*, Cultivated.

17. *Indigofera,*

I. ochinata, *Willd.*, F.B.I.—11-92.
I. linifolia, *Retz.*, F.B.I.—11-92. *Pandarfali.* Deccan, Guzerat, Sind, widely. Aug.-Dec.
I. cordifolia, *Heyne*, F.B.I.—11-93. *Godadi.* Poona, Pnran, Sind. Aug.-Dec.
I. triquetra, *Dalz.*, F.B.I.—11-93. *BechJca.* Panchgani. Aug.-Sep.
I. glandulosa, *Willd*,, F.B.I.—1-94. *Barbadd.* Deccan. Aug.-Dec.
I. trigonelloides, *Jaub. Sf Spach.*, F.B.I.—11-94. Sind.
I. enneaphylla, *Linn.*, F.B.I.—11-94. *Bhuigulu* Bijapur, Badami. Oct.
I. uniflora, *JEamilL*, F.B.I.—11-94.
I. pentaphylla, *Linn.*, F.B.I.—11-95, Badami. Aug.
I. tenuifolia, *Bottler.*, F.B.I.—11-96. Sind, Badami. Oct.
1. trifoliata, *Linn.*9 F,B.I.—11-96. Parel, Chiplun. Sep.-Oct.
I. sp. Jowada, Dang, in ripe fruit. Feb.
I. trita, *Linn.* /., F.B.I,—11-96. Poona. March.
I. paucifolia, *Del.*, F.B.I.—11-97. Baroda, Dakor, Sind. Dec.
I. endeoaphylla, *Jacq.*, F,B.I.—11-98. Pancbgani. Oct.
I. birsuta, *Linn.*, F.B.I.—11-98. Badami. Nov.
I. argentea, *Linn.*, F.B.I.—11-98. *Karunilu* Poona, Sind. Nov.-Dec.
I. tinctoria, *Linn.*, F.B.I.—11-99. *Nil, gulu* Cultivated. Nov.-Dec.
I. pulchella, *Roxb.*, F.B.I.—II.-101. *Baroli, halhathi.* Near Mahableshwar. Aug.-Dec.
I. anabaptista, *Steud.*, F.B.I.—11-102. Mulier,Sind. Feb.
It constricta, *Trin*, N. Kanara. Isov.

18. *Pseralea.*

P. corylifoH?, *Linn*,, T.B.I.—11-103. *Bavchu* Decoan, widely. Aug.-Dec.

20. *Milletia.*

M. racemosa, *Benth.*, F.B.I.—11-105. Planted, Poona. Dasgaon, Konkan, in fruit. Oct.

21. *Mundulea.*

M. suberosa, *Benth.*, F.B.I.—11-110. *Supti.* Gokak. Oct.

22. *Tephrosia.*

T. tenuis, *Wall.*, F.BJ.-IH11. Konkan, widely. Oct.
T. tinctoria, *Pers.*, F.B.I.—11-111. Konkan, widely. Oot.
T. senticosa, *Pers.*, P.B.I.—11-112. Jeur. Feb.
T. purpurea, *Pers.*, F.B.I.—II.-112. *Unhali. Sarpunkha.* Deccan, Guzei-at. Oct. -Jan.
T. villosa, *Pers.*, F.B.T.—11-113. Badami. Aug.
T. pauciflora, *Grah.*, F.B.I.—11-114. Hills at the Hub river, Karachi. Jau-

23. *Sesbania.*

S. aegyptiaca, *Pers.*, F.B.I.—11-114. *Shevri.* Cultivated.
S. aouleata, *Pers.*, F.B.I.—11-114. *Banshevri.* Deccan, Konkan, widely, in wet places. Sep.-Oct.
B. grandiflora, *Pers.*, F.B.I.—11-115. *Agastd, Hadgd.* Cultivated generally.

26. *Astragalus.*

A. contortuplicatus, *Linn.*, F.B.I.—11-122. Hyderabad, Sine!. May,
A. Stocksii, *Beth.*, Boiss. Fi. Or.—11-492. Kirthar Mountains, H. E. M. James

28. *Tavernierom*

5. nummularia, *DC,* F.B.I.—11-140. *Jethmad, Jéshthamadh.* Chatarsinghi near Poona. Dec.

30. *Geissapsis.*

G. cristata, *W. 8f A,* F.B.I.—11-141. Khandalla. Oct.

Arachis.

A. bypogea, *Linn., DC* Prod.,—11-471. *Bhuimug.* Earth Nut, Cult.

33. *Alhagi.*

A. maurorum, *Lour*,* F.B Z.—11-145. *Javasd, Yavasd.* Sind, widely. March.

36. *Zornia,*

Z. diphylla, *Pers.*, F.B.I.—11-147. *Ldndgů.* Poona. Aug.-Ssp.

38. *Smithia.*

S. sensitiva, *Ait.*, F.B.I.—11-148. *Kavld.* Matheran, W. Ghats, Bombay. Sep.-Oot.
S. geminiflora, *Botlu,* F.B.I.—11-149. Malwan. Dec.
S. purpurea, *Hook.*, F.B.I.—11-149. *Burk&r** Lanauli. Sep.-Dec.
S. setuiosa, *Dalz.*, F.B.L—II-149. Mahableshwar. Sep.-Dec.
S. bi^emina, *£alz.*9 F.B.I.—11-149. *BurJcee.* Mahableshwar. Sep.^Deo.
S.capitata, *Dalz.*, F.B.I.—11-150. Siddu Gandi. Sep.
S. pycnantha, *Benth.*, F.B.I.—11-150. Kanara.
S. blanda, *Wall.*, F.B.I.—11-151. Mahableshwar. Sep.-Oct.
S. blanda racemosa, F.B.I.—11-151. Sirsi, N. Kanara. Sep.

39. *JEschynomene.*

M. indica, *Linn,,* F.B.I.—11-151. Kolhapur, Poona. Aug.-Dec.
.33. aspera, *Linn.*, F.B.I.—11-152. *Bhend.* Hangal, Dharwar.

40. *Ormocarpum.*

O. sennoides, *DC,* F.B.I.—11-152. *Kadunugge.* Marshy fields, Marmagoa. Dec.

43. *Eleiotis.*

E. sororia, *DC,* F.B.I.—11-153. Badami," Dharwar. Oct.

43. *Pycnosport**

P. hedysaroides, R. Br., F.B.I.—11-153. Vingurla. *Dalzell.* Dee.

44. *Pseudarthria.*

F. vkcida, *W.* & *A.*, F.B.I.—11-153. Vingurlft. Nov

46. ***TJraria.***

U. picta, *Desv.*, F.B.I.—11-155. ***Prishniparni Pithvan.*** **Bombay. Sep.**

47. ***Alysicarpus.***

A. monilifer, *DC,* F.B.I.—11-157. **Badami, Bbanapnr, Dhai-war. Oct.**
A. bamosus, *JEdgw.*, F.B.I.—11-157. **Fadami. Oct.**
A. vaginalis, DC., F.B.I.—158. **Konkan, Deocan, Gnzerat. Oct.**
A. bnpleurifolius, *DC,* F.B.I.—11-168. **Near Matheran, Bombay, May-5ep.**
A. longifolius, *W. & A.*, F.B.I.—11-159. ***Shevra Gamli.*** **Poona, Matoocga. Sep»**
A. rugosus, *DC,* F.B.I.—11-159. **Dakor, Poona. Oct.-Nov.**
A. tetragonolobus, *Edgio.*, F.B.I.—11-159. **Poona, Xaga. Aug.**
A. pubescens, *Law.*, F.B.I.—11-159. **Bill near Poona. Bircby. Sep.-Nov.**
A. belgaumensis, *Wight,* F.B.I.—11-159. **Belgaum district. Mabableshwar, Sep.**

49. ***Ougeinia.***

O. dalbergioides, *Benth.*, F.B.I.—11-161. ***Tivas.*** **Hills near Poona. Feb.**

50. ***Desmodium.***

D. umbellatum, Dec, F.B.I.—11-161.
D. cepbalotes, *Wall.*, F.B.I.—11-161. **Near Matberan. Sep.**
D. pulcbellum, *Benth.*, F.B.I.—11-162. **N. Kanara. Oct.**
D. triqnetrum, *DC,* F.B.I.—11-163. ***Mand.*** **Castle Rook, W. Gbats. Nov.**
***D.* laxiflorum, *DC,* F.B.I.—11-164.** **Eoosagaon, near Poona. Oct.**
D. gangeticum, *DC,* F.B.I.—11-168. ***Salvan.*** **Bhowdhan, Poona. Aug.**
D. latifolium, *DC,* F.B.I.—11-168. **Kerawati, Dharwar. Oct.**
D. diffusum,DC, F.B.I.—11-169. ***Chikta.*** **Poona. Sep.**
D. polyoarpum, *DC,* F.B.I—11-171. **Castle Rock, Yellapnr, N. Kanara. Oct**
D. rotnndifolium, *Baker.*, F.B.I.—11-172. **Mabableshwar. Nov**
D. parviflorurn,*Baker.*, F.B.I.—11-172. **W. Gbats. Oct.**
D. triflorum, DC, F.B.I.—11-173. ***Ranmethi.*** **Deccan, widely. Oct.**

51. ***Abrus.***

A. preoatorius, *Linn.*, F.B.I.—11-175. ***GunJ.*** **Guzerat, Konkan, Deccan bills. Oct.**

52. ***Cicer.***

C. arietinnm, *Linn.*, F.B.I.—11-176. ***JIarbara.*** **Grain.** **Cultivated. Dec.**

53. ***Vicia.***

V. sativa. *Linn.*, F.B.I.—11-178. ***Mutaree.*** **Poona, in gardens. "Feb.**

54. ***Lathyrus,***

L. Bativus, *Linn.*, F.B.I.—11-179. ***Lakh.*** **Cultivated.**

Tisum.

P. sativnm, *Linn9 Matar.* **Garden Pea.** **Cultivated-**
P. arvense, *Linn.*, *Kalavatana.* **Field Pea.** **Cultivated.**

56. ***Shuteria.***

S. vestita, *W. 8f A9t* F.B.I.—11-181. **Poona, Dbarwar. Oct.**

57. ***Dumasia.***

D. villosa, DC, F.B.I—11-183. **Mabableahwar. Nov.**

58. ***Glycine.***

G. javanica, *Linn.*, F.B.I.—11-183. **Pala, N. Kanara. NOT.**
G. pentapbylla, *Dalz.*, F.B.I.—11-184. **Yellapur. Ang.**

59. ***Teramnus***

T. labialis, *Spreng.*, F.B.I.—II-184. **Deccan, widely. Aug.-Nov.**

60. ***Mucunct.***

M. monosperma, *DC,* F.B.I.—11-185. **Kanara. Feb.**
M. pruriens, DC, F.B.I.—11-187. ***Khaj-Kuiri.*** **W. Gbats, widely. Aug.-Dcc**

62. ***Erythrina.***

E. indioa, *Lam.*, F.B.I.—TT-188. ***Bangara**** **Sea coast.** **Planted widely. March.**
E. etricta, *Both.*, F.B.I.—11-189. **SiDghur Hills, Poona, Elephanta. Feb.**

E. suberosa, *Boxb.*, F.B.I.—11-189. Ohakan, Poona District. April.
JE. crista-gBlli, *Linn,, DC,* ProcZ.—11-413. In gardens. March.
E. aborescens, *Boxb.*, F.B.I.—11-190. Planted, Poona, Feb.-March.

64. *Grona.*

G. Dalzellii, *Baker,* F.B.I.—11-191. Panchgani, Mahableshwar. Oct

65. *Galactea.*

G. tenuiflora, IF. *$ A.t* F.B..I—11-192. Deccan hills, widely. June-Oct.

67. *Spatholobus.*

S. purpurens, *Benth.*, F.B.I.—11-194. Diggi, N. Kanara. May.
S. Roxburghii, *BentJi.*, F.B.I.—11-193. *Palas wel.* Pulsan, Peiat. *Feb.*

68. *Butea.*

B. frondosa, *Boxb.*, F,B,i,—11-194, *Palas.* Gueerat, Konljan, widely. Feb. March.
B. superba, *Boxb.*, F.B.I.—11-195. N. Kanara. Feb.

70. *Cnnavalia**

C. ensiformis, *DC,* F.B.I.—11-195. *Abai.* Deccan hills, widely. Aug-Oct.
C. Stocksii, *Dalz.*, F.B.I.—11-106. Mahableshwar. Sep.

72. *Bueravia.*

P. tuberosa, *DC,* F.B.I.—11-197. *Boicoila. Bendarcoil.* Konkan, Dang. Feb.

73. *JPhaseolous.*

P. lunatus, *Linn.*, F.B.I.—11-200. *Lobiya.* Cultivated.
P. vulgaris, *Linn.*, F.B.I.—11-200. *Loba.* The Kidney Bean. Cultivated.
P« semierectus, *Linn.*, F.B.I.—11-201. Hyderabad, Sind. Wild? Oct.
P. trilobus, *Ait.*, F.B.I.—11-201. *Mwkni.* Deccan, Gnzerat. Oct.
K aconitifolius, Jircy.—F.B.I.—11-202. *Math, Matki.* Cultivated.
P. grandis, DaJs. *Sf Gibs.*, F.B.I.—1^202. Panchgani. Sept.
P. pauciflorus, *Dalz.*, F.B.I.—11-202. S. Konkan, *Dalz.*
P. Mungo, *Linn.*, F.B.I.—11-203. *Mug.* Cultivated.
P. trinervius, *Heyne,* F.B.I.—11-203. W. Ghats, Mahableshwar. Sept.

74. *Vigna.*

V. Oatiang, *JEndL,* F.B.I.—11-205. *Chauli.* Cultivated.
V. vexillata, *Benth.*, F.B.I.—11-206. Halaunda, M'war, Panchgani, W. Ghats. Oct..

75. *Fachyrhizus,*

I*, angulatus, *Rich.*, F.B.I. —11-207, The Yam Bean. In gardens rarely.

76. *Clitoria.*

0. ternatea, *Linn.*, F.B.I.—11-208. *Gokran, GokarnL* June-Jan*
<^ biflora, *Dalz.*, F.B.I.—11-208. Konkan. Sept.

77. *Dolichos.*

D. Lablab, *Linn.*, F.B.I.—11-209. *W&l p&pađt, FAvtd.* Cultivated.
I>. bracteatus, *Baker,* F.B.I.—11-210. * Konkan, *Stocks**
D. biflorns, *Linn.*, F.B.I.—11-210. *Kvlith, Hulga.* Cultivated.

78. *jPsophocarpus.*

^ tetragonolobus, *DC,* F.B.I.—11-211. *Chaudhtri, Ghevda.* Cultivated.

79. *Atylosia.*

A- geminiflora, *Dalz.*, F.B.I.—11-212. *Tulsi Dam.* In fruit. May.
A. lineata, *W. $ A.*, F.B.I.—11-213. *Bantur.* Matheran. Dec.
A. sericea, *Benth.*, F.B.I.—11-213. Mahableshwar. Oct.-Jan,
A. mollis, *Benth.*, F.B.I.—11-213. Konkan, *Stocks, DalzelL*
A. kulnensis, *Dalz.*, F.B.I.—11-214. Potolli, *Talbot.* Kulnawari. Jan.
A- scarabsBoides, *Benth.*, F.B.I.—11-215. * Poona, Goa. June-Oot
A- rostrata, *Baker,* F.B.I.—11-216. Konkan. *Stocks**

80. *Cajanus.*

C. indious, *8preng.9* F.B.I.—11-217. *Tur.* Cultivated.

82. *Cylista.*

C. scariosa, *Ait.*, F.B.I.—11-219. *Eanghevda.* — Western India, widely. Feb.

84. *Bhynchosia.*

R. aurea, DC., F.B.I.—11-221. — Badami. Nov.
R. cyanosperma, *Benth.*, F.B.I.—11-222. — Hirdosee Anmode, N. Kanara. Oct.-Jan-
R. minima, *DC*, F.B.I.—11-223. — Deccan, Guzerat, widely. Sep.-Jan·
R. minima, *DC*, war. F.B.I.—11-223. *Laxiflora.* — Badami. Aug.
R. Memnonia, J>C., F.B.I.—11-224. — Karachi. Oct.

85. *Flemingia.*

F, strobilifera, 22. .Br., F.B.I.—11-227. *Banjanja.* — Matheran. Jan.
F. congesta, *Boxb.*, F.B.I.—11-228. Doio *Dowla.* — Vingurla. Dec.
F. Wallichii, TF. $• 4., F.B.I.—11-229. — Kanava. *Veb.*
F. involuorata, *Benth.*, F.B.I.—11-229. — Dandeli, N. Kanara. Jan.
F. vestita, *Benth*, F.B.I.—11-230. — Bababooden Hill, *Talbot.* Oct.
F. tnberosa, *Dalz.*, F.B.I.—11-230. — Konkan, *Stocks, Dal*ell.*

86. *Dalbergia,*

D. Sissoo, *Boxb.*, F.B.I.—11-231. *SUsvi.* — Planted. April-May.
D. latifolia, *Boxb.*, F.B.I.—11-231. *Sisu, Sisham.* — Deccan bills. Wagbai Dang. Aug.
D. Stocksii, *JBenth.* F.B.I—11-234. — Konkan, *Stocks.*
D. sympathetica, *Nimmo*, F.B.I.—11-234. *Petgúl.* — Yakambi. Feb-
D. tamarindifolia, *Boxb.*, F.B.I.—11-234. — Nilkand, N. Kanara. March.
1). lanceolaria, *Linn.*, F.B.I.—11-235. *Dandus.* — Alandi, Mundgode. April.
D. volubilis, *Boxb.*, F.B.I.—11-235. *Alai.* — Khandalla. Feb-
D. paniculata, *Boxb.*,F.B.I.—11-236. *Phansa.* — Pasaringi Kalghatgi Taluka. *Talbot.* April*
D. monosperma, *Dalz.*, F.B.I.—11-237. — Malvan. *JDalz.* June.

87. *Pterocarpus.*

P. indicus, *Willd.*, F.B.I.—11-238. — Khatriz Ghât, near Poona. Oct.
P. marBnpium, *Boxb.*, F.BJ.—11-239. *Bibla.* — Yellapnr, N. Kanara. Nov.

88. *Pongamia.*

P. glabra, *Vent.*, F.B.I.—11-240. *Karanj.* — Konkan* widely planted. April.

89. *Derris.*

D. scandens, *Benth*^ F.B.I.—11-240. *Mota Sirili.* — Karwar. July.
D. ulginosa, *Benth.*, F.B.I.—11-241. *Kajarvel.* — Mumbra, near Bombay. Feb.
D. oblonga, *Benth.*, F.B.I.—11-242. — Konkan. *Stocks.*
D. brevipes, *Baker*, F.B.I.—11-244. — Konkan. *Stocks.*
D. Heyneana, F.B.I.—11-244. — Konkan. *Stocks,* Law.
D. canarensis, F.B.I.—11-246. — Konkan* near Garsnppa, *Dalzell.*

92. *Sophora.*

S. tomentosa, *Linn.*, F.B.I.—11-249. — Gardens, Poona.

96. *Caesalpinia.*

C. Bonducella, *Flem.*, F.B.I.—11-254. *Sagorgota.* — *Kaski,* Deccan hills. July-Sept.
C. Nnga, *Ait.*, F.B.T.—11-255. — Rntnagiri. Jan.
C. Sappan, *Linn.*, FB..I— 11-255. *Patang.* — Planted. Poona. Sept.
C. pulcherrima, *Swartz*, F.B.I.—11-255. *Sank&sur.* a — Gardens, all the year.
C. sepiaria, *Boxb.*, F.B.I.—11-256. *Chilhar.* — Poona, Nasik. ApT)l-Dec.
C. mimosoides, F.B.I..—11-256. — Castle Eook, W. Ghats. Nov.-Dec.
C coriaria, *Willd.*, *DC*, Prod.—11-483. — *Libi BibL* Planted. Poona, Dharwar. Oct.

Hcematoxylon (Central America).

H. campeaohianum, *Linn.*, D C , Prod.—11-485. — *Logwood.* Planted.

98. *Mezoneicrum.*

M. cucullatum, *W. Sf A.*, F.B.I.—11-258. *Jkaghi.* — Lanauli. Match.

100. *Poinciana.*

P. elata, *Linn.*, F.B.I.—11-260. *Sankesvar.* — Planted, Poona, Bijapur, near Mahomedan tombs.
P. regia, *Bojer*, F.B.I.—11-260. *Gul mohor.* — Planted. April.

101. *ParUnsonia* (Central America).

P. aculeata, liwn., B.B.I.—11-260. *Vedi Babul.* — Poona. Naturalized. Jan.-Mar.

102. *Wagatea.*

W.8pioata,2)^.,r.B.i.-II.26!. *Vagati.* Fitzgerald Ghât. Jan.

103. *Cassia.*

C. fistula, *Linn.*, F.BX-II.261. *Bhava, Pahva.* W. Ghats, Deccan hills. Widely planted' March.

C.manggmata^6T.iH262. *Umidi, Uskaimen* *l**f Poona' / ^ f Planted. Poona.

C. grandis, *Linn.f.*, *DC*, Prod.-II.489. Poona. Jan.-Mar.

C. occidentals, *Linn.*, F.B.I.—11-262. *Kashinda.* uaaatin Nor Jan

C. sophera, Ziaw., F.B.I.-II-262. JiuyZt Zbtta. Deccan. Nov.-Dec.

C.Tora,Z^.,r.B.i^II-263. *Takla.* Gardens, Jan.-Mar.

C. tomentosa, *Linn.*, F.B.I.-II-263. ^eccan widely. Jan.-July.

C.auriculata,i^.r.B.i^II-263. *Tarvad. Awal.* Hyderabad, Sind, ..ijapur, Poona. Nov.-Feb.

C. obovata, *Collad.*, F.B.I.-.II-264. *Bhui-tarvad.* Gardens, Poona. Oct.

C. alata, Zia«., F.B.I.—11-264. *Simay Agasay.* Planted An^.May.

C. slamea. *Linn.*, r.B.i.-II^. *Kasid.* ..eeu Collem and ^ Bo^k< Oct.

C. montana, Jffe^^, F.B.I.—11-264. unaii DWiW Poona< Aug.-Mar.

C. glauoa, iaw., F.B.I.-II-265. *Jfetka Tarvad.* paw^Konkan. Poona. Sep.

C. Absus, *Linn.*, F.B.L—II-265. ' Dhulia, Badami. Aug.

a pumila, *Lam.*, F.B.I.-II-265. Jambholpada, Colaba. Oct.

C. Kleinii, *W. $ A.*, F.B.I.-11-265. PooDa> Poladpur, Konkan. Sept.

C. mimosoides, *Linn.*, F.B.I.—11-265.

104. *Cyanometra.*

C. ramiflora, *Linn.*, F.B.I.—11-267. N> Kanara. *Talbot.*

107. *JSardwickea.*

H. binata, *Boxb.*% F.B.I.—11-270. *Aejan.* Lulling Pass, Dhulia.

109. *Saraca.*

S. indiea, *Linn.*, F.B.I.-H-271. *Ashoh* W. Ghats; widely. Oot.-Mar.

111. *Tamarindus.*

T.indicu8,Zm».,F,B.i.-H-273. *Chinch. Ami.* Peint Taluk. Deccan. May-June. The Locust Tree. In gardens.

T. siliquu, *Linn.*, *DC*, Prod.-II.486. *Meccam Amh.*

114. *BauMnia.*

B. tomentosa, *Linn.*, F.B.I.—II-275. Indig? Widely planted. Jan.-Dec.

B. acuminata, *Linn.*, F.BJ.—11-276. ° Planted. July.

B.racemosa,/,*»»., S'B.i.—11-267. *Jpta.* Decoan ; widely. Hay.

B. malabarica, *Boxb.* F,B.I.— 11-277. Bansda, in fruit. Feb.

A tree near 3rd milestone, Naiel.

B. Lawii, *Benth.*, F.B.I. *amollee.*

Matheran Road. 1S2^ F.B.I.—11-278. duka. Legume woody, 9"×1"×¼" twisted green or red tomentose.

Planted. Poona, Konkan, *Stocks.*

Konkan Ghâts. April.

Deccan forests.

B, purpurea, *Linn.*, F.B.I-H-284 *BuUaKanchin.* Planted widely.

B. yariegata, *Linn.*, M.I.-IL-S84. *Kanchin.* p<jint tftluk#

B. ep. Inc. *Boot chamail.*

115. *Neptunia.*

N. oleracea, *Lowr.*, F.B.I.,—11-286. Halial, N. Kanara, 2^Wofc Oct-

N. triquetra, *Benth.*, F.B.I.—11-286. Ahmednagar, Surat. Oct

116. *Xylia.*

X. dolabrifonnis, *Benth.*, F.B.I.-II-286. *Jamba.* N. Kanara.

117. *Entada.*

E. scandens, *Benth.*, F.B.I.—II-287. *Garambi.* Lanauli wood. Sirai-Kumta Road, N. Kanara. Apr.-May.

118. *Adenanthera.*

A. pavonma,Zi««.,F.B.i.-II.287. *Batangunj.* Planted. May.

119. *Prosopis.*

P. « Tinn F.B.I.—II-288. *Shami, Saundad, Sumari.* Poona, Deccan, Guzerat. Dec.-Feb. Goga.

P. Stephaniana, *Zunth.*, F.B.I.—H-283.

120. *Dichrostachys.*

D. cinerea, TT. * *A.*, M A - M88. *Sigun, Kati.* Poonr^ Badami. Jeur. Sep.-Oot.

122. *ParJcia.*

P. bigiandulosa, *W. $ A.*% F.B.I.—11-289. *Chenduphul.* Planted. Dec-

123. *Desmanthus.*

D. virgatus, *Willd.*, F.B.I.—11-290. In gardens. Naturalized. June-July'

124. *Leucwna.*

L. glauca, *Benth.*, F.B.I.—11-290. *Kubabhal,* Foona ; widely in gardens. Sept.-Oct,

125. ' *Mimosa.*

M. pudica. *Linn.*, F.B.I.—11-291. *Lajalu.* Kumta Roadsides. Oct.
M. rubricaulis, *Lam.*, F.B.I.—11-291. *Arai.* Gardens. Aug.
M. hamata, *Willd.*, F.B.I—11-291. *Arlcar, Arati.* Deccan widely. Sept.

127. *Acacia.*

A. Farnesiana. *Willd.*, F.B.I.—11-292. *Devbabhal, Kankri.* Indig? Occurs widely. August-March.
A. planifrons, *W. Sf A.*, F.B.I.—11-293. *Salt.* The Umbrella Thorn. Planted. Poona. Nov.
A. arabica, *Willd.*, F.B.I.—11-293. *Babhal.* Deccan, Guzerat. Widely. June-Jan.
A. arabica, *Willd.*, F.B.I.—11-293, var. *BamTcanta.* Deccan, Guzerat. Widely. June-Jan.
A. arabica, *Willd.*, F.B.I.—11-293. var. *JSree Babhal.* Deccan, Guzerat. June-Jan.
A. eburnea, *Willd.*, F.B.I.—11-294. *Marmati.* Deccan. S. M. Country. Nov.-Feb.
A. Jacquemontii, *Benth.*, F.B.I.— *JRatobauli.* Ahmedabad. Feb.-May.
A. tomentopa, *Willd.*, F.B.I.—II 294. *Khairi.* Dangs. Dec
A. leucophlcea, *W%Ud>*, F.B.I.—11-294. *Sivar. Hewar.* Deccan, widely. Jan.-Feb.
A. sum a, *Kurz.*, F.B.I-—tt-294. *SonJeairi.* Konkan, Deccan. widely. May-July.
A. Catechu, *Willd.*, F.B.I.—11-295. *Ehair.* Deccan, S. M. Country, Guzerat. Augr.-Scp.
A. Sundra, *DC,* F.B.I.—11-295. Deccan. August.
A. ferruginea, *DC, Jehan KariJcara.* Pulsan, Peint Taluka Dang.
A. Senegal, *Willd.*, F.B.I.—11-295. Sind. *Stocks.* April
A. Latronum, *Willd.*, F.B.I.—11-296. *Devbhabal.* Deccan ; widely. Sept.-Nov.
A. concinna, *DC,* F.B.I.—11-296. *Shih kdi.* I>ecoan hills, N. Kanara. March-July-
A. Intsia, *Willd.*, F.B.I.—11-296. *Chilari.* , Deccan hills. Aug.
A. pennata, *Willd.*, F.B.I.—11-297. *Semba.* Deccan, Konkan hills. Feb.
A. Burkei, *Benth.* Anna tree of Damaraland. Planted. Poona. Jan.

A Balfourii, *Woodrow,* sp. nova. A middle-sized tree resembling the *babliul,* raised from seed collected in Socotra by Dr. Balfour of Edinburgh and naturalized at Poona.

Bark, rugged, brown; *lenticels* prominent on young branches.

Internodee.—Shorter than leaves.

Leaves.—\\" to 2'' X J" to *V ; leaflets* 10 pairs; *petiole* £", rachia with a gland below lowest and highest pair of leaflets ; *pinnules* 16 pair, yj" mucrouulatc.

Flowers.—Yellow ; *capitula* with £" to 1" peduncles, axillary, fasiculate.

Stipulary thorns.—|" to 1," strict, slender, white.

JBruit.—2" X lp subglobose, crustaceous, brown, glabrous, tardily dehiscent, with much pith and 6 to 12 s. *

Seeds.—¥ X * X £" each side with prominent channelled line, following outline interrupted at base, enclosing foveolate area.

This tree is closely allied to A. Farnesiana, *Willd.*, in the struoture of its crustaceous pithy pod.

128. *Albizzia.*

A. Lebbek, *Benth.*, F.B.I.—11-298. *Shiras.* Deccau hills. Planted widely. Feb.-March-
A. odoratissima, *Benth.*, F.B.I.—11-299. *Siris.* Chinchada. Poona. Sirsi. April-May.
A. procera, *Benth.* F.B.I.—11-299. *KinJiai. Godhunchi.* • Poona. June.
A. lucida, *Benth.*, F,B.I.—11-299. Matheran.
A. stipulata, *Boiv.*,—F.B.I.—11-300. *Udal-phalari.* Fitzgerald Ghat. April-May.
A. amara, *Boiv*,, F.B.I.—11-301. *LalaL* Poona. May.

131. *Pithecolobium.*

P. duloe, *Benth.*, F.B.I.—11-302. *Walayeti Amlù* Planted widely.
P. bigeminum, *Benth.*, F.B.I.—11-303 *Kachlor.* Divimana, N. Kanara. Feb.
P. saman, *Benth.*, Lon. Jour. Bot.—11-423. Rain tree. Planted. Thana, Poona,

PART IV.

LI.—ROSACH.E.

3. Prunus.

P. AmygdaluP, *Baill.*, F.B.L-II-313. *Badam.* The Almond· In g ^ ^ rarely.
P. persica, *B. # M.f.* r.B.i.-II-313. *Alu.* The peaoh, QardfiM> Panohganî.

5. *Pygeum.*

P. Gardneri, *Hoohf.*, F.B.I.—11-321. Mabablesbwar. Nov.
P. Wightianum, *Bl.*, F.B I.—IL319. Divimana, N. Kanara. Nov.

8. *Rulus.*

R. moluceanus, *Linn.*, F.B.I.-II-33O. Western Ghàts. Southward. Oct.
R. lasiocarpus, *Smith*, F.B.I.-II-339. *Rajapuri.* Raspberry. Panchgani. May.
R. rossefolius, *Smith, B.C.*, F.B.I.—11-341. Gardens. Aug.

10. *Fragaria.*

F. indiea, *Andr.*, F.B.I.-11-343. Yellow-flowered Strawberry. Gardens, Baroda, Poona. Jan.-Mar.
F. vesoa, *Linn.*, F.B.I.—11-344. Strawberry. Gardens, Mahableshwar. Jan.-Apl.

11. *Potentilla.*

P. supina, *Lim** F.B.I.-II-359. Karnali Guzerat, Nov*

16. *Rosa.*

No species of this genus is indigenous, and the few widely cultivated species are doubtfully identified.

17. *Neurada.*

N. prooamben,, X., P.B.1.-II-368. HUls at the Hub river, Karachi. J.n.

17a. *Cydonia.*

a^lgMis, Pa™, *.B.I.-II-369. *Sihi.* The Quince. Kanted rarely. Mabable$_{9}$h$_{W}$ar.

19. *Eriobotrya.*

E. japomca, *Lindl.*, F.B.I.—H-37«« TheLoquat. Planted, Poona'

20. *Pyrus.*

P. Malus, *Linn.*, F.B.I.—II-373. The Apple. Planted, Panchgani, rawly
P. communis, *Linn*, F.B.I.—II-374. *Naspati.* The Pe' Cultivated^Mahableshwa,

LII.—Saxifragee.

3. *Valàia.*

V. viscofla, *Roxb.*, F.B.I.—11-399. Divale, 23 miles east of Ratnagiri. Jan.

LIII.—Crassulaceæ.

3. *Bryophyllum.*

B. caiycinum, *Salisti}**.!.*—11-413. *Panjhàrf.* Wai, Satara Dist. Jan.

4. *Kalanchoe.*

K. glandulosa, BbcAsf., F.B.I.—11-414. Singhad. Hills near Satara. Mar.
K. spatulata, D C , F.B.I.—11-414. Panchgani, Badami. Oct.-Nov.
K. floribunda, *W. 8f A.*, F.B.I.—II414. HiUs near Satara. Nov.
K. brasiliensis, *Camb.*, F.B.1.—11-415. Gokak, Panohgani. Oct.

LIV.—Droseraoe*.

1. *Drosera.*

D. Burmanni, *VaKl.*, F.B.T.—11-424. Siddapur, Yaoombi, N. Kanara. Jan.-Feb.
D. indica, *Linn.*, F.B.I.—11-424. Sawantwadi, Mahableshwar, Lanauli. Nov.

LVI.—Haloragee.

4. *Myriophyllum.*

M. inteime i$_{nm}$, DC'., P-B.I.—H-433. The Lake, Mahableshwar. Nov.

LVII.—Rhizophorem.

1. *Rhizophora.*

R. mucronata, *Lam.*, F.B.I.—II-485. *Doombee.* Hareshwar. Dee.

Z.Kandelia.

K. Rh««dii, TToa., WW--H-4W. Kamta. Mar.

4. *Bruguiera.*

B. parviflora, *Woa.*, F.B.I.—11-438. Karwar. Dec.

6. *Carallia.*

C. integerrima, *DC,* F.B.I.—11-439. *Panshi.* Marmagoa. Nov.

LVIII.—CoMBBETACEjE.

1. *lerminalia.*

T. Catappa, *Linn.*, F.B.I.—11-444. *Deshi badam.* Planted, Deocan, widely. Apl.
T. Belerica, *Roxb.*, F.B.I.—11-445. *Behada* Devale, Konkan. Apl.
T. Chebnla, *Bets.*, F.B.I.—11-446. *Hirdà.* Mahableshwar. Apl.
T. Arjuna, *Bedd.*, F.B.I.—11-447. *Kahu, Arjun, Arjunsadada.* Apl.-May.
T. tomentosa, *Bedd.*, F.B.I.—11-447. *Ain.* Hills near Poona. July-
T. paniculata, *Both.*, F.B.I.—11-448. *Kinjal.* Near Sirsi. Nov.-Dec

2. *Calycopteris.*

C. floribnnda, *Lamb.*, F.B.I.—11-449. *Vhshi.* Deccan Hills. Sept.-Oct.

3. *Anogeissus.*

A. latifolia, *Wall.*, F.B.I.—11-450. *Dhavda, Damora.* Deccan Hills, widely. July-Nov.

4. *Lumnitzera.*

L. racemosa, *Wild.*, F.B.I.—11-452. Katnagiri. Jan.

5. *Combretum,*

C. ovalifolium, *Boxb.*, F.B.I.—11-458. *Pilolka, Bokuryel.* Karli, W.Ghâts. Feb.
C. extensum, *Boxb.*, F.B.I.—11-458. *Piluki, Penit.* Khandalla. Jan.

6. *Quisqualis.*

Q. indioa, *Linn.*, F.B.I.—11-459. Eangoon creeper. *Bangoonacha vel.* Gardens. Mar.-Aug.

LIX.—MY BTACEJE.

4. *Psidium.*

P. Guyava, *Linn.*, F.B.I.—11-468. *Jamb, Pairu.* The Guava. Cultivated.

Myrtus.

M. oommnnis, *Linn., D.O. Prod.*—III-239. *Myrtle.* The Myrtle. Planted.

8. *Eugenia.*

KmaWsi.,Zi»n.ji..B.i.-n.471. Planted. Apl-May.
E.Jambos, Xi»».,p.B.i.-II^74. *Gulab Jamb.* Planted, widely. Feb.
E. hem.spher.oa, *Wight.* *-B.I-H-477. Ain8hi a Mt jJa,,.Apl.
E. laeta, *Bam.*, r.B.i.—11-479. w. Ghats. Noy.
E. memeoylifolia, *Talbot.*, Jour. Bom. Nat. Hist. Soo., Vol.—XI, 236. Kalpa. May-
B. toddaliodes, *Wight,* J.B.I—II.482. *Ceppa, Titpoli.* Castle Rock ,W. Ghats. Jan-
E. Wightiana„ *Wight,* ir.B.i.-II-485. Konkan, N. Kanara. *Stochs, Talbot.* Feb.-Mar.
Sawad, Kanara. Feb.

E. caryophyll^?M „ i -11-490. MarKagoa(M J S S C ^ X :
E. rubicunaa, #7^r^, F.B.I,—11-495. *LendiJambul.* Mar May.
E. Stocksi, *Duthie,* F.B.I.-II-498.
E. Jambolana, *Lam.*, F.B.I.—11-499. *Jambul.* Waghai, Dane. Pwed widely. May.
B. Heyneana, *Wall.*, F.B.I.—11-500. ^ ° ^ ui u M»v

E. MO« y*. r ^n.0, N- K— ^Q a r j j s ^ :
E.un.flor*,£i»»,if.B.i.-II.505. (American.) Garden* Aug.-Sept.

9. B«rn»5rfoa*B.

B.aoutangula,Ga^»,*.B.i.-II.5O8. *Never.* Shrivardhan. Oct.

10. *Careya.*

C.«borea,2J<,*5.,P.B.i.-7U-5^1. *Kumbha.* W. Ghats, widely. Apl.

LX.—MELASTOMICE-E.

1. *OsbecJcia.*

0. truncata, *Don.*, F.B.I.—11-514. — Londa, Collem. Oct.

3. *Melastoma.*

M. malabathricum, *Linn.*, F.B.I.—11-523. *Palore.* — Kumta, Siddapnr. Oct.-Mar.

10. *Sonerila.*

S. scapigera, *Dalz.*, P.B.I.—IT-598. — Khandalla. July-Aug.
S. Wallichii, *Benn.*, F.B.I.—11-538. — Karwar. Aug.

21. *Memecylon.*

M. Wightii, *Thwaites*, P.B.I,—11-554. — Karwar.
M. terminate, *Dalz.*, F.B.I.—11-558. — W. Ghâts southward.
M. edule, *Boxb.*, F.B.I.—11-563. *Anjan.* — Lanauli, W. Ghâts, widely. Jan.-Mar.

LXI.—LTTHBAEICJE .

1. *Ammannia.*

A. peploides, *Spreng.*, F.B.I.—11-566. — Rice fields, Mai wan. Nov.
A. Ritchiei, *C.B. Clarice.*, F.B.I.—11-566. — Belgaum. *Ritchie.*
A. rotundif olia, *Ham.*, F.B.I.—II- 566. — S avantvadi, M alwan. Nov.
A tennis, *C.B. Clarke*, F.B.I.—11-567. — K onkan. Oct.
A. floribunda, *C.B. Clarke*$_9$ F.B.I.—11-567. — Mahableshwar. Deo.-Jaxu
A. Rotala, *F. Muell.*, F.B.I.—11-567. — *Hullihul.* Talbot. Dec.
A. pentandra, *Boxb.*, F.B.I.—11-568. — Kudra, Londa, Malwan. Aug.
A. baocifera, *Linn.*, F.B.I.—11-569. *Bhar-jambul.* — Mulier, Sind, Guzerat. Nov.
A. salicifolia, *Monti.*, F.B.I.—II-569. — Hnllihul, N. Kanara, Kelgaon, Poona. Nov.
A. xnultiflora, *Boxb.*, F.B.I.—11-570. — Kelgaon, near Poona. Nov.

3. *Woodfordia.*

W. floribunda, *Salisb.*, F.B.I.—11-572. *Dhayti.* — Poona, Deccan Hills, widely. Jan.-May.

5. *Lawsonia.*

^ alba, *Lamb.*, F.B.I.—11-573. *Mendi.* — Henna; planted Gnzerat and Deocan. Sandy, salt land near Bombay seedlings abundant, Apl.-July.

7. *Lagerstrmmia.*

I*, indioa, *Linn.*, F.B.I.—11-575. — Cult, in gardens. May-Aug.
I*, parviflora, *Boxb.*, F.B.I.—11-575. — Hills near Poona. June.
Ii. laneeolata, *Wall.*, ^p.i.—11-576. — Kumta-Sirsi Road. Apl.-May.
L. flos-reginse, *Betz.*, F.B.I.—11-577. *Taman, Mothabondara.* — S. Konkan, Goa. May-July.

9. *Sonneratia.*

S. apetala, *Ham.*, F.B.I.—11-579. — Dharamter, Mumbra, Thana. Feb.
S. acida, *Linn.*, F.B.I.—11-579. — Hareshwar, Konkan. Feb«

10. *Punica.*

P. Granatum, *Linn.*, F.B.I.—11-581. *Dalimb.* — The Pomegranate. Cult, widely.

LXIL—ONAQBACM.

2. *Jnssiaa.*

J.repena, *Linn.*, F.B.I.—11-587. — Guzerat. Nov.
J. sufEruticoBa, *Linn.*, F.B.I.—11-587. *Panlavang.* — Tnlsi Tank, near Poona. Aug.-Oct.

3. *Ludwigia.*

t Parviflora, *Boxb.*$_9$ F.B.I__11-588. — Narel. May-Nov.

(Enotkera {American).

^ roBea, *Ait., DC*, Prod. 111-51. — Escaped from gardens, Poona, Mahableshwar. Nov.-Jan.

5. *Trapa.*

T. bwpinose, *Roxb.*, F.B.I.—11-590. *Shingari Shingada.* — The Water ChesUut. Cult, in tanks widely

LXIIL— SAMYDACEJE,

1. *Case aria.*

C. graveolens, *Date*$_n$ F.B.I.—11-592. *Bokahda.* Hatland, Peint. Aulus, Mawal. Waghai. Dang. Jan.-May.
C. eeoulenta, *Roxb.*, F.B.I.—11-592. *Mori.* Karwar, Yellapur. May.
C. rubescens, *Date.*, F.B.I.—11-593. W. Ghâts, Konkan-
C. tomentosa, *Roxb.*, F.B.I.—11-593. *Chillara.* "vy. Ghâts, Poona. Mar*

3. *Homalium.*

H. zeylonicum, *Benth.*, F.B.I.-11-596. Diggi, N. Kanara. Talbot. May-

TuENEEiCEiE *(Trop. America and Africa).*

Tumera.

T. ulmifolia, *Don* DC*% Prod.—III-346. *Pewli Ghanari.* In gardens. Oct.-Feb.

LXIV.-I'ASSIFLOEJE.

I- *Pas si flora.*

P. fcetida, *Cav., DC,* Prod.—III-331. *Veli Ghani.* As a garden escape frequent.

3. *Modecca.*

M. palmata, *Lam.*, F.B.I.-11-603. *Tyerballi.* Divimana, Sumpkund, N. Kanara. May.

Carica.

C. Papaya, *Linn., DC,* Prod.—XV-II-414. *Papaya.* The Papay. Cult, widely.

LXV.—CUCUEBITACE.E.

2. *Trichosanthes.*

T. palmata, *Roxb.*, F.B.I.—11-606. *Koundal.* Lanauli, Mahableshwar. May-July.
T. cucumerina, *Linn.*, F.B.I.—11-609. *Kadwpadval.* Poona, Karwar. July-Aug.
T. anguina, *Linn.*, F.B.I.—11-610. *Padwal.* The Snake Gourd. Cult.

3. *Trichosanthes.*

T. palmata, *Roxb.*, F.B.I.—11-606. *Koundal.* W. Ghâts, widely. May-July.
T. cucumerina, *Linn.*, F.B.I.—11-609. *Jungli Padole.* Karwar, N. Kanara, Poona. July-Aug.
T. anguina, *Linn.*, F.B.I.—11-610. *Padol, Chiconda, Chachinda.* CuW.

6. *Logenaria.*

L. vulgaris, *Seringe,* F.B.I.—11-613. *Dudhya.* Cult.

7. *Luff a.*

L. fflgptiaca, *Mill,* F.B.I.—11-614. *Ghosili, Ghiya Turoi.* Cult-
L. acutangula, *Roxb.*, F.B.I.—11-615. *Shirola Dodka Turoi.* Cult.
L. amara, *Roxb.*, F.B.I.—11-615. *Kadu-shirola, Kadudodka Ran Turoi.* W. Ghats. Sept-
L. echinata, *Roxb.*, F.B.I.—11-615. *Kukarvel Deoddngri.* Godra, Bombay. Sept.

*&.*Benincasa.*

B. oerifexa, fitoi., V.B.X. -11-616. *Kohala.* Cult

9. *Momordica.*

M. Charantia, Zittw., F.B.I.—11-616. *Karli.* Cult, widely. May-Aug.
M. balsamina, *Linn.*, F.B.I.—11-617. *Kurelo-jangro.* g_{ind}, Patia^pxn. Nov.
M. dioica, *Roxb.*, F.B.I.—11-617. *Kartoli.* Decora. Cult, widely. June-Aug.
M. cochinchinensis, *Spr.*, F.B.I.—11-618. N. Kanara. June-July.
M. cymbalaria, *Fenzl* F.B.I.-11-618. *Kadwanchi,* Penicopa, Dharwar. Nov.

10. *Cucumis.*

C. tiigonus, *Roxb.*, F.B.I.—II-619. *Karit.* Poona. June.
C. prophetarum, *Linn.*$_f$ F.B.L—II-619. Mnlier, Sind.
C. Melo, iih».,F.B.I.—H-620. *Kharbuza.* Cult.
C. Melo, var. utilitissimus. *Tur Kakri.* Cult.
C. Melo, .-ar. momordica. « W A Cult· and ^y on hillg near Poona·
C. satiTus, Xt»».,y.B.i.-JL̈l-6aO. J o i n. Calt< Qot.-Deo.

11. *Citrullus.*

C. colooynthis, *Sch.*, P.B.I.—11-620- *Kadu vriadavan.* Deccan, Guzerat. Nov.-Jan.
C. vulgaris, *Schrad.*, F.B.I.—11-621. *TarbuJ, Kalingad.* Cult.
C. vulgaris, var. fistulosus. Cult.

12. *Cephalandra.*

C. indioa, *Naud.*, F.B.J.—II-621. *Tondli.* Sind, Rajkot, Deccan. Aug.-Sept.

13. *Cucurbita.*

C. moschata, *Duchesne* (Duthie's " Field and Garden Crops)." *Bhopla.* Cult.
C. Pepo, *DC,* P.B.I.—11-622. *Vegetable marrow.* Cult

14. *Bryonia.*

B. laoiniosa, Z™w., F.B.I.—11-622. P;«<fcw7 or *Pindwail, Shivlingi.* Poona. Aug.-Sept.

15. *Mukia.*

M. scabrella, .4m., F.B.I.—11-623. *Hanali, Chirati.* Hills near Poona, Dakor, Guzerat. July.

16. *Zehneria.*

Z. Baueriana, *Erdl.*, F.B.I.—11-624. Mahableshwar, Ambe Ghât. Aug.-Oot.
Z. umbellata, !%«>., F.B.I.—H-625. *Gomethi, Gogari.* W. Ghâts. Sept.-Oct.

18. *Bhynchocarpa.*

R. foetida, *Schrad.*, F.B.I.—11-627. *Nurakwel.* Castle Rock, Miradongar, Penn. Oct.-Nov.

19. *Corallocarpus.*

C epigae$_{a\#}$ JT. /!, F.B.I.—11-627. *Karwina.* Poona. Badami. June-Aug.
C. oonocarpa, *H.f.*, F.B.I.—11-628. *Nurki.* Malpor, Gander Guzerat. *Dalz.*
0. velutina, J5T./., F.B.I.—11-628. Siud. *Dalzell.*

21. *Ctenolepis.*

C Garcini, *Afaud.*, F.B.I.—11-629. Surat. Oct.
C cerasiformis, *Naud.*, F.B.I.—11-630. Verawal.

22. *Diccelospermwn.*

I>- Ritchiei, C.jff. *Clarke,* F.B.I.—11-630. *Gogara.* W. Ghâts, near Matheran. Julj-Oct.

28. *Zanonia.*

Z. indioa, *Linn.,* F.B.I.—11-633. *ChirpotL* Vingorla. *Dalzell.* Fruit ripe. May.

LXVI.—BEGONIACEiE.

1. *Begonia.*

B- integrifolia, 2)a^., F.B.I.—11-648. W. Ghats. *Dalzell.*
B. orenata, *Dryand,* F.B.I.—11-651. Mahableshwar, Deccan Hills, Sept.
B. concanensis, *A.D.C.*, F.B.I.—11-663. Lanauli. Aug.
B. trichocarpa, *Dalz.*, F.B.I.—11-653. W_ Ghats_ *Dalzell.*

LXVII.—DATISCACE^:.

2. *Tetrarneles.*

T. nudiflora, R. Br., F.B.I.—11-657. *Ugadlo.* W_ Gh&ts* N* Kanara_ Feb.-Mar.

LXVIII.—CACTACEiE.

Cereus.

C- multiaDgulariB, Saw., D C , Prod.—III-463. *Bhowdari Nigadung.* Gardens, Poona.
C- peruvianus, raierw, X).C, Prod.-TlII-464. *Sadari Nigadung.* Planted as a fence. Kumta. June-July.
C. quadrangularis, *Haw., DC.* Prod!—III-468. *Choudari Nigadung,* Planted. Poona. June-July.
C triangularis, *Haw,, DC,* Prod.—III-468. *Tindari Nigadung.* Planted, Poona. Jaly.

* *Opuntia.*

O- DiUenii, .ffaw., D C , Prod.-III-472. P*7a *Nigadung.* Poona» rare- Jnne-July.
O. nigiicans, *Haw., DC,* Prod.—III-473. *Nigadung.* Deccan, very abundant.
O. cochinillifera, *Haw.% D.C,* Prod.—III-473. *Binkanta Nigadung.* > Planted, Bombay.
O. Ficus-indica, *Haw., DC,* Prod.—III-473. ilfo^a *Binkanta Nigadung,* Poona. Feb.-Mar.

P. aculeata, *Mill., DC,* Prod.—111-474.
P. grandiflora, *Raw., DC,* Prod.—III-475. *Pereskia,* Gardens Planted, Poona. Jnly

P. Hookeri, Nicholson's " Diet. Gard." *Phyllocatfis.* Gardens. June.

LXIX.—FlCOIDBJ!.

A. canariensis, *Linn.,* F.B.I,—IIL659. 1. *Aizoon.* Hub river, near Karachi. Dec-

1. S. portulacastrum, *Linn.,* F.B.I.—11-659. *2. Sesuvium** Revadanda. Dec.

3. *Trianthema.*

T. monogyna, *Linn.,* F.B.I.—11-660. *Visha Karpa.* Karachi, Poona. June-Feb,
T. crystallina, *Vahl.,* F.B.I.—11-660. *Bhis Karpra.* Bijapur, Badami. Oct.
T. pentandra, *Linn.,* F.B.I.—11-660. *Bhis Kapra.* Poona, Badami, Karachi. Oct.-Nov.
T. decandra, *Linn.,* F.B.I.—11-661. *Bhis Kappa.* Adur, 10 miles W. of Haven*, Dharwar Coll. Dec.
T. hydaspicat *Edgw.*9 F.B.I.—11-661. Karachi. Dec,

4.. *Orygia.*

O. decumbens, *Forsh.,* F.B.I.—11-661. Karachi. Jan.

5. *Mollugo.*

M. hirta, *Thunb.,* F.B.I.—11-662. *D user a Sag, Kottruch.* Khandalla. Feb.-Apl.
M. spergula, *Linn.,* F.B.I.—11-662. *Jarshi.* Badami, Belgaum. Oct.
M. stricta, *Linn.,* F.B.I,—11-663. *Jharshi.* Poona, Panchgani, Belgaum. Sept.-Nov.
M. ceryiana, *Seringe,* var. rupestris, F.B.I.—11-663. *Pada.* Guzerat, Badami. Oct.-Nov.

6. *Gisekia.*

G. pharnaceoides, *Linn.,* F.B.I.—11-664. *Waluche Baji.* Badami. Aug.-Sept,

7. *Limeum.*

L. indicnm, *Stocks,* S.B.I.—11-664. Sind.

LXX.—UMBELLIFEB.E.

1. *Sydrocofyle.*

H. javanica, *Thumb,* F.B.I.—11-607. Hoolicul, Kanara. Feb.
H. burmanica, Kurz, F.B.I.—11-668. Bombay. Oct»
M. asiatica, *Linn.,* F.B.I.—11-669. *Brahmi.* Deccan, S. M. Country, W. Ghats. June-Dec.
H. nitidula, *Rich,* JDC, Prod.—IV-66. Gardens widely. Sept.-Mar.

7. *Bupleurum.*

B. mucronatum, *W.SfA.,* F.B.I.—II-676. Santaveri. Dec-

11. *Carum**

C. stictocarpum, *C. B. Clarice,* F.B.I.—11-680. *Ban Owa.* Deccan Hills, widely cnlt. Sept.
C. Eoxburghiaaum, *Benth.,* F.B.I.-II-682. Deccan Hills, widely. Nov.-Dec.
C. copticum,£en^,F.B.i.-II-682, *Ow*.* Cult Salt Swamp, Bombay. ApU

13. *Pimpinella.*

P. Heyneana, *Wall.,* F.B.I.-II.684. Wadi, near MahableBhwar. Dharwar. Oct.
P. CandoUeaoa, *W. $ A.,* F.B.I.-II-687. Panohgani. Oct.
P. monoica, *Dalz* F.B.I_IW87. Mahableshwar. Nov :
P. tomentosa, *Dalz.,* F.B.I.-H-689. Sinhagad. Nov.
P. adscendens, *Dalz.,* F.B.I.-II-689. Poona, Sinhagad.
P. .]*»**». *DaU,* F.B.I.-H-689. Deccan ravines. D

20 *Faniculum.*

F. vulgare, *Oaertn.,* F.B.I.—11-695. *Bari Shopha.* Cult. Bombay. Dec.

32. *Peucedanum.*

V' graveolens, *Benfh.,* F.BJ^-II-709. *Bdlant Shop.* The Dill Seed-
Shepu. tjjjg young herd. Cult.

P. Dhana, *Ham.*, P.B.I.—11-709. *Koldan.* Pen, Konkan. Aug.
P. grande, *C. B. Clarke*, P.B.I.—11-710. *Bdfali.* Mawal Taluka. July.

33. *Keracleum.*

H. aquilegifolium, *C. B. Clarke*, P.B.I.—11-715. Konkan. *Stocks.*
H. Sprengelianum, *W. & A.*, P.B.I.-II-716. Khandalla, W. Ghats. Aug.
H. concanense, *Dalz.*, F.B.I.-H-716. Panchgani, Khandala. Aug.
H. Pinda, *Dalz. $ Gibs*, P.B.I.—11-717. *Pinda.* Hurry Chander. Aug.

34*. *Cortandrum.*

C. aativum, *Linn.*, P.B.I.^H-717. *Bhana.* (grain) Coriander, *Kotimher* (herb). Cult.

34**. *Cuminum.*

C. oyminum, *Idnn.*9 P.B.I.—11-718. *Jira.* Cult.

35. *Daucus.*

D. carota, *Linn.*, P.B.I.—II.718. *Gajir.* The Carrot. Cult.

LXXL—ABALIACEJE.

3f. *Panax.*

P. fraitcosum, *Linn., DC*, Prod.—IV-254. Gardens.
P. cochleatum, *DC*, Prod.—IV-253. Gardens.
P. nitidum, *Sort.* Gardens.
P. Victoria, *G. C. n.s.*—XIX-405. Gardens.

Fatsia.

F» papyrifera. •« D. et PL Rev. Hort., 1854 "—105. The Rice Paper Plant;. (Syn. *'Aralla papyrifera Bot. Mag. t.* 4897.) Gardens. Dec.

7. *Heptapleurum.*

H. venulosnm, *Seem.*, P.B.I.—11-729. Gardens, Bombay, Poona.

8. *Trevesia.*

T. palmata, *Vis.*, P.B.I.—11-732. Gardens, Poona. Apr.

15. *JBLedera.*

H- Helix, *Linn.*> P.B.I.—11-739. *Ivy.* Gardens, Poona.

LXXIL—COBNACE-E.

1. *Alangium.*

A. Lamarckii, *Thw.*, F.B.I.-11-741. *Ankol.* Bodeli, Guzerat Gadhul, N. Kanara. Jan.

4. *Mastixia.*

M. pentandra, *BL*, P.B.I.—11-745. Dharwar, Kanara, Konkan. *Stocks.*

LXXIV.—CAPBIFOLIACBJ:.

6. *Lonicera.*

I*. Leschenaultii, *Wall.*, p^j.—111-10. *Honeysuckle.* Planted.

LXXV.—RUBIACB^. .

2. *Anthocephalus**

A. Cadamba,M^.,P.B.i.-III-23. *Mew,Niv.* Dasgaon, Ratnagiri Dist. Oct.

4. *Adina.*

A-cordifolia, Bb^./.,p.B.i.-III-24. *3M+ Zed.* Naeik, Wassind. Ang.-Feb.

6. *Stepliegyne.*

s- Parvifolia, *KortK* P.B.I.-III-25. *Kadamb, Kalamb.* DftbhoL No7_

6. *Nauclea.*

N. purpnrea, *Boxb.*, F.B.I.—111-26. *Devphanas.* — S. Kanara. Feb.
N. elliptica, *Dalz.*, F.B.I.—111-27. *Phuga.* — Tiniagbat. Feb.
N. missionis, TPaW., F.B.I.—111-27. *Phuga.* — Karwar, Sirsi. Apl*

10. *Symenodiction.*

H. excelsnm, TFa#., F.B.I.- 111-35. *Kalâhadu.* — Katriz Gbât. Aug.
H. obovatum, TFaW., P.B.I.—111-36. *Kadwah Sirid.* — Matheran.

12. *Wendlandia.*

W. exserta, D C, F.B.I.—111-37. — Decid. forest, N. Deccan. *Talbot.*
W. Notoniana, *Wall.*, F.B.I.—111-40. — Castle Eock, Thalgbât. Feb.

14. *Dentella.*

D. repene, *Forst.*, F.B.I.—111*42. — Badami, Poona, Dharampter. Apl.-Nov.

20. *Hedyotis,*

H. vestita, *Br.*, F!B.I.—111-58. — SavanWadi, Kumta. Oct.-Nov.
H. nitida, *W. $* ^.-111-61. — Londa. Nov.

21. *Oldenlandia.*

O. corymbosa, Zirtw., F.B.I. —111-64. *Khet papada, Pit Papada.* — Poona, Godra. Kalyan. Sept.-Nov.
O. diffusa, *Boxb.*, F.B.I.—111-65. — Sirsi. *Talbot.* April-
O. Heynii, *Br.*, F.B.I.—111-65. *Paripath.* — Malwan, Belgaum. Nor.
O. umbellata, *Linn.*, F.B.I.—111-66. *Ckirval.* — Wadi, near Eaiobor. Sept.-Jan.
0. dicbotoma, *Boen.*, F.B.I.—III-66. *Kqjhuri.* — Poona District.
O. aspera, *DC*, F.B.I.—111-68. — Poona, Badami. Feb.-Aug.
O. senegalensis, *Kier.*, F.B.I.—111-68. — Kirkee. Sept,
O. xetrorsa, *Boiss.*, F.B.I.—111-68. — Banks of Mulier, Karaobi. Nov.

22. *Anotis.*

A. lancifolia, *Dalz.*, F.B.I.—111-73. — Mabablesbwar, Purandhar. Sept.
A. Rheedii, *W. Sf A.*, F.B.I.—111-73. — Near Matberan, Goa Gbats. Aag.-Oot.
A. Montboloni, *Hook, /.*, F.B.I.—111-73. *Full.* — Poona. Aug.
A. foetida, *Dalz.*, F.B.I.—111-74. — Kanara, Kbandalla, Londa. Aug«

25. *Ophiorhiza,*

O. Harrisiana, *Heye*, F.B.I.—III-78. — Ambe Gbât, Divimana. Aug.

29. *Mussænda.*

M. frondosa, *Linn.*, F.B.I.—111-89, *Shivardoli.* — Koina Valley, N. Kanara, widely, July-Nov.

Hamelia {American).

H. patens, *Jacq. D.C.*, Prod.—IV-441. — Planted*

42. *Webera.*

W. corymbosa, *Willd.*, F.B.I.—III-102. — W. India. *E. de Crespigny.*

46. *Bandia.*

R. nligioosa, *D.C.*, F.B.I.—111-110. *Pendar.* — *Pandri.* Near Pen. Porebunder. June.
R. dumetomm, *Lamh.*, F.B.I.—111-110. *Qela.* — Matheran, Mabablesbwai. Snmpkund. Mar.-July-
B. rugulosa, *Thw.*> F.B.I.—III-113. — Divimana, N. Kanara. Matberan. Feb.-Mar.

47. *Gardenia.*

G. lucida, *Boxb.*, F.B.I.—III-115. *Dilcémali.* — N. Kanara. June.
G. gummifera, *Linn.9 f.*, F.B.I.—III-116. *Dihimali.* — N. Kanara. Feb.-June.
G. tnrgida, *Boxb.*, var. montana, F.B.I.—II1-118. — Poona District. June.
G. florida, i. *Boxb.*% Fl. lad.—1-703. — Cult. Gardens.

61. *Knoxia.*

K. corymbosa, *Willd.*, F.B.I.—111-128. — Londa. Gamji, 8. M. Railway.

63. *Canthium.*

C. umbeftlatum, *Wight*, F.B.I.—IJI-132. — Kbandalla, Mabableswar. Nov,
C. Rbeedii, *DC.*, F.B.I.—111-134. — yacombi, N. Kanara, Feb.-May.

C. angustifolium, *Roxb.*, F.B.I.—III-135. *Chapyel.* Castle Rook, Kadgal. N. Kanara. Nov.
C. parviflorum, *Roxb.*, F.B.I.— III-135. *Kirni.* Poona, Mungode, N. Kanara. Apl.-May.

64. *Vangueria.*

V. spinosa, *Roxb,*, r.B.i.—III-136. *Alu.* Lanauli, Peint Talaka.

66. Ixora.

I. lanceolaria, *Colebr.*, F.B.I.—111-138. Godhnli, Karwar. July.
I. Notoniana, *Wall.*, F.B.I.—111-138. Santaveri. Deo.
I. polyanfcha, *Wight.*, F.B.I.—III-140. Nilknnd, N. Kanara. Mar.
I. elongata, *Heyne*, F.B.I.—III-141. Paiwar Ghat, Bheemashank ar. Feb.
I. parvifloia, *Vahl.*, F.B.T.—111-142. *Raikuda, Lokhandi.* Pal jungles. Matheran. Feb.
I. ooccinea, *Linn.*, F.B.I.—III-145. *Ok-bok.* Thana, Sion, Ratnagiri. Dec.
I. nigricans, *Br~*, F.B.I.—III-148. *Ambavne.* Kumta, Mahableshwar. May-Nov.

67. *Pavetta.*

P. indien, *Linn.*, F.B.I.—III-15O. Matheran. Mar.-Api.
P. hispidnla, *W. # A..*, var. sbiphonantha, F.B.I.—III-151. Matheran, Bheemashankar. May-June.
P. Brunonis, *Wall.*, F.B.I.—III-152. Yacombi, N. Kanara. May.

68. *Coffea.*

C. arabica, *Linn.*, CD., Prod.—IV-499. *Boond.* Coffee. Planted, Jan.-Apl.

69. *Morinda.*

M. citrifolia, *Linn.*, F.B.I.—III-155. *A'l, Bartondi.* Poona. May.
M. citrifolia, *Linn.*, var. bracteata. Mormagoa, near Sea. Nov.
M. tinctoria, *Roxb.*, F.B.I.—III-156.

75. *Psyckotria.*

P. Thwaitesii, *SooK f.*, F.B.I.—TII-162. Nilknnd Ghåt, N. Kanara. Mar.
P. trnnoata, *Wall.*, F.B.I.—III-163. Mahabl. Diggi, N. Kanara. May.
P. Dalzellii, *Hook. /.*, F.B.I.—III-163. Banda, Yellapur, N. Kanara.
P- sarmentosa, *BL*, F.B.I.—III-165. Yacombi, N. Kanara. Jan.- Feb.

76. *Ch as alia.*

C. corviflora, *Thw.*, F.B.I.—II1-176. Karwar, Siddapur, Divimana, N. Kanara. Apl.-May.

79. *Lasianthus.*

L. vennlosus, *Wight*, F.B.I.-111-190. W. Ghåts, *JE.de Crespigny.*

80. *Saprosma.*

S. indicum, *Dalz.*, F.B.I.-III-192. Ghåts, Western Peninsnla.

84. *Hamiltonia.*

H. sauveolena, *Roxb.*, F.B.I.—III-197. *Gidas, Gidasazoa, Gkanera.* Sinhagad, Mahableshwar, Katriz-Feb.

Serissa (Eastern Asia).

S. fetida, *Cornm.*, JD.C, Prod.—IV-675. Gardens. May.

86. *Hydrophylai.*

H. maritima, *Linn.*, F.B.I.—III-199. Porebunder, Katiawad Coast. Dec.

87. *Spermacoce.*

S. stricta, *Linn.,f.*, F.B.I.—III-200. Poona, Badarai. Oct.-Nov.
S. hispida, *Linn.*, F.B.I.—II1-200. *Madanghanti.* Nadiad, Poona. Sept-Oct.

88. *G-aillonia.*

9- hymnoetephana, ^«««5 * *Spach*, F.B.I.—II1-202. Bullo Khan, Sind. Ang.

89. *Jtubia.*

R. cordifolia, *Linn.*, F.B.I.—III-202. *Manjishtha, Viiali.* Mahableshwar. Sept.-Jan.

LXXVIII.—Compositæ.

2. *Centratherum.*

C. Oiolle, *Benth.*, F.B.I.—111-227. Tuggiepet, N. Kenan:. Nor.
C. Bitiiei, *Hook.f.*, F.B.I.—III-228. Goa. Nov.

C. phyllolamnm, *Benth,* P.B.I.-III-228. Marma-oa' Oct.
C. tenue, *Clarke,* F.B.T.—III-228. Mahableshwar. Oct.
C. Hookeri, *Clarke,* F.B.I.—III-228. Khandalla. Wov-

3. *Lamprachanwn.*

L. miorocepbalum, *BentK,* F.BJ.—III-229. *Ajadandi, Brahmadandi.* Mahableshwar. Oct.

4. *Aden%on.*

A. indicum, *Dalz.,* F.B.I.—III-229. *Koosumb, Mota Sonhi.* Mahableshwar, Tinai, N. Kanara. Sept.

6. *Vernonia.*

V. cinerea, *Less,* I.B.I.—III-233. *Sahadevi.* Matheran, Tata, Sind. Feb.
V. divergens, *Bent/i*$_t$ F.B.I.—III-234. *Kandesur.* Sirsi, N. Kanara, Khandalla. Dec.
V. anthelmintica, *Willd.,* F.B.I.—III-236. *Kadukarala.* Poona.
V. cinerascens, *Schultz Bip.,* F.B.I.—11-237. Ruk, Karachi, Sind. Oct.-Dec.
V. indica, *Clarke,* F.B.I.—III-238. Panchgani, Mawar. Oct.

6. *JElephantopus.*

E. scaber, *Linn.,* F.B.I.—III-242. *Baltan, Hastipata.* Bulsad, Gozerat, Konkan, widely. Sept.-Nov-

7. *Adenostemma.* *

A. *visGosum, Forst.,* F.B.I.— III-242. Mahableshwar. Sept.-Feb.

8. *Ageratum**

A. conyzoides, *Linn.,* F.B.I.—III-243. *Oshadi, Sadadevl.* Poona, widely spread. Nov.-Mar.

12. *Dichrocephala.*

D. latifolia, *DC.* F.B.I.—III-246. Mawar, Panchgani. Aug.-Sept.

13. *Cyathocline-*

C. lyrata, *Cass.,* F.B.I.—III-246. *Avkir.* Kirkee, Mawal taluka. Nov.-Feb.
C. lutea, *Law,* F.B.I.—III-246. Karlee, Mawal. Feb.

14» *Grongea.*

G. madraspatana, *Poir^* F.B.I.—III-247. *Mustaru, Bovana.* Dharwar, Panwel, Sukkur, Sind. Dec-May*

20. *Aster.*

A. ameiins, *Linn., DC,* Prod.—V-231. Michelmas Daisy. Cult. Poona.

22. *Erigeron.*

E. asteroides, *"Boxb.,* F.B.I.—III-254. *Sonasali, Maredi.* Ahmednagar, Poona. Oct.-Kov.

Vittadenia (Australasia).

V, aastralis, *A. Bich.,* DC. Prod.—V-260. Australian Daisy. Cult, gardens-

24. *Conyza.*

C. strict*, *Willdn* F.B.I.—III-258. Panchgani, Wad», near Mahableshwar. Oct.

26. *Blumea.*

The species of this genus generally are named *Buramhi* or *Mharbir.*

B. ampleotens, DC, F.B.I.—111-260. Bombay, Vankanea, Kattiawad. *Veer.*
B. Wightiana, *DC,* F.B.I.—ItI-261. Maiheran, Poona. Dec-Jan.
B. glomerata, *DC,* F.B.I.—III-262. Konkan. *DalzelU*
B. lacera, DO., F,B i.—111-263. *Burand** N. Kanara, Dang. Feb.-Apl.
B. virens, DC, F.B.I.—111-264. Konkan.
B. membranacea, F.B.I.-III-265. *Mharbir.* Poona, Alur, Dharwar. May.
B. oxydonta, DC, F.I.B.-III-266. Lananli. Jan.-Mar.
B. eriantha, DC, F.B.i.—III-2fi6. *Nimurdi.* Panwel. Feb.
B. Malcolmii, *Sook.f.,* F3.i.—III-266. Mahableshwar.
B. malabarica,JZbo^/.,F.B.i.-III.267. Sirsi, N. Kanara. Feb.
B. myriocephala, *DC,* F.B.L-III-269. Divimana, N. Kanara. Feb.

28. *Plucheov.*

P. Wallichii, *DC,* F.B.I.-III-272. Waghai, Dangs. Feb.
P. tomentosa, *DC,* F.B.L-111-272.. Bijap^{g}ur> ^^ Feb.
P. arguta, *Bois,* M.i.—111-273. Mulier Di8trict> sind. Jan,

N. sericeus, *TJioms.*, F.B.I.—III-273

29. *Nanothamnus.*

Boshi, Lanauli. Apl.

E. divaricata, *Cass.*, F.B.I.—III-274.

30. *Epaltes.*

Malwan, Sangameswar, Konkan. Nov.-Dec.

31. *Sphaeranthus.*

S. africanns, *Linn.*, F.B.I.—III-275. *Mundi, Gorakhamundi.*

Vingorla. Oct.

33. *Blepharispermum.*

B. subsessile, *DC,* F.B.I,—III-276.

Dharwar, Katriz, near Foona. Sept.

39. *Anaphalis.*

A. cutchica, *Clakre.*, F.B.I.—111-284.

Barda, Kattiawad.

40. *Lasiopogon.*

L. lanatum, *Cass.*, F.B.I.—III-287.

Kirthar Mts., Sind. Mar.

42. Gnaphalium.

G. albolutenm, *Linn.*, F.B.I.—IH-288. Matheran. Dehu, Foona Dist. Mar.
"G. indicum, *Linn.*, F.B.I.—III-289. POD, Konkan. Feb.
G. pulvinatum, *Del.*, F.B.I.—II1-289. Mawai Taluk. Feb.

44. *Caesulia.*

C. axillaris, *Boxb.*, F.B.I.—Ill-291. *Mdkd.*

Deooan, widely. Deo.-Feb.

45. *Inula.*

I. grantioides, *Boiss.*, F.B.I.—III-296.

Hyderabad (Sind). Dec.

46. *Vicoa.*

"V. auricnlata, *Cass.*, F.B.I.—III-297. *Son kadi.* Deccan. Nov.-Feb.
V. cernua, *Dalz.*, F.B.I.—III-297. Mahableshwar. Nov.-Feb.

47. Pulicaria.

P. foliolosa, *DC,* F.B.I.—III-298. Near Poona. Nov.
P. Wightiana, *Clarke,* F.B.I.-III-298. Deccan, widely. Sept.
^ augustifolia, *DC.*, F.B.I.—III-299. Porebandar. Dec.
P- glaucescens, «7iM6. ^ ^acA., F.B.I.—111-300. Sind.
I*. Boissieri, *Hook.f.*, F.B.I.—III-300. Sind.
P. Stocksii, .Hbo*./., F.B.I.-III-300. Laki, Sind. Oct.

48*. *Lagascea.*

L. mollis, *Pers.*, F.B.I.^III-302. *Jharwad.*

Pecoan, nearly all year.

48* • *Melampodium.*

M. divarioatom, *DC,* Prod.—V-520.

Poona, weed in gardens. Sept.

51. *Xanthium.*

X. strumarium, *Linn.*, F.B.I.—III-303. *Sankeswar.*

Poona, Deccan, widely. Jan.-Feb.

Zinnia.

Z. elegans, *Jacq., DC.,* Prod.—V-536. *Jinia.*

Garden escape. Sept.

52. *Siegesbeckia.*

S. orientalis, *Linn.*, F.B.I.—III-304. *Katampam, Katampu.*

Panchgani, Poona. Dec.

64. *Eclipta.*

E. alba, *Hassk.*, T.B.I.—III-304. *Mdka, Bungaroo.*

Karachi (Sind), Poona, Kalyan. Oct.-Dec.

55. *Sclerocarpus.*

S. africanus, *Jacq.*, F.B.I.—III-305.

Nasik, Poona. Aug.

56. Blainvillea.

3. latifolia, *DC,* F.B.I.-III-305.

Poona.

57. *Wedelia.*

W. nrticsefolia, *DC,* F.B.I.—III-306. Poona, K"anara. Aug -
W. biflora, *DC,* F.B.I.—III-306. *Sonhi.* Maimagoa. Bee-

Helianthus.

{North America, Peru, and Chili.)

H. tuberous, *L. DC,* Prod.—V-590. *Artichoke.* Jerusalem Artichoke. Cnlt.
H. animus, *L.DC,* Prod.—V-585. *Suryaful.* Sunflower. Cult.
H. argyrophyllus, *Sort. Kasi Suryaful.* Silvery-leaved Sunflower. Cnlt.
H. rigidus *(Nicolson's Diet. Gard., II.,* 127). Small Sunflower. Cult.

58. *Spilanthes.*

S. Acmella, *Linn.,* F.B.I.—III-307. *AkhalJcara.* *Nov.*

58*. *Guizotia.*

G. abyssinica, *Cass.,* F.B.I.—III-307. *Karala, Kalatil.* Cultivated.

69. *Glossocardia.*

G. linearifolia, *Cass.,* F.B.I.—III-308. *Pitpapda, Phattarsuva. Gooi.* Deccan. Aug.

Cosmos.

C. bipinnatns, *Cav., DC,* Prod.—V-606. Gardens.

60. *Bidens.*

B. pilosa, *Linn.,* F.B.I.—III-309. Aug.

61. *Glossogyne.*

G. pinnatifida, *DC,* F.B.I.—III-310. Sonoree Ghât, Poona. Oct.

62**. *Tridax.*

T. proenmbens, *Linn.,* F.B.I.—Ill 311. Deccan, widely. Common weed.

63. *Achillea.*

A. tnillefolium, *Linn.,* F.B.I.—Ill 312. Milfoil. Gardens.

Flaveria {Tropical America).

F. contrayerba, *Pers., DC*—V-635. Poona, Bijapur, superabundant all the year.

71. *Tanacetum.*

T. vulgare, *L. DC,* Prod.—VM28. *Tansy.* Gardens, Poona.

72. *Artemisia.*

A. parviflora, *Roxb.,* F.B.I.—tII-322. *Tail Downa.* Mahableshwar. Oct.
A. scoparia, *Waldst. Sf Kit.,* F.B.I.—Ill-323. *Gajara.* Mulier, Sind. Mar.
A. vulgaris, *Linn.,* F.B.I.—II1.325. *Surband, Dhor Downa.* Panohgani. Oct.
A. pallens, *Wall.,* F.B.I.—III-329. *Davna.* Cult, at Alandi, Jejuri for nse in the *Ram nawami* festival. Apl.

76. *Gynura.*

G. nitida, *DC,* F.B.I.—III-333. Lananli, Pnrandhur, Singhur. Sept.

77. *Emilia.*

E. sonchifolia, *DC,* F.B.I.—Ill-336 *Sadamandi.* Foona. Sept.

78, *Notonia.*

N. gTandiflora, D C , F.B.I.—111-337. *Vandar-roti.* Mulhargad, Poona. Sept.
N. balsamica, *Dalz. $ Gibs.,* F.B.I.—111-337. Hills, near Satara. Sept.

79. *Senecio.*

{The name Sonki ie loosely applied in this genus)

S. tenuifolius, *Burm.,* F.B I.—111-345. Badami. Oct«
S. Hewrensis, *Hook.f.,* F.B.I.—111-346. Jooneer. Sept.
S. Edgcworthii, *Hooh.f..* F.B.I.-1II-346. Katraz> Mahableshwar. Dongargan. Aug.-Nov.
S. Dalzelliaj *Clarice,* F.B.I.—III-346. Pand. Matheran. Dec.
S Grahamii, *£[ook.f.,* F.B.I;—III-346. *Sonki,* Khandalla. Sept.

S. Gibsoni, *Hoofcf.*, F.B.I.—III-347. Konlcan and Kanara. *Zaw, Dalzell.*
3. belgaumensis, *Clarke,* F.B.I.—III-348. Ainsbi, N. Kanara, Mahablesh^er. Oet.-Jan.

80. *Othonnopsis.*

O. intermedia, *Boiss.*, F.B.I.—Ill-356. Top of Eojak Pass. H. £J. M. James. Spriog.

82. *Calendula,*

C. officina:is, *Linn,*, F.B.I.—III-357. Marjgold. Cult, widely.

83. *Echinops.*

E. echinatus, *DC,* F.B.I.—III-358. *Utkatar.* Poona. Nor.

90. *Goniocaulon.*

G. glabrnm, *Cass.*, F.B.I.—III-377. *Kadkuivmba.* Uruli, Poona. Ja::.

93. *Trichulepis.*

T. radicans, *DC.,* F.B.T.—III-381. *Dahan.* Poona. Sept
T. amplexicaulis, *Clarke,* F.B.I.—111-381. *Dahan.* Khandnlla. Deo'
T. glaberrima, *DC.,* F.B.I.—I 11-381. *Dahan.* Pancbgani. Dec.

94. *Tolutarella.*

V. divaricata, *Benth.*, F.B.I.—Ill 383. *Lih Katmandu.* Broach, Mulir, Sind. Nov.

96. *Carthamus.*

C tioctorins, *Zinn.*, F.B.I.—III-386. *Kusumba. Kardi.* Cult. Jan.-Feb.

98. *Dicoma.*

D. tomentosa, Caw., F.B.I.—III-387. *Navanangi.* Tata, Sind. Jear. Jan.

98.* *Hochstetteria.*

H. Scbimperi, *DC,* F.B.I.-III-388. Sind. Jan.

114. *Lactuca.*

k Hejneana, *DC,* F.B.I.—III-403. Deocan, widely. Dec
- remotiflora, *DC,* F.B.I.—III-403. Poona, Badami. Sept.
Scariola. *Linn.*, var. satlva. *Salad.* Tbe Lettuce. Cult, widely.

116. *JPicridium.*

P. tingitanum, Z>e^., F.B.I.—III-413. Sind.

117. *Sonchus.*

S- asper, *Vill.,* F.B.I.—414. *Mhatara.* Poona. Jan.- Mar _
o- oleraceus, *Linn,*, F.B I.—III-414. *Mhatara.* Deccan, widely. Sept.-Mar#
S. ai-vensis, Xiwn., F.B.I—III-414. *Mhatara.* Eijapur. *Dec.*

118. *Launea.*

pinaatifida, Cass., F.B.I.—III-416. *Palhari.* Rewadanda, Verawal. Dec.
sp. inc. Kirthar Mts.. Sind. Mar.

0.1. 0. P. O.-No. *lit* R. & A.-13.3-98.-350.-E. E,

REPORT '0? THE DIRECTOR OF THE BOTANICAL SURVEY OF INDIA FOR THE YEAR 1898-99.

Turing the year 1898-99 every advantage was taken of the funds placed at the disposal of the Botanical Survey for exploration in Burma, Assam, and Bengal. In Burma, attention continued to he given to the Kachin region, where a native collector was at work under the supervision of Lieutenant Cruddas, S.C., whose assistance to the survey was acknowledged in last annual report, and afterwards under the supervision of Lieutenant Lee, S.C., who has most kindly continued the work initiated by his predecessor. In June 1898, however, Lieutenant Lee had to suggest the necessity for recalling the collector Mokeem, whose health had broken down. From the Chin region, Mr. Prazer, formerly a collector of the Survey, sent some plants, while Mr. Peche of Moulmein again assisted the Survey by making collections on its behalf in Tenasserim. In Assam, attention has been particularly given to two areas, the Jaintea Hills and the Eastern Naga Hills. In the Jaintea Hills, some trained Lepcha Collectors selected by Mr. E. Pantling of the Cinchona Department have worked during the past cold season under the supervision of Mr. S. E. Rita, Assistant Commissioner at Jowai; the results of their work are most satisfactory. ._In the Eastern (Jaboka) Naga Hills, an area never before botanically explored, a native collector, Abdul Huq, was at work from September 1898 Wl the <slose of the official year. The results of his work have also been good; tMs is altogether due to the kind assistance given to Abdul Huq by Mr. T. P. Severin of Tingali Bam, whose influence with the Nagas has enabled the collector t;° visit the area in safety. The Director of the Survey visited the Andamans In January 1899, taking with him the collector Mokeem whose health had Meanwhile improved. Advantage was taken of this visit to investigate points °f interest in connection with the Andaman vegetation, and the native collector ^as left behind under the protection of Mr. E. H. Man, C.I.E., to assist the Permanent collector whose work Mr. Man kindly superintends. This permanent collecLor, Behari, has been at work throughout the year collecting in various parts of South Andaman and in the Nicobars. Shortly before the °lose of the official year, an opportunity was afforded of visiting North Andaman, the botany of which is not well known, owing to H. M. I. **• €C Investigator "proceeding there on survey work.^Captain Anderson, J-M.S., naturalist attached to the Marine Survey, very kindly took Mokeem *ith him during the month of February 1899 to coUect on behalf of the botanical Survey. In Bengal collections were made, in connection with handlists which the Director of ihe Survey proposes to issue, in various districts ^at are not yet adequately botanically surveyed, and with the aid of Mr. G. A. Gammie, an interesting collection of fruiting specimens was obtained from the Eastern Himalaya. The Director was further able to depute Mr. Gage, the Curator of the Calcutta Herbarium, to the South Lushai Hills, a region that *s botanically quite unknown, from 15th [March 1899. Major Shakespeare,

C.I.E., and the other officers of the Lushai Hills gave every assistance to Mr. Gage, the results of whose deputation will have to . be fully dealt with in the Annual Report for 1899-1900.

2. *Survey of Northern India.—The* Report for 1898-99, prepared by Mr. Duthie, who was in charge of the department throughout the year, is submitted in original. His duties have, as usual, included those of instruction and examination at the Forest School, Dehra Dun, those of inspection of Government Gardens, Parks and Reserves in the North-West Provinces, and that of a visit to Calcutta to compare with the material in the Herbarium of the Royal Botanic Garden, the critical plants obtained during the year by the native collectors working under him. Their collections have been mainly obtained with reference to the "Flora of the Upper Gangetic Plain" on which Mr. Duthie is closely engaged and which continues to make satisfactory progress, and with reference to the proposed " Flora of the Punjab Plain and Rajputana." In connection with this matter it seems necessary to advert to a belief which appears to prevail in many quarters, that there is little left to be done as regards the botanical investigation of the territories under the rule or the protection of the Government of India. The discoveries of Mr. Duthie's collectors in Rohilkund, North Oudh and Gorakhpur during the past year are alone a sufficient proof that this belief is very far from being justified. But they only confirm for the Upper Gangetic plain the experience of the former and the present Director of the Survey as regards the Lower Provinces. Nor is there room for doubt that what is true of Upper India is true of Central, Western and Southern India as well. As regards Southern India in particular, the probability, based on the past history of botanical exploration there, is that more has yet to be done than remains to be done in Northern India. The prevalence of the belief is to be deprecated because of two undesirable results that have followed it. The first of these is a very unfortunate one. In the early days of British rule in India, intelligent officers of the civil executive, soldiers and medical men took the greatest interest in the botanical resources of the country and rendered much spontaneous and hearty assistance to Kyd, Roxburgh, Wallich and the other early heads of the Indian Botanical Department. Now, with a few notable exceptions, sufficient only to prove the rule, nothing is done spontaneously to assist the department. Doubtless this is largely due to the fact that official duties occupy now, more than at any previous period in the history of British rule in India, the greater part of any officer's time. But that this is not the whole explanation is shown by the fact that a few officers of Government and a few private gentlemen do still give the department the valuable help recognised in this and other Annual Reports of the Botanical Survey. The second result of the belief is a much more serious one, for it has led to the erroneous supposition that an accurate botanical survey of a particular area can be completed within a definite and very limited period.

3. *Survey of the Bombay Presidency.*—Mr. G. Marshall Woodrow was in charge of the department throughout the year. He retired almost immediately after its close and has therefore submitted no annual report. The Director understands that Mr. Woodrow's efforts were chiefly concentrated on the Dang country, but that owing to difficulties due to the state of the public health his native collectors were unable to obtain very satisfactory collections.

4. *Survey of Southern India.*—For the fourth time in succession no annual report has been submitted from this Survey. The organisation of the Botanical

Survey, generally approved of in India Office Despatch No. 53 (Rev.) of 21st July 1887, was sanctioned as to details in India Office Despatch No. 17 (Rev.) of 13th February 1890. By the arrangement that then met with the approval * of the Right Honourable the Secretary of State for India, which the Governaient of Madras had previously accepted, and had expressed to the Government of India its willingness to co-operate in carrying out, the Botanical Survey of Southern India was placed in charge of the Madras Government Botanist. The Director was authorised to ascertain, on the occasion of his deputation to Madras in January and February 1899, whether the newly appointed Government Botanist at Madras had assumed charge of his duties and if so, to consult with him as to the most suitable programme of work for the ensuing year. During his visit the Director made the acquaintance of the newly appointed Government Botanist. The matter, however, ended there. The Government of Madras appears not to see its way to carrying out the agreement entered into by it with the Government of India, and approved by the Right Honourable the Secretary of State. At all events no official intimation has been received by the Director that the Madras Government -Botanist has assumed charge of his duties as an officer of the Survey ; no report has been submitted regarding the work, if any, done during the year 1898-99; no programme has been submitted detailing the work that it is intended to do during 1899-1900.

5. *Publications.*— Since the submission of the report for last year the three papers then described as ready for issue have been distributed by the Superintendent of Government Printing. During the year under review another paper has been prepared for the *Records of the Botanical Survey* and is now passing through the press. This paper, which forms No. 12 of the **series, consists of a *Report on a Collection of Mosses made by Dr. T. L. Walker in Coorg during the cold weather of 1897-98,* and has been drawn up by** Dr. V. F. Brotherus of Helsingfors. Mr. Woodrow has continued his Catalogue °f plants of Western India ; it is given as an appendix to this report.

6. *Economic and Agricultural Botany,*—The study fcf the Leguminous crops of Bengal on which the Director is engaged has not yet come to an end. !n conjunction with the Inspector-General of Forests he is engaged in collecting material for an authoritative report on the trees of the species °f *Ptrrocarpus* that yield the timbers known as padouk and Andamans red-wood. For the benefit of the Reporter on Economic Products and of the Central Indigenous Drugs Committee he has cultivated and identified the sources of a number of drugs and economic products the origin of which has hitherto been doubtful. On behalf of the Directors of Land Records and Agriculture, Madras and Bengal, an exhaustive examination has been made of a very large series of specimens of diseased sugar-cane sent by them for investigation. The necessary reports were duly placed in the hands of these officers. In connection with this important enquiry the Director has to .acknowledge the great assistance rendered by Lieutenant Gage, Curator of the Calcutta Herbarium.

7. *Staff.—The* officer in charge of the Survey of Western India intimated his intention to retire shortly after the close of the year. An effort was conjointly made by the Government of Bombay and by the Director of the Botanical Survey to induce Mr. Woodrow to reconsider his domination, ** without success, The newly appointed Government 'Botanist, Madras, reached

India before the close of the year. As, however, the Bombay officer did not retire till after the close of the year, and as the Madras officer has not commenced the discharge of his duties, no change in the staff has to be recorded. The Director of the Botanical Department, Northern India, and the Director of the Survey held charge of their respective departments throughout the year.

DAVID PRAIN, ***Major, I. M. S.,***

Director, Botanical Survey of India*

Annual Eeport of the Director of the Botanical Department, Northern India, for the year 1898-99.

I left Saharanpur on the 11th of April to join the Forest School camp at Konain, beyond Chakrata, and travelled with them as Botanical Instructor through portions of Jaunsar and Tihri-Garhwal till about the end of May. I arrived at Mussoorie on the 8th of June, and remained there till the end of September. On the 1st of October I left Mussoorie for Saharanpur, where I was stationary till the 4th of February. On the 5th of that month I went to Lucknow to inspect the Govérnment Garden and Parks, and on the 15th to Agra to inspect the Taj Garden. On the 23rd I left Saharanpur for Calcutta to pay my annual visit to the Royal Botanic Garden, halting on my return journey at Cawnpore on the 5th of March to inspect the Juhi dsar reserve, and thence to Unao to see the new babul plantation at Abbaspur. I inspected the Gursikran dsar reserve, near Aligarh, on the 12th, and on the 21st I went to Dehra, where I remained till the 31st to assist at the Forest School Final Examination.

B01AMCAL ToiJKS.

Eohilkhand, Northern Oudh and Gorakhpur.~The two parties of plant collectors who left Saharanpur in March Ib98 to collect botanical specimens in the forest tracts of the above-mentioned districts, returned to head-quarters at the commencement of the rainy season. They collected between them about IJOOO species, also seeds of a large number of trees and shrubs for sowing in the Saharanpur Garden. The collections include several very interesting plants, tor many of them/had not been previously recorded for that part of India, whilst others had not been collected since they were originally discovered by -Buchanan-Hamilton and others many years ago.

Jannsar and Tihri- Garhwal.—During my tour last year with the Forest School students advantage was taken as usrual to explore the botany of that portion of the Western Himalaya. I hope shortly to be able to put on record the results obtained during this and all previous tours undertaken in Jaunsar and Tihri Garhwal.

2 *he Hei lariitm**—The additions to the herbarium during the past year have been very considerable. The largest contribution represents the results of my plant collectors' work in Pilibhit, North Oudh, and Gorakhpur.

The following is a list of other collections received :—

1. *From the Royal Botanic Garden, Calcutta.*—Fifty-six sheets of mounted specimens.
2. *From J. &. Lace, Msq, Deputy Conservator of Forests, Ckamba.*—> One hundred and ninety-nine species of plants from the Chamba State.
3. *From Babu Vpendra Nath Kanjilah Imperial Forest School, JDehra.*—Seventy species from the Forest School Circle.
4. *From J. Sykes Gamble, Esq., C.LM, F.B.S., etc.*—Specimens of flowering plants and mosses from Dehra Dun and Jaunsar.
5. *From P. W. Maehinnon, JEsq.—K* fine collection of plants from Mussoorie and Dehra Dun, including some new and rare orchids.
6. *From Captain E. C. Hare, 1.3J.S.*—Further collections of plants from the Samana range on the North-Western Frontier.

7- *From Captain Milne, I.M.S.*—Further collections of plants from the North-Western Frontier.

8. *From Colonel Wright, I.M.S., D.S.O., Captain Rarriss, I.M.S., and Colonel Mainwaring.*—Several specimens collected in the neighbourhood of Chitral and Kila Drosh.

9. *From Captain Fraser, JI%M*—Collections of mosses, including a few new species, from Upper Burma and Manipur.

10. *From Mr. W. Bell.*—Two species of New Zealand mosses.

11. *From Dr. E. Bosemtock, Gotha.*— A collection consisting of 281 beautifully prepared European specimens, including a large number of ferns.

12. *From Mr. J. Marten (Forest Survey).*—Eurther collections of ferns from the Chamba State.

Indian Mosses.—The collection of mosses in the Saharanpur herbarium has increased very considerably within the past few years ; and as nearly all the specimens have been examined and identified by Dr. Brotherus of Helsingfors, the collection is of great value as a means of reference. The North-West Himalayan region, including the districts of Hazara, Kashmir, Jaunsar, Dehra Dun, Garhwal, and Kumaon, is very richly represented.

The Orchids of North-Western India.—After the publication of the magnificent work on the Orchids of the Sikkim Himalaya in Volume VIII of the Annals of the Royal Botanic Garden, Calcutta, it was proposed by Sir George King that the orchids of other parts of British India and Burma might be similarly represented in future volumes of the Annals. Acting on this suggestion, I made arrangements during last summer at Mussoorie to have drawings made and descriptions prepared from living specimens of orchids obtainable in the neighbourhood of Mussoorie and from Dehra Dun, and that had not already been figured and described in Sir George King's and Mr. Pantling's volumes of the Sikkim orchids. I was much assisted during my investigations by my friend Mr. P. W. Mackinnon, from whom I obtained specimens of the majority of the species enumerated in the following list.

Species of which drawings and descriptions are ready for publication :—

Liparis rostrata, *Reichb.f.*
Calanthe pachystalix,.R<?7cA£. *f.*
„ plantaginea, *Lindl.*
Eulophia Mackinnoni, *Dulhie, n.sp.*
„ explanata, *Lindl.*
„ n. sp. alliel to E. campestrid, *Wall.*
•Cymbidium n.sp. (allied to C. cy peri folium, *fFalL)*
Pogonia Juliana, *Wall.*
„ carinata, *Lindl.*
Habenaria digit at a, *Lindl.*
„ Susannae, *Br.*
„ pectinata, *Don {true.)*
„ commelinifolia, *Don.*
„ pubescens, *Lindl**
„ marginata, *Colehr.*
f| Aitchisoni, *Reichb.* /.
„ (Platanthera) acuminata, *Lindl*
„ Galeandra, *Benth.*
„ Elisabethte, *Duthie, n. sp.*
Hemipilia cordifolia, *LindU*

Species of which drawings and descriptions will be taken in hand during this summer:—

Dendrobium alpestre, *Royle.*
„ Gamblei, *King and Pant-ling.*
„ normale, *Falc,*
Eria alba, *Lindl.*
Eulophia flava, *Hook. f.*
Herminium Monorchi6, *Br.*
„ gramineurn, *Lindl.*
Habenaria intermedia, *Don.*
„ Lawii, *Hook, f.*

LOCAL FLORAS.

The following works dealing with plants occurring within the area allotted to the Botanical Department of Northern India are now in preparation.

The Flora of Simla, by Colonel Sir Henry Collett, *K. C* B. : - A descrcp. tive list of aU the flowering plants and vascular cryptogams found in the neighbourhood of Simla. This hand-book, containing numerous excellent illustrations, will be extremely useful, not only for the residents at Simla, but also at all hill stations between Murree and Naini Tal.

The Ferns of Northern India, by 0. *W.* Hope :- A complete list of all the species known to occur within the area defined by the author. -Parti, which has already appeared in Volume XII of the Journal of the Bombay Natural History Society, is introductory; Part II wiU contain descriptions with plates of all the new species; and in Part III will be found a list^of a.1 the species arranged as in the « Synopsis Filicum » of Hooker and Baker, with references and localities.

The Flora of the Upper Gangetic Plain.-Keys to and descriptions of genera up to the end of Leguminosse have been prepared, and I hope by the end of September to be able to finish the descriptions of all the species up to the end of Calyciflorse. The large collections received last year from the forests of Pilibhit, Northern Oudh, and Gorakhpur supplied much additional material for the flora, and a good deal of my time during last cold weather was taken up in determining the species.

A Manual of the Flora of the Forest School Circle, by Baboo Upendronath Kanjilal, Instructor at the Dehra Forest School. This work, which is primarily intended for the use of the Forest School students, will give descriptions of all the trees and shrubs occurring within the limits of the School Circle, and will include Dehra Dun and the Siwalik range as we 1 as ***£*%£ region within Jaunsar, and the lhiC-Garhwal leased forests J Jj ^ ^ r f Valley. The work will be remarkable as representing the first production of its kind written by a native of India.

DISTRIBUTION.

J & r M . ^ ^ . - Duplicates of herbarium specimens were sent to : -

The Herbarium, Royal Botanic Garden, Calcutta.
The Royal Herbarium, Kew Gardens. Kensington
The Botanical Department (British Museum), South Kens,n,tor,
The Royal Botanic Garden, Edinburgh.
The Royal Botanic Garden and Museum, Berlin.
The Botanic Garden and Museum, K. K. University, Vienna.
The Imperial Gardens, St. Petersburgh.
R. Instituto Botanioo, Florence.
Professor A. Blytt, Christiana, Norway.
The Botanic Garden, Durban, Natal.
P. W. Mackinnon, Esq., Mussocrie.
III. Copineau, Doullens, France i

Dr. Brotherus, Helsingfors (Mosses).
J. Sykes Gamble, Esq., C I E, F.R.S. (Mosses).
F. Lamson-Scribner, Agrostologist to the United States Department of Agriculture (Grasses).
Dr, George Watt, C. I. E. (Economic plants).
C. W. Hope, Esq. (Perns).
Dr. E. Bosenstock, Gotha (Ferns).

OFFICE ESTABLISHMENT.

My draughtsman, H. Hormusji, has made several excellent coloured drawings of Himalayan orchids and of many other plants of which figures were required. His services were again utilized by the Department of Land Records and Agriculture, North-Western Provinces and Oudh, in the preparation of a large number of coloured drawings of different varieties of sugarcane*

The Head Clerk (TJmrao Singh) and the Assistant Clerk (N. Hutchinson) have done very good work during the year. As there is no officer of my department specially appointed to undertake herbarium work during my absence from Saharanpur, I can always manage to keep my two clerks fully employed in the herbarium after the daily routine work of the office is finished.

MTJSSOOIUE ; ^

J. F. DUTHIE,
Director, Botanical Department,
Northern India.

The 24lh June 1899.)

APPENDIX No. I.

Financial Statement of the Botanical Department, Northern India, during the year 1898-99.

BOTAinCAL DhPABTMENT.	ExPiiNDITUBE.							RECEIPT.			
	Director's salary.	Exchange Compensation Allowance.	Establishment.	Travelling allowance of Gazetted Officer.	Travelling allowance of Establishment.	Contingencies.	Total.	Fodder Grass books.	Fodder Grass albums.	Miscellaneous.	Total.
	R a. *p.*	*H.* *a.* *p.*	£ *a.* *p.*	£ *a.* *p.*	& *a.* *p.*	*R* *a.* *p.*	*R* *a.* *p.*	£ a. *p.*	& a. *p.*	*H* *a.* *p.*	£ a. *p.*
Budget Grant for 1898-99	12,000 0 0	1,200 0 0	4,070 U 0	1,700 0 0	300 0 0	2,240 0 0	21,510 0 0	.....	.....	.....	.....
Expenditure during 1898-99	12,000 0 0	777 12 2	4,067 14 9*	1,659 9 0	299 6 6	2,208 10 4	...	.....	.....	.....	
Ealance	...	422 3 10	2 1 3	40 7 0	0 9 6	31 5 8	...	.....	.....	.....	.....

• Includes B54 paid for deputation.

MUSSOOKIE ;
The Ulh June 1899.

J. P. DUTHIE,
Director, Botanical Department, Norther7i India,

APPENDIX NO. II.

Some of the more important additions to the Library.

Annals of Botany, Volume XII.
Botanical Magazine, Volumes XXIX—XXXV, and LIV and LV.
Britton and Brown, Flora of the Northern United States and Canada, Volumes I—III.
Engler and Prantl, Pflanzen familien (several Parts).
Flora of Tropical Africa, Volume VII, Part I.
Gandoger, Flora Europse, Volumes I—XXVII.
„ also several other pamphlets on European botany.
Gardener's Chronicle, Volumes XXIII and XXIV.
Hortus Boissierianus, 1896.
Indian Forester, Volumes XXIV and XXV.
„ Gardening, Volume IV.
Kew Bulletin, Nos. 133—144, with Appendices I-II.
King and Pantling, Some New Indo-Malayan Orchids, 1897.
King and Pantling, Orchids of the Sikkim Himalaya (Annals of the Royal Botanic Garden, Calcutta, Volume VIII, Parts I—IV).
Knowledge, Volume XXII, Nos. 159—161.
Lisboa, liist of Bombay Grasses aud their uses, 1898.
Paris, Index Bryologicus, Part IV.
Prain, Note on the Mustards cultivated in Bengal.
Records of the Botanical Survey of India, Volume I, Nos, 9—11.
Report on the Proceedings of the Pamir Boundary Commission, 1897.
Richter, Plant* Europese, Volume II, Fasc. 2.
Scribner, F. Lamson, Studies on American Grasses.
Thacker's Indian Directory for 1899.
Trimen, Hand-book of the Flora of Ceylon, Part IV, with plates.
The True Grasses (Hackel), translated by F. Ijamson-Scribner and E. A. South worth, 1896.
Year Book of the United States Department of Agriculture, Washington, 1898.

MUSSOOBIE; -\
The 24th June 1899. >

J. F. DUTHIE,
Directory Botanical Department,
" -Northern lnd%a.

Iteport on the work of the Botanical Survey, Bombay, for the year 1897-98.

APPENDIX.

THE FLORA OF WESTERN INDIA.

BY G. MARSHALL WOODROW, PROFESSOR OF BOTANY, COLLEGE OF SCIENCE, POONA.

*(Continued from Appendix 1 of Annual Report for 1897*98.)*

PART III.

LXXIX.—GOODENOVIE2E.

1. *Sccevola.*

S. Kcemgii, *Vahl.*, F.B.I.—III-421. *BUdruJc.* — **Ratnagiii. June-Dee.**
S. lobelia, *Linn.*, F.BJ.—III-421. — **Karachi.**

LX XX,—CAJIPANULiOE-E.

Isotoma {Extra Indian).

I. longiflora, *Presl.*, prod. lob./. 42. — **Garden weed. Aug -Sept.**

2. *Lobelia.*

I»- trigona, *Boxb.*, F.B.I.—II1-423. — **Panchgani, Narel. Aug.**
t trialata, *Ham.*, F.B.I.^II 1-425. — **Ambegbat. Mababl. July-Nov.**
L. mcotianifolia, *Heyne*, F,B.I.—III-427. — ***Datval, Bokenul.* W. Ghats. Jan-**

3. *Cephalostigma.*

C. Scbimperi, *HocJis.*, F.B,I,—111-428, — **Pancbgani, Adur. Dbarwar, Nov.-Dec.**
C fiexuosum, a-/. ^ *T.*, F.B.I.—III-428. — **Biicbi, N. Kanara. Nov.**

4. *Wahlenbergia.*

W- graoilis, *DC*, F.B.I.—III-429. Iwrf/, — **Lanauli. Khandala. Feb.**

11. *Splienoclea.*

S' zeylanica, *Gaert.*, F.B.I.—111-438. — **Vingorla. Kaljan. Bubak, Sind. Oct.-Dec.**

13. *Campanula.*

0. Alpbonsii, ^"a;/., F.B.I.—111-440. — **Sbinghad. Dang. Oct.**

LXXXVL—PLUMBAGINE^:.

3. *Statice.*

s- Stocksii, *Boiss.*, F.B.I.-III-480. — **Verawal, Sind. Dec.**

4. *Plumbago.*

p- zejlanica, i«‹»., FB.I.,—III-480. *Chitral.* — **Dewan Hills. Aug.-S«pt**
P. rO8ea,i8ww.,P.BiIt_III.48L *Lalchitrak.* — **Cultivated.**
p- capensifl, *Tfanb.*, prod, f 1. cap.-1-83. *Kala chitrak.* — **Cultivated. May-Dec.**

6. *Vogelia.*

v- indica, *Gibson.*, F.B.I.—Ill-481, — **Abu, Porebunder. Dec.**

LXXXVII.—PBIMULACEiE.

7. *Anagallis

A. arvensis, *Linn.*, F.B.I.—III-60C. — **Deccan, widely. Sept.-Dec.**

8. *Centunculus.*

C tenelluB, *Duby.*, F.B.I.—III-506. — **Poona, Au^***

LXXXIIL—MYBSIKBJB.

1. *Mas a.*

M. indica, *Wall.*, F.B .i.—II1-509 *Aitan.* — Mahablesbwar. Dec-Jan.

2. *My r sine.*

M. eapitellata, *Wall.*, S.B.I.—III-512. Santaveri. Dec-

3. *Emlelia,*

E. Ribes, *Burm.*, F.B.I.—III-573. *Waiwarung,* TV. Ghata
E. robusta, iforS., F.B.I.—III-515. *AmbatL* Katrir Ghat. Aug.-Api.
£. viridifolia, toAe/., F.B.I.—II1-516. *Ambut.* Oct.-Jan.

5. *Ardisia.*

A. humilis, *Vahl.*, F.B.I.—111-529. *Bugdi, Dikna.* Castle Rock, Ambooli. Aug.-Dec.

10. *JEgiceras.*

JE. majus, *Gaertn.*, F.B.I.—111-533. *Kanjala.* Mombra, near Thana. Feb.

LXXXIX.—SAPOTACEJB.

1. *Chrysophyttum.*

Q. Roxbu-rghii, £. /)o»., F.B.I.—111-538. *Tarsi, JDongri myphul.* Khandalla. Aug.

3. *Sideroxylon.*

S. tomentosum, *Roxb.*, F.B.I.—111*538. *Katekumlal.* Mahabl. Matheran. Jan.

Achra.*

A. sapota, *Linn., DC.* Prod.—VIII-173. *Chikoo.* Cultivated.

5. *Dichopsis.*

I>. elliptica, *Benth.*, F.B.I.—II1-542. *P6nchotipdlld.* Bombay. Kanara *Dalzett.*

6. *Bassia.*

B. latifolia, *Roxb.*, F.B.I.—III-544. *Mowka.* Khandalla. Peint Taluk, Guzerat, wid
B. longifolia, *Linn.*, F.B.I.—544. *Ippi., Mowka.* Suligeri, N. Kanara. Jan.
B. malabarica, *Bedd.*, F.B.I.—III-544. Sumpkund, N. Kanara. Feb.

8. *Mimusops.*

M. elengi, *Linn.*, F.B.I.—III-548. *Bakuli.* Divimana Ghat. Feb.
31. hexaudra, JKojrft, F.B.I.—III-549. *Khirni.* Jooneer. Godra. Sept.-Oct.

XC—EBENACEJE.

1. *Maba.*

M. nigrescens, *Dalz.*, F.B.I.—III-551. *Dolali.* Ambooli Ghat, in fruit. Nov.
M. miorantha, *Stem.*, F.B.I.—III-552. Syhadree. *Dalzell.*

2. *Diospyros.*

D. pruriens, *Dah.*, F.B.X.—III-553.
D. montana, *Roxb.*, F.B.I.—111*555. *Govindu.* Chorla Ghat. *Dalz.* Cool season.
D. Kaki, i*w».s F.B.I—III-565. JPaH. Near Pan well.
D. embryopteria, *Pers.*, F.B.I.—III-556. *Timburi.* Cultivated Bombay, rarely.
D. Ebenum, *Koenig.*, F.B.I.—III-585. Salsette.
D. assirailis, *Bedd.*, F.B.I.—III-558. u45w«*, *Malia.*
I), sylvatica, *JBoxb.*, F.B.I.—III-559.
D. microphylla, *Bedd.*, F.B.I.—III-559. Thana. Matheran (Telgiri, *Talbot).* Feb.
D . chloroxylon, *J2oxb.*, F.B.I.—III-560. *JVinie.* Yellapur. Mar.
D. oocarpa, *TJiwaites*, F.B.I.—III-66O. Peint Road, 6 miles N. of Nasik, in fruit. Apl.
D. Tupru, *Buch.-Ham.*, I.B.I.—III-563. *Temburni.* Divimana. Tbana. Feb.
D. panioulata, *Dalz.*, F.B.I.—III-57O. Behar Tank, in fruit. June.

n. „ „ . , „ . Chorla Ghat and E«ghur. Cool season. *BaU.* Devimana. Feb.

XCI.—STTBACEJE.

1. *Symplocos.*

S. spioata, *Boxb.*, F.B.I.—III-573.
S Beddomei,C.J?.e.,F.B.i.^III-582. *Lenda, Lodhra.* Castle Rock. Oot.-Dec.
Mahableshwar. Jan.

XCIL—OlBACEiB.

1. *Jasminum.*

J. Sambac, *Ait.*, F.B.I.—111-591. *Mogra.* — Gardens.
J. pubescens, *Wild'*, F.B.I.—III-592. *Ban Mogra** — Mombra, near Thana. Feb.
J. arboresceDS, *Boxb.*, F.B.I.—IIL-591. *Kusar, Kundi.* — Chandawar. Aug.
J. Kitehiei, *Clarice*, F.B.I.—III-598. — Castle Rock. Chandawar, N. Kanara. Ang.
J. auriculatura, *Vahl.*, F.B I.—III-600. — Badami. Nov.
J. flexile, *Vahl.*, F.B.I.—III-601. — Kumpta to Sixsi Road. Mar.
J. offioinale, *Linn,,* F.B.I.—III-603. *Jai.* — Cultivated.

2. *Nyctanthes.*

N. arbor-tristis, *Linn.*, F.B.I.—111*603. *Sir ally Para; at ak.* — Fal jungles. Aug.

3. *Sehrebera.*

S. swietenioides, *Boxb.*, F.B.I.—III-604. *Mohka.* — Bhowdan. Poona. Samasgi. Dharwar. Apl.-May.

6. *Osmanthus.*

0. fragrane, *Lour.*, F.B.I.—III-606. — Gardens. Cultivated.

7. *Linoeiera.*

L. malabaricum, *Wail.*, F.B.I.—III-6O7. *Haedi.* — Lanaulù Amba Ghat. Nov.-Apl.
L. intermedia, *Wight*, F.B.I.—111-609. var. Eozburghii. — Lanauli. Apl.

8. *Olea.*

O. dioica, *Boxb.*, F.B.I.—III-612. *Parjamb, Karambu.* — Khandalla. Jan.-May.
O. cuspidata, F'aW., F.B.I.—III-612. *Baku, Kan, SAtcan.* — Planted.

9. *Ligustrum.*

L. neilgherrieuse, *Wight*, F.B.I.—III-615. — Mahableahwar. Aug. -Oct.

XCIII.—SALTADOBACB^.

2. *Salvadora.*

8. persica, *Linn.*, F.B.I.—III-619. *Pilva, Kahhana.* — Gogo. Bijapur. BuUar. Deo.-Feb.
8. oleoides, *Dene.*, F.B.I.—III-62O. *Khabburjhar, Diar.* — Nadiad* Sind. Jan.

3. *Azima.*

A. tetracantha, *Linn.*, I.B.I,—III-620. *Sukkaput, Kundali.* — Badami. Adur. Dharwar.

XCIV.—APOCYNACE^.

6. *Carissa.*

C Carandas, *Linn.*, F.B.I.-III-63O. *Karwand.* — Earavanta. Khandalla. Feb.-Mar.
C. spinarum, *A.D.C.*, F.B.I.—111-631. — Badami. May-June.
C. maorophylla, *Wall.*, F.B.I.—III-631. — Hills near Ear war. Jan.-Feb.
C Buavissima, ^c?c?., F.B.I.—III-631. — N. Kanara. *Talbot.* Jaa.-Feb.

7. *Bauwolfia.*

R. serpeotina, *Benth.*, F.B.I.—III-632. *Radahi.* — Castle Rock. Aug.-Jan.
R. denaifloTa, *Benth.*, F.B.I.—III-633. — Mahableshwar.

Thevetia.

T. neriifolia, *Juts.*, *DC.* Prod.—VI11-343. *Peoli Kunnar.* — Planted. Jan.*Aug.

10. *Cerbera.*

C. Odollam, ^a^w., F.B.I.—III-638. *Odolam, Sukanu.* — *AnanU* S. Konkan. June-Jan.

13. *Bhaxya.*

R. stricta, D.CiV., ».B.I.-1II-640. ^war, *Siharisworg.* — Sehwan, Sind. Dec.

14. *Vinca.*

V. pusilla, Jftfrr., F.B.I.—III-640, *Sangkhi, Sankaphù* — Poona. Guzerafc, widely. June-Sept.
V. rosea, *Linn., sp. pi.*—305. *Sadafuli, Baromashi.* — Cultivated.

14. *Plumeria.*

. acutifolia, *Poir.*, F.B.I.-III-641. *Eeir champa. **Cultivated.**
F. alba, *Linn., DC.* Prod.—VIII-392. **Cultivated.**

16. *Alstonia.*

A. scholaris, *Brown.*, F.B.I.,-111-642. *Satavin.* **Near Lanauli.**
A. macrophylla, *Wall,* F.B.I.-III-643. **Cultivated.**

18. *Eolarrhena.*

H. antidysenterica, *Wall,* F.B.I.-III-644. *Doivla kuda, Indrajar.* **Kbandala. Mar.**

19. *Tabernamontana.*

T. Heyneana, *Wall.*, F.B.I.—III-646. *Nagal Kuda.* **Sirei. Apl.**
T. coronaria, *Br.*, F.B.I.—Ill-646. *Taggar.* **Cultivated.**
T. crispa, *£oxb.*> P.B.I.—III-448. *Nag kuda.* **Matheran. Castle Rock. Marmagoa-**

20. *Parsonsia.*

P. spiralis, *Wall.*, F.B.I.-III-650. **APriL**

21. *Vallaris.*

V. Heynei, *Spr.*, F.B.T.—III-650. **Jagalput, N. Kanara. Feb.-Mar.**

23. *Wrightia.*

W. tinctoria, *Br.*, F.B.I.—III-653. *Kala kuda.* **W. Ghats, Tbana. May-June.**
W. tomentosa, *Eoem. # Schvlt.*, I.B.I.—^111-653. **Dang. Sawantwady.**

24. *Nerium.*

N. odorum, *Soland.*, S.B.I.—IIL655. *Kariher.* **Deccan. Bind, widely planted. Apl.-Mar.**

BoupeUia.

R, grata, *Wall,* Bot., Mag., 4466. **Gardens. Mar.**

29. *Beaumontia.*

B. grandiflora, *Wall P.B.r.—III-66O.** **Cultivated. Dec.-Feb.**
B. Jerdoniana, *Wight,* F.B.I.—III-661. **N. Kanara. Nov.-Pec.**

30. *Chonemorp7ia,*

C. maoropbylla, *G. Don.*, F.B.I—III-631. **Divimana. May.**

33. *Aganosma,*

A. oaryopbyllata, *a. Don.*, F.B.I.—111-664. *Malati, Kemettivalli.* **Ganesbkbind. Gardens. Aug.**

37. *Anodendron.*

A. panicnlatum, *A.D.C.*, F.B.I.—111-668. *Lamtanu* **Lonauli. Dec-Mar.**

38. *Ichnocarpus.*

I. frutescens, *Br.*, F.B.I.—III-669, *Kristnasarwa, kantebouri.* **Castle Eock. Sirsi. Nov.-Deo.**

Adenium.

A. obesum, *Bam, et Sch., DC Prod. V.—III-412. *Adenachakanher.*** **Poona. Cultivated. Mar.-Apl»**

XCV.—AsCLBPIADBiE.

2. *Hemidesmus.*

H. indicus, *Br.*, F.B.I—IV-5. *Vpalsari, Anantamul, Dudhbali* **Vingorla. Poona. Sumpkund- Oct.**

3. *CryptolepU.*

C. Bucbanani, *Bcem,*, F.B.I.—IV-5. *Karanta.* **Deccan, widely. Aug.**

3.* *CrypUstegia,*

C grandiflora, *Br»* F.B.I—IV-6. *Tilayati vakundi-* **Naturalised, widely. June-Sept.**

13- *Periploca.*

P. aphylla, *Dene.*, F.B.I.—IV-12. *Bansher.* Thano Bullo Khan, Sind. la fruit, Nor.

16. *Genianthus.*

G. laurifolius, *Hoohf.*, F.B.T.—IV-16. N. Kanara Ghats. *Talhot* Dec.

17- *Glossonema.*

G. varians, *Benth.*, F.B.I—IV-16. Sind. Dec.

18. *Oxystelma.*

0. esculentum, *Br.*, F.B.I.—IV-17. *JDudhi, Dudhani-* Poona. Sind. Dec.

19. *Calotropis.*

C gigantea, *Br.*, F.B.I.—IV-17. *Mandar, Bui.* Deocan. Guzerat, widely. Feb.-July.
C procera, *Br.*, F.B.I.—IV-18. *Bandar, Bui.* Poona. Sind, widely. Dec.

19.* *Asclepias.*

A. Curassavica, *Linn.*, F.B.I,.—IV-18. Karki. Poona. Kumta. Feb.-Dec.

22. *Pentatropis.*

£. spiralis, *Dene.*, F.B.I.—IV-19. *Ambaravels singarsta.* Lasalgaon. Hajam. Sind. Feb.-Nov.
P- mircrophylla, *Wight,* F.B.L-IV-20. *Parparum.* Dango. Gokak.

23, *Dcemia.*

D. extensa, *Br.*, F.B.I.-IV-20. *Utarana.* Poona. Sind. Aug.-Dec.

25. *Holotsemma.*

H. Rheedei, *Wall,* F.B.I.-IV-21. *Tultuli shindori.* Farel.-Aug.

26. *Cynanchum.*

C. pauciflorum, *Br.,* F.B.I.~IV-23. Jooner.-Oct.-Feb.
C. callialata, *Earn.*, F.B.I.-IV-24. Poona. Haveri. Apl.

27. *Sarcostemma.*

S. brevistigma, *Wight,* F.BI.-IV-26. *Konagulli.* *Somalata.* Poona. June,-July.

30. *Gymnema.*

?' y^{lve}stre, *Br.*, F.B.I.-IV-29. *Shirwhurunja.* Kavali. Mahabl. Sumpkund, N. Kanara. Apl.
*• Pergularioides, *Wt. # Gard.*, F.B.I.—IV-32, Haveri. Apl.

32. *Marsdenia.*

^- tenacissima, *Wight $ Arn.*, T.B.I.-IV-34. Champaneer. Poona. May.

33. *Pergularia.*

P. pallida, *Wight # Am.*, ».B.I.-IV-38.
P ' ^^.or, ^*.*, F.B.I.—IV-38. Cultivated.

34. *Stephanotis.*

S. grandiflora, DC. Prod.—VIII-620. (Madagascar.) Gardens.

36. *Tylopkora.*

T- fasciculata, *Earn.*, F.B.I.—IV-40. *Bhindodi* Wandra. Bank of Tansa Canal. Aug.
T. rotundifolia, flaw., F.B.I.—IV-43. Londa. June.
T- Dalzellii, *BCook*$f.$ F.B.I.—IV-43. Konkan. *Stocks, Law.*
T- asthmatica, *Wight,* F.B.I.—IV-44. *Jungli pikwan, Karaki rasna.* Lanauli. Gokak. Nov.

38. *Cosmostigma.*

C raceiposa, *Wight,* F.B.I.—IV-46. *Jati, Marvel, Shendari. Shendoel.* Konkan & N. Kanara. *Talbot.* June-Aug.

39. *Dregea.*

D. volubilis, *Benth.*, F.B.I.—IV-36. Mawa). Poona. ApL
Do. var. augnstifolia. ^Lohagaum. Poona. July,

O. urceolatus, *Benth.*, F.B.I.—IV-49.

42. *Oianthus.*

Poona. Aug.

H. retusa, *Dalz.*, P.B.I.—IV-56.
H. Wightii, *Hook. /.*, F.B.I.—IV-69.
H. pendula, *Wight*, F.B.I.—IV-61.

44. *Soya.*

Yaoombi, N. Kanara. July.
Sumpkund, do. do,
NearNagotna. Dalzell.

47- *Leptadenia.*

L. reticulata, *Wt. 8f Am.*, F.B.I.—IV-63. *Nakshikariu Harandori.* Deccan. Apl.
L. spartium, *Wight*, F.B.I.—IV-64. *Kip* (Sind). Sind, Mandwee. Dec

50. *Ceropegia.*

C. attennata, *Book.*, P.B.I.—IV-67. Hills near Jooneer. Sept.
C. Lawii, *Kook.f.*, P.BJ.—IV-67. *Kundtori.* Khandalia. Poorundhur. Aug.-Sep*.
C. bulbosa, *Boxb.*, F.B.I.—IV.-67. 10 miles, W.Poona. Aug.
C. juncea, *Boxb.*, F.B.I.—IY-68. *Kunwal.* Badami. Aug.
C. acuminata, *Boxb.*, P.B.I.—IV-70. Pasharo. Aug.
C. hirsuta, TT. ^ -4., F.B.I.—IV-71. Var. Jacquemontiana. *Hamana.* Poona. Aug.

51. *Frerea.*

F. indioa, *Dal*.9* F.B.I.—IV-76. *Shindal makudi.* Hill Fort, Jeener. Sept.-Oct

(A fleshy glabrous herb or undershrub 4"—6. Flowers |" diam.)*

62. *Caralluma.*

C. odnlis, *Benth.*, P.B.I.—IV-76. Mnlir, 6 miles from Karachi. Sept.
C. fimbriafta, B'aW., F.B.I.—IV-77. *MaJcadasingi.* Deccan hills, widely. May-June.

XCVL—LOGANIACEÆ.

1. *Mitreola**

M. oldenlandioidee, *Wall.*, F.B.I.—IV-79. Pali. Konkan. In fruit, Oct-

3. *Bud die ia.*

B. aeiatioa, *Lour.*, P.B.I.—IV-82. Fitzgerald Ghat. Jar.

4. *Fagraea.*

F. obovata, *Wall.*, F.B.I.—IV-83. Sumpkund, N. Kanara. July-

6. *Strychnos.*

S. colubrina, *Linn.*, T.B.I.—IV-87. *Kanal. Kajarbel.* Tunia Ghat. *TalboU*
S. Dalzellii, C7ar£e, P.B.I.—IV-87. Southern Ghat. *Dalzell.*
S. nux-vomioa, *Linn.*, P.B.I.—IV-90. *Kajra, Ka sarkano.* Ratnagiri. ^ar#
S. potatorum, itw»., P.B.I.—IV-90. *Nermali.* Pal jungles. In fruit, Feb.

XCVII.—G1NTIANE2B.

2. *Exacum.*

E. bicolor, *Boxb.*, P.B.I.—IV-96. Cowrie, 2fara *karait.* Mawal. Poona. Sept.
E. pedunculatum, *Linn.*, F.B.I.—IV-97. Mawal. Poona. Dharwar. Dec.
B. Lawii, *Clarke*, F.B.I.—IV-98. Mahableshwar. Oct.
E. petiolare, *Grisb.*, F.B.I.,T—IV-98. Matheran. Sept.

4. *Hoppea.*

H. fastigiata, CW&e, F.BJ.—IV-100. Raver. Khandesh. Poo»a. Oot,

5. *Enicostema.*

E. littorale, B/., F.B.I.— IV-101. CAo\t *karait, Kadvanai.* Sind. Guzerat. Dharwar. Oct.

6. *Erythraa.*

E. Roxburghii, G. J5cw., r.B.1.—IV-102. *Luntak.* Konkan. Deooan. Feb.-Apl.

7. Cause or a.

0. diffusa, *Br.*, P.B.I.—IV-103. Konkan. Deccaii widely. Oofc.
C deourrens, *Dalz.*, F.B.I.—IV-103. Poona. Kumta. Oct.-Nov.
C. concanensis, *Clarke*, P.B.I.—IV-104. Narel. Aug.
C. perfoliata, *Lamk.*, P.B.I.—IV-104. Karwar. Feb.

12. *Swertia.*

S. tetragona, *Clarke*, P.B.I.—IV-122.
S. corymbosa, *Wight*, F.B.I.—IV-126. *Kullihal.* Castle Book. Nov.
S. decussata, iVmwo, F.B.I.—IV-127. *Eadu, Kavadi.* Panohgani. Nov.-Jan.

15. *Limnanthemum.*

L. oristatum, *Grisb.*, F.B.I.—IV-131. *Kumudini.* Ponds. Deccan. Concan. Apl.-Sept.
L. indicum, *Thwaites*, F.B.I.—IV-131. *Kumud.* Guzerat Mawal. Apl.-Sept.

XCIX.—HYDBOPHYLLACBJB.

1. *Rydrolea.*

H. zeylanioa, *Vahl.*, P.B.I.—IV-133. *Popti, Keriti.* Mabad, Bulsar. Nov.-D ec.

C. BOEAQINEJ!.

1. *Cordia.*

C. Myxa, *Linn.*, F.B.I.—IV-136. J?o^^f *Qotdani.* Sakkar Pathar, Deocan. Mar.-Apl.
C obliqua, *Willd.*, F.B.I.-IV-137. *Mota lusura.* Londa. In fruit June.
C. monoica, *Roxb.*, P.B.I.—IV-137. Badami. Aug.
C. Rothii, i?oew^ *Schti* P.B.I.—IV-138. *Gondana.* Deesa. Deccan widely. Nov.
C. MacLeodii, *H.f. $ T.*9 P.B.I.—IV-139. *Dhaivana.* Mawal. Mar.

2. *Ehretia.*

E. laevis, *Boxb.*, F.B.I.—IV-141. *Dataranga.* Karwar. Malshiras. Bbowdan. Poona. Mar.

3. *Coldenia.*

C procumbens, *Linn.*, P.B.I.—IV-144. *Tripakshi, Tripanki.* Badami. Lanauli. Cot.

4. *Rhabdia.*

H. lycioides, *Mart.*, P.B.I.—IV-145. *Machim.* Deccau. N. Kanara streams. Oct«-Dec.

6. *Reliotropium.*

H- zeylanionm, Zamjfc., F.B.I — IV-148. Deesa. Badami. Karachi. Nov.-Jan.
H. ophioglossum, *Stocks*, F.B.I.—1V-149. Sind.
H. supinuni, Z^ww., P.B.I.—IV-149. Singhur. Poona. Dharwar. Mar.
H- calcarenm, ^ocjfc*, P.B.I.—IV-150. Sebwan. Hyderabad. Dec.
H. ovalifolinm, *Forsk.*, F.B.I.—IV-160 Penn. Poona. Jan.-Feb.
H. undulatnm, *Vahl.*, P.B.I.—IV-160. Karachi, Hyderabad, Sind. Deo.
H. Bottleri, *Lekm.*, P.B.I.—IV-151. *Daorfuli.* Sind.
H. panioulatum, *Br.*, P.B.I.—1V-161. Sind.
H« indicum, *Linn.*, P.B.I.—IV-152. *Burundi.* Ajeru Salt swamp, Bombay. Oct.-Nor,
H* peravianum, *Linn., Sp.* 189. Gardens.

7. *Trichodesma.*

T. indioum, P^., F.B.I.—1V-153. ^a^a *mendha.* Kalyan. Aug.-Sept.
T. amplexicaule^o^., P.B.I.—IV-153. Bijapur. Mnlier, Sind. Aug.-Jan.
T. africanum, *Br.*, P.B.I.—IV-154. Bulo Khan, Luki, Sind. Aug.
P- zeylanionm, *Br.*, F.B.I.—IV-154. Badami. Baroda. Sidashyagad. N. Kanara. Jan.

10. *Cynoglossum.*

C- lanceolatum, *Forsk.*, F.B.I.—IV-166. *LicKardi.* Poona. Panohgani. Oct.

13. *Parycaryutn.*

P- ccelestinum, *BentA.*, F.B.I.—IV-160. Mahableshwar. Oct.
£• xnalabarioum, *Clarke*, F.B.I.—IV-166. *Kala lichardi.* Mahableshwar. Oct.
*• Lambertianum, *Clarke*, P.B.I,—IV-161. Mahableshwar. Oct.
P» asporum, *Stocks.* Khirtur Mts. *H.MM. James.*

29. *Sericostomo.*

S. paucifloruin, *Stocks,* F.B.I.—IV-176. Broach. Palanpur. Vtraval. Nov.-Dec

30. *Amelia,*

A. hispidisBima, *DC,* F.B.I.-IV-l76. Mulier, Sind. Palanpur. Mar.

C I — CONVOLVULA0B2E.

1. *Erycibe.*

E. paniculata, *Boxb., var.* Wightiana, F.B.I.—IV-180. Castle Bock. Nor•

***Legendrea.* (Canary Islands.)**

L. mollissima, *Webb, DC.* Prod.-IX-828. Naturalised. Poona. Oot•

2. *Bivea.*

R. omata, *Chois.,* F.B.I.—IV-183.

R. hypocrateriformis, *Chois.,* F.D.I.—IV-184. *Phanji.* Mawal. Poona. Sept.

Mawal. Poona. Sept.

3. *Argyreia.*

A. speciosa, *Sweet.,* F.B.I.—IV-185. *Samudrasoke.* Gardens, Poona, Broach. Aug.

A. involucrata, *Clarke,* F.B.I.—IV-187. Collem. Wadi, near Mahableehwar. Oct.

A. involucrata *var.* inequalis. Marmagoa. Oct.

A. sericea, *Dalz.,* F.B.I.—IV-188. Dasgaon. Matheran. Aug.-Sept.

A* malabarica, *Chois.,* F.B.I.—IV-189. MahableBhwar. Aug.

A- pilosa, *Am.,* F.B.I.—IV-189. Yellapur. Sept.

A. cymosa, *Sweet.,* F.B.I.—IV-189. W. Gbat.

A. cuneata, *Ker.,* F.B.I.—IV-191. *Mahalungi.* Hills near Poona. July-Aug.

4. *Lettsomia.*

I*, aggregata, *Roxb.*> F.B.I.—IV-191.

L. elliptica, *Wight,* F.B.I.—IV-192.' *JBondwel.* Devikope. Samasgi. Dharwar. Dec-Jan.

L. setosa, *£oxb.,* P.B.I._IV-194. Mahableshwar. Sept.

Narel. Aug.

5. *Ipomceà.*

I. Bona-nox, *Linn.,* F.B.I.—IV-197. *Gulachandani.*

I. muricata, *Jacg.,* F.B.I.—IV-197. Cultivated.

I. grandiflora, *LamJc.,* F.B.I..—IV-198. Katriz. Poona. Sept.

I. trichosperma, *Illume,* F.B.I.—IV-398. Cultivated.

I. coccioea, *Linn.,* F.B^I.—IV-198. t harumpter. Cult. P Sept.

I. Qnamoclit, *Zinn.,* F.B.I.—IV-198. *G-anesh Pushpa.* Cultivated.

I, hederacea, *Jacq.,* F.B.I.—IV-199. Cultivated.

I. laciniata, *Clarke,* F.B.I.—IV-200. Cultivated.

I. dissecta, *Willd.,* F.B.I.—200. Sawantwadi. Aug.

I. oalycina, *Benth.,* F.B.I.—IV-201. Panohgani. Mahableshwar. Oot,

I. barlerioides, *Benth:,* F.B.I.—IV-201. Surat., Poona Satara Rd., 25th mile. Oct.

I. digitata, *Linn.,* F.B.I.—IV-202. Sirsi. Sept.

I. pentaphylla, *Jacrj.,* F.B.I.—IV-202. Kalyan.

I. Batatas, *Lamk.,* F.B I.—IV-S02. *Bitala, Sanangi.* Pal jungle. Baroda. Feb.

I. pileata, *Boxb.,* F.B I —IV-203. Sweet potato. Cult.

I. pes-tigridis, *Linn.,* F.B.I.—IV-204. Sawantwadi. Nov.

I. eriocarpa, *Bn,* F.B.I.—IV-204. *Kandoakle.* Ghat between Khad and Path. Sept.

I. sindica, *Staph., Kew Bull.* Kanali, Guzerat, Poona. Sept.

I. Stocksii, *Clarke,* F.B.I.—IV-204. Near Karachi,

I. angustifolia, *Jacq.,* F.B.I.—IV-205 I^eccan. Penil. *Stocks.*

I. tridentata, *Both.,* F.B.I.—IV-205. *Morga. Sendar Kalandi.* Karwar, Londa. Aug.-Dec.

I. ohryseides, *Ker.,* F.B.I.—IV-206. Nariad. Shrewardan. *Oat*

I. reniformis, *Chois.,* F.B.I.—IV-106. *Undirkani.* Bakor, Guzerat. Nov.

I. rumicifolia, *Chois.,* F.B.I.—IV-207. Poona. Deccan widely.

I. obscura, *Ker.,* F.B.I.—IV-207. *Pungali.* Karachi. Deo.

I. Clarkei, *Hook.f.,* F.B.I.—IV-207. Badazni. Poona. Guzerat. Oct.-Jan,

I, Bepiaria, *Koen.,* F.B.I.—IV-209. *Ambti-veL* Near Jooneer. Sept.

I. aquatica, *Forsh.,* F.B.I.—IV-210. *Nalichi baji. Tah a si.* Gokak Porebunder. Oct.

I. staphylina, *Boem.f Sch.,* F.B.I.—IV-210. Poona. Deocan, widely. Nov.-Apl-

I. campanulata, *IAmh,* F.B.I.—IV-211. *Tambanvail.* Byadgi. Deo.

Mawal, Poona. Dbarwar, Sept.-Jan,

I. cymosa, *Roem t #<;£.*, F.B.I.—IV-211. Ambegbat. Jan.
I. Turpetbum, *JSr.*, F.B.I.—IV-212. *Bur sing ali Ni&ottar*.* *Phutkari.* Revadanda. Oot.-Jan.
I. biloba, *Forsk.*, F.B.I.—IV-212. *Maryodvel.* Guzerat shores. Feb.
I. vitifolia, *Sweet.*, F.B.I.—1V-213. *Navli.* Castle Rock. Vingorla. Oct.-Nov.
I. pttosa, *Sweet,* F.B.I.—IV-213. Abmedabad. Dec.
I. sinuata, *Orteg.*, F.B.I.—IV-214. Guzerat. Nov.
L rhyncorhiza, *Dalz.*, F.B.I.—IV-214. Huttigberry, N. Kanara. July.
I. palmata, *Forsk.*, F.B.I.—IV-214. Badami.
I. dasysperma, *Jacq.*, F.B.I.—IV-215. Garden escape. Foona. Porebunder. Sept.-Nov.
I. tuberosa, *Linn., DC.* Prod., IX-362. Gardens.
I> carnea, <7acg, *Am.*, 26, $. 18. Cult. Gardens.
I. Horsfallise, *Hook., Bot. Mag.*, 3315. Cult. Gardens.

7. *Hewittia.*

H. bicolor, *Wight,* F.B.I.—IV-216. Sawantwadi. Mannagoa. Nov.

9. *Convolvulus.*

C. Bindicus, *Stocks,* F B.I.—IV-217. 12 miles east of Bullo Kban, Sind. Aug.
C. microphyllus, *8ieb.,* F.B.I.—IV-218. Hyderabad, Milir, Sind. Oct.
C. rhynoospermus, *Hochst.%* F.BI.—IV-218. Sind. Oot.
C. glomeratus, *Chois.*, F B.I.—IV-219. Karachi. Porebunder. *Deo.*
C. Rottlerianus, *Chois.*, F.B.I. -IV-219. Lenyadri. Jooneer. Sept.
C. arvensia, *Linn.*, F B.I.—IV-219. *Miranpag.* *Chandwel.* Jeur. Poona. Karachi. Dec.-Feb.
C. parviflorus, *Vahl.*, F.B.I.—1V-220. Dongargaun, near Abmednagar. Chandod, Guzerat. Nov.

10. *Evolvulus.*

E. alsinoides, *Linn.*, F.B.I.—IV-220. *Visnukranta, Sankaveli.* July-Nov.

11. *Porana**

P. paniculata, *Roxb.*, F.B.I.—IV-222. Bridal creeper. Gardens. Oot.
P. racemosa, *Roxb.*, F.B.I.—IV-222. Gardens. Oct.
P. malabarica, *Clarke,* F.B.I.—IV-223. Near Panobgani. Oct.

12. *Breweria.*

B- cordata, *Bl.*, F.B.I.—IV-223. Marmagoa. Vingorla. Nov.
B. latifolia, *Benth.*, F.B.I.—IV-223. Malir, Siad. Verawal. Deo.

13. *Neuropeltis.*

N. racemosa, *Wall.*, F.B.I.—IV-225. Bankeri. Honaver, N. Kanara. Feb.

14. *Cressa.*

C. cretica, *Linn.*, F.B.I.—IV-225. *Kardi, Lona, Luna.* Konkan. Sind widely. Nov.-Feb.

15. *Cuscuta.*

C. reflexa, igoa;^, F.B.I.—IV-225. *Akasvel. Amaryel.* Hangal, D bar war. Jan.-Feb.
C. hyalina, *Roth.*, F.B.I.—IV-226. *Ambar.* Sind.
C cbinensiB, *Lamk.*, F.B.I.—IV-226. July

C1L—SOLANCE-E.

1. *Solanum.*

nigrum, *Linn.*, F.B.I.—IV-229. *Kangoni, Eoawat.* Poona. Bombay. Hyderabad, Sind. Sept.-Deo.
verbascifolium, *Linn.*, F.B.I.—IV-230. *Kutri.* Poono. July-Oct.
pubescens, *Willd.*, F.B.I.-IV-230. Badami. Aug.-Nov.
bigeminatum, *Nees.*, F.B.I.—1V-231. Mahablesbwar. Oct.
denticulatum, *Blume.*, F.B.I.—IV-231. Mahableshwar.
giganteum, *BL,* F.B.I.—IV-233. Mabablesbwar. Jan.-Mar.
ferox, *Linn.*, F.B I.—IV-233. 40 miles west of Belgaum. In fruit, Deo.-
torvum, *Swartz.,* F.B.I.—1V-234. July.
indicum, *Linn.*, F.B.I.—IV-234. Kbandalla. Mabableshwar. Sept.
Melongena, *Linn.*, F.B.I.—IV-235. *Bengan.* Brinjal. Cultivated.
coagulans, *Forsk.*, F.B.I.—IV-236. Near Karachi. Jan.-May.

S. xantbocarpum, *Sch. $ Wen.*, F.B.I.-IV-236. *Boringadl. Botingadi. Kandayri.* Decoan. Sind. Junt,

S. trilobatum, *Linn.*9 P.B.I.—IV-236. Badami. Dharwar. Guzerat, widely. Jan.
S. graoilipee, *Dene.*, P.B.I.—.IV-237. Mulir, Karachi, 9ind. Dec.-Jan.
S. tubero8um,Ziww., The Potato. *Batata.* Cultivated.

1.* *Lycopersicum* (America).

L. esculentum, *Miller*, F.B.I.—IV-237. *Walewangn.* The Tomato. Cult.

2. *Physalis.*

P. minima, *Linn.*, P.B.I.-IV-238. *Chirputi,* Poona. Ang.
P. peruviana, *Linn.*, P.B.I.~IV-238. Cape Gooseberry. Cultivated.

2* *Capsicum.*

C. frutescens,Ż»»»»,p.B.i.--lV.289. *Mirchi.* Cultivated.
C. minima, *Ro*b.*> P.B.I.-IV-239. *Lovungi mirchi.* Cultivated.
C grossum, *Wilid.*, w M J m . *Bopaiamircz* Cultivated.

3. *Withania.*

W. somnifera, *Dunal.*, F.B.I.—IV-239. *Godhaavada.* Karachi. Jooneer. Poona. Sept.
W. coagulan*h Dunal.*, F.B.I.-IV-240. *Punirband, Kaknaj.* Karachi. Dec.

4. *Lycium.*

L. batbarum, *Linn.*, F.B.I.—IV-240. Karachi. Porebandar. Nov.

7. *Datura.*

D. Stramonium, *Linn.*, F3.I.-IV-242. *Datura,* Deccan widely. June-Dec.
D. T ·—inn., F.B.I.—IV-242. *Kala datura.* Deccan. Guzerat. Sept.-Dec»
D), *Linn.*, P.B.I.—IV-242. Pooua. Sept.-Dco.
. arborea, *Linn.*, sp. 256. Mahableshwar. Poona. Planted. Oct.-Dec

10. *Hyoscyamm.*

H. muticus, *Linn.*, P,B.I.— IV-243. Khirtar Mts., Sind. Mar.

10. *•fficoliana.*

N. Tabacum, *Linn.*, P.B.I.—IV-245. *Tumbaco.* Cult. Nov.-Feb.

CIIL—SOBOPHULABINBiB,

1. *Anticharis.*

A. glandulosa, *Aschers.*, ».B.I.—IV-249. Sind.
A. linearis, *Hochtt.*, P.B.I—IV-250, Sind.

3. *Cehia.*

C. coromandeliana, *Vahl.*, P.B.I.^IV-251.• *Baboor kutaki.* Deccan. Guzarat. Jan.-May-

4. *Linaria.*

L. ramosissima, TFJ//., F.B.I.—IV-251. Deccan widely. Sept.

5. *Schweinfurthia.*

S. sphnrocarpa, J. *Braun.*, P.B.I.—IV-252. Karachi. Dec

6. *Antirrhinum.*

A. majus,!»»»., sp. p., 859. Snapdragon. Gardens.

*Russeli*Mi (Mexico).

R. floribunda, JZwccar, 2). C, Prod.—X-332. Gardens.
B. rotundifolia, Cav., 2. C. ^.—V-9. Gardens.

10. *Sutera.*

S, glaaduloea, *Boxb.*> F.B.I.—IV-258. *BhuL* Karli. Poona* Feb·

11. *Mimulut.*

M. gracilis, *Br.*t P.B.L—IV-259. Poonft. Apl.

14, *Lindenbergia.*

h. irticsfolia, *Lehm.*, M A - I V . 2 6 1 . *Dhol.* Marmagoa. Baroda. Nov.

16. *Stemodia.*

S.riscosa,^5.t,.Bi^IV.266. Veraval. Ankleshwar. Nov.-Dec.
S.semta,^w^.,,.B.I.«iy.265. Penn. Callian. DecFeb.

17. *Limnophila.*

L. Koxburghii, *G. Don.*, F.B.I.-IV-265. Tnlknt Ghat. *Dalzell.* Sept. Kumta.
L. conferta, *Benth.*, P.B.I.-IV-266. Malwan. Dec.
L. pjacrhya,^w^.,r.B.i.-IV.266. N. Kanara. Jan.
t.heterophyUa,r.B.i_lv.27a Mahableshwar. Oct.
*• racemoBa, *Benth.*, P.B.I.-1V-271. Matheran. N. Kanara. Nov.-Jan.
**• gratioloides, *Br.*, P.B.I—IV-271. Mahablesbwar. Dakor. Penn. Nov.-Jan.

18. *Herpestis.*

fl.Monniera,5:j?.^x,».B.i.-IV.272. *Bama. Nirhrami.* Dec'can. Sind. Oct.^Tan.
«. Hamiltoniana, *Benth.*, y.B.i.-IV-272. Malwan. *Dalzell.*
H. floribxmda, *Br.* P.B.I.-IV-273. S. Kanara. Feb.

20. *Dopatrium.*

D. junceum, *Mam.*, F.B.I.-IV-274 Narel. N. Kanara. July-Aug.

23. *Torenia.*

T. cordifolia, *Rosb.*, P.B.I.^IV-276. Londa. Oct.
It asiatica» L*TM.> F.B.I.^IV-277. Cultivated.

24. *Vandellia.*

•• ornstacea, *Benth.*, P.B.L—IV-279. Narel. Matheran. Ang.
v- tirsnta, *Benth.*, P.B.I.—1V-28O. Kalyan. Sept.

25. *llysanthes.*

I-by8sopioides,B^A.,p.B.i.—IV-283. Guzerat. Mahableshwar. Nov.
*-parviflora,£e»a.,p.B.i.~IV-283. Narel. Belgaum. Aug.

26. *Bonnaya.*

3. brachiata, *Link. $ Otto*, P.BJ.—IV-284. Sawantwadi. Godra. Sept.-Nov.
B. veronieaefolia, *Spreng.*, P.B.I.—IV-285. " Common." *Dalzell.*
£• xeptans, *Spreng.*, P.B.I.—IV-284. s- Konkan. *DaUelU*
B- oppositifolia,^.«l^,P.B.i.-IV.286. Kalyan. Sept.

29. *Peplidium.*

P. humifusum, *Del.*, P.B.I.—1V-287. Bubak, Sind. Margoa. Dhurumter. Dec.

80. *Glossostigma.*

G. spathulatum. *Arm.*, P.B.I.—IV-288. Malwan. Nov.

34. *Scoparia.*

S. dulcis, *Linn.*, P.B.I.—IV-289. Sftlt swamp, Bombay. Nov.

36. *Campylanthus.*

C ramosissimus, *Wight.* F.B.I.—IV-290. Jungadi, Sind. Nov.

39. *Veronica.*

V. Anagallie, *Linn.*, P.BJ.~IV-293. :Deccan_ Mar_

41. *Buchnera.*

B. hiepida, *Linn.*, F.B.I.-IV.298. Koina Valley.

42. *Striga.*

S. orobanchoideB,J?eWa,p.B.i.-IV.299. Poonl1_ Dftkor* Matheran, Oct.
S. densifloxa, *Benth.*, P.B.L^IV.299. Poona# Jane-No7_
S. htea, *Lour.*, P.B.I.-IV.299. <«d[, Bftdftmi, Nov.-Jao.

43. *Bamphicarpa.*

B. longiflora, *Berth** P.B.I.-.IV-300.

Wada, near Mahableshwar. Malwan. NOT.

44. *Centranthera.*

C. hispida, *Br.*. P.B J.—IV-301.

Wada, near Mahableshwar. Malwan. Oct.-Ndv.

46. *Sopubia.*

S. delphinifolia, *&. Don.*, F.B.I.—IV-302. *Vvdhali. KultM.* Guzerat Deccan< *AvgML*

8. trifida, *Bam* **.B.I.—IV-302.

Panchgani. Oct

CIV.—0BOBAN0HACE.E.

1. *Æginetia.*

M. indica, *Bosh.*, F.B.I.—IV-320.

Sewree, near Bombay. Oct.

2. *Chrittisonia.*

C. Lawii, *Wight,* P.B.I.—IV-322.

Purandhnr. July.

3. *Cistanche.*

C. tubulosa, JFt^., F.B.I.-~IV-324.

KaraohL Dec.

4. *Orobanche.*

0. indica, *Ham,* F.B.I.—IV-326.

Diksai, Deccan. Oct.

CV.—LENTIBULARIEÆ.

U. J fig, Z. /„ P.B.I.^IV-328. *Utricularia.*

U. flexuosa, FaM., P.B.I.—IV-329. Malwan. Nov.

U. exoleta, *Br.*, F.B.I.—IV-329. Poona.

V. albo-ooerulea, *Dalz.*, F.B.I.-IV.33O. Samasgi, N. Kanara. Feb.

U. ocernlea, *Linn.*, F.B.I.—IV-331. Mahableshwar. Sept.

17. reticulata, *Smith,* F.B.I.—IV-331. Mahableshwar.

U. orbiculata, TFaW., F.B.I.—IV-334. Mahad. S, Konkan. Oct.

Ehandalla. Lanauli. Sept.

CVI.—GESNERACEÆ.

1. *Æschynanthus.*

M. Perottetii, *A. D. C,* F.B.I.-IV-339.

Mahableshwar. Oct.

7. *Platystemma.*

P. violoidea, *Wall.*, J.B.I.~IV-361.

Champaneer, Guzerat. In fruit, Dec,

15. *Klugia.*

K. Notoniana, *A. D.* C, r.B.i.,^-IV.366.

Malkapur. W. Ghats. Oct.

16f *Rhynchoglossum.*

R. obhqaum, »* J.B.I.,—IV-367.

Dasgaon. Wadi. Oct.

ÇVII,—BIGNONIACEÆ.

2. *MilUngtonia,*

M. hortenais, Z. /., F.B.I.-IV-377. *Cowla nim.*

Planted widely. Oct.-Nor.

3. *Oroxylum.*

0. indicum, ^e^., P.B.I—IV-378. *Tetu, Jagadala.*

Peint Taluk. W. Ghats. Jijay-July.

Tecoma.

T. Stan* *Juss., D.* C, Prod.-IX.224. *'

T.undula$_{te}$,a.Z>$_{0}$,.,F.$_{B.}$^iy.378. *Rakta rohida. Lohero.* W. Khandeish. Bunasa River. Gajerat.

Planted widely

Dalsel/. Mar.-Apl.

6. *Dolichandrone.*

D. falcata, ^$_{W}$., P.B.I^IV-380. *Morshing, Mersking.*

D. Lawii, *Seem.*, F.B.I.^IV-380. *Medashingi.*

Poona. May.

Konkan. N.Kanara. Mar.-May.

6. *Heterophragma.*

H. Roxburgh* DC, F.B.I^IV-381. *Warus, Varasa.*

Poona. W.Ghatfl. Dec.

S. chelonoideB, *DO.*, F.B.I.—IV-382. *Pddal. O ins ing mar a.* Kbandalla. Bankot. ApL-May.
S. euaveolens, *DC,* F.B.I.—IV-382. *Parul, Patala, Kalgari.* Poona. Planted, Apl.
S. xylocarpum, *Wight,* F.B.I.—IV-383. *Kadashinga, Kursing.* Peint. Apl.

9. *Pajanelia.*

P. Rheedii, *DC9* F.B.I.—IV-384. Yellapur Taluka. *Talbot.* Cold Season. *Parmentiera* (Tropical America).
P. oerifera, *Candle-tree of Panama.* W. i. Club Garden. Poona.

CVIII.— PBDALISBiE.

1. *Pedalium.*

P. murex, *Linn.*, F.B.I.—IV-386. *Malvi gofcharu.* Badami. Shrivardhan. Oct.

2. *Sesamum.*

8. indioum, *DC,* F.B.I.—IV-387. ffe^. Cult. Aug.-Sept.
S. laciniatum, *Klein,* P.B.I.—IV-387. Badami. Oct.

CIX.—ACANTHACB*.

1. *Thunbergia.*

T. fragrane, *Boxb.*, P.B.I.—IV-390. *Chimine.* Panchgani. Oofc.
T. alata, *Bojer,* F.B.I.—IV-391. Cult.
T. Hawtayneana, *Wall.*, F.B.I.—IV-391. Dharwar.
T. grandiflora, *Roxb.*, F.B.I.—IV-392. Colt. Gardens.
T. mysorensis, *T. Anders.*, F.B.I.—IV-393. Planted Mahabl. Poona. Near Qairsoppa. *lalbot* Nov.-Jan.

2. *Ely traria.*

E. orenata, *VahL,* F.B.I.—IV-394. *Da smori.* Ahmedabad. Oct.

3. *flelsonia.*

N. oampestris, *Br.9* F.B.I.—IV-394. 23 miles east of Rutnagiri. Jan.

4 *JSbermaiera.*

E. glanca, *Nees.*, F.B.I.—IV-395. S. Konkan, *BaUell.*
E. zeylanica, *Neet.*> F.B.I.—IV-397. Waree Jungles, *Daleeli.*

6. *Cardanthera.*

C. balsamica, .Btfnft., F.B.I.—IV-404. Siddapur, J. P. rownflf. Mar.
C pinnatifida, J?e»^,, F.B I.—IV-405. Divimana, N. Kanara. Feb.

7. *Hygrophila.*

H. polysperma, T. *Anders.*, F.B.I.—IV-406. Verawal. Rajkot.
H. Berphyllum, *T. Anders.*, F.B.I.—IV-406. , W. Ghats, widely. Sept.-Jan.
H. spinosa, *T. Anders.*, F.B.I.—IV-408. *Kolista Kolasunda Talimhhana, Ekara.* Deocan, widely. June-Jan.

9. *Calophanes.*

C Nagchana, *Nees.*, F.B.I.-IV-410. Dan S - Nasik _ Apr _
C Dalzellii, *T. Anders.*, F.B.I.-IV-411. Dan ^ Poona, **May.**

10. *Suellia.*

B. patula, «7-a$_{C2}$., F.B.I.-IV-412. *Katmora.* Deocan* **June-Nov.**
R. longifoUa, *T. Anders.*, F.B.I.-IV-412. sind, *Stocks.*

12. *Petalidium.*

P. barlerioides, JV^., F.B.I.-IV^16. Bansdft _ Dan 6 ' Feb-April,

13. *Phaylopsis.*

P. parviflora, TFiW., F.B.I—IV-417[1]. ^^t'wflcAori Bftdami _ Jftn,

14. *Dadalacanthus.*

D. nervosne, *T. Anders.*, F.B.I.-IV.-419. 12 mileB west of Poona. Deo.
D. roseus, *T. Anders.*, F.B.I.-IV-419. JD^awt*/i. Konkan _ N ^ J » n *
D. purpwascens, T. *Anders.*, F.B.I.-IV-420. . Konkan _ **Nov.-Jan.**
D. montanuB, *T. Anders,*. F.B.I.-1V-421. . « * near Dharwar, *Dalzell.*

15. *Hemigraphis.*

H. dura, *T, Anders.*, F.B.I.—IY-422. *Gantelbu.* Surat. Gadak. Jan.
H. latebrosa, *Nees.*, F. B.I.—IY-422. Rewadanda. Marmagoa. Dec
H. elegans, *Nees.*, F.B.I.—IV-424. Nasik. Jan.

18. *Strobilanthes.*

S. barbatus, *Nees.*, F.B.I.—IY-437. Castle Rook. Matheran. Oct.-Nov.
S. warreensis, *Dalz.*, F.B.I.—IV-439. Nilkund Ghat. Feb.
S. ciliatus, *Nees.*, F.B.I.—IV-439. Sawantwadi. Nov.
S. lupulinuB, *Nees.*, F.B.I.—IV-443. Ram Ghat. Belgaum. *Ritchie.*
S. Heyneanus, *Nees.*, F.B.I.—IY-443. Castle Rook. Matheran. Oct-Nov.
S. ixiocephalus, *Benth.*, F.B.I.—IV-444. *Waiii.* Vingorla. M'war. Deo. Jan.
S. scrobioulatus, *Dais.*, F.B.I.—1V-445. Mahableshwar. Nov.
S. calloBus, *Nees.*, F.B.I.—IV-451. *Karwi, Kara, Karowa.* Mahableshwar. Oct.
8. reticalatus, *Staph., Kew Bull.*, 1894, fol. 347. Mahableshwar. Oct.
S. asper, *Wgt.*, F.B.I.—IY-452. Santaveri. *Dee,*
S. sessilis, *Nees., var.* Sessiloide* *Wt.*, F.B.X.—IV-462. Ambooli. Jan,
S. perfoliatus, *T. Anders.*, F.B.I.—IV-458. Matheran, Kadgal, N. Kanara. Jau.-Feb.

19. *Calacanthus.*

C. Dalzelliana, *2. Anders.,***B.I.*—IV-478. Matheran. Lonauli. Oot.-Jan.

20. *Blepharis.*

B. asperrima, *Nees.*, F.B.I.—IV-478. *Akada.* M'war. Rewadanda. Oct.
B. boerhaavifolia, *Pers.*, F.B.I.—IV-478. Surat. Ahmd. Rajkot. Oct.-Dec
B. molluginifolia, *Pers.*, F.B.I.—IV-479. *Kanti Maka.* Badami. Karnalee. Guzerat. Sept.-Oct.
B. Bindica, *Stocks.*, F.B.I.—IV-479. *Jasad.* Bulokhan, Sind. Aug.

21. *Acanthus.*

A. ilioifolius, *Linn.*, F.B.I.—IV-481. *Marandi.* Thana Creek. Karwar. Apl.-May.

22. *Barleria.*

B. Prionitis, *Linn.*, F.B.I.—IV-482. *Pivala Koranti. Kalsunda.* Matheran. Decoan, widely. Nov*
B. Hochstetteri, *Nees.*, F.B.I.—IV-483, Sind.
B. acanthoides, *Vahl.*, F.B.I.—1Y-484. Sind. Oct.
B. tomentosa, *Both.*, F.B.I.—IV-485. Badami. Nov.
B. involucrata, *Nees.*, F.B.I.—IV-485. Ambooli Ghat. Oot.
B. Lawii; *T. Anders.*, I.B.I»— IY-486. Shinvaghad. Oct.
B. sepalosa, *Clarke,* F.B.I.—IV-417. Konkan. *Gibson.*
B. montana, *Nees.*, F.B.I.—IV-487. W. GbatB. Oct.
B. Gibsoni, *Dalz.*, F.B.I.—IV-487.
B. grandiaora, *Dalz.*, F.B.I.—IV-488. W. Ghats. Oct.
B. cristata, *Linn.*, F.B.I.—IV-488. *Gokran.* W. Ghats and Decoan Hills. *Dec.*
B. oouTtallica, *Nees.*, F.B.I.—IY-489. Arbail Ghats, N. Kanara. Feb
B. Stocksii, *T. Anders.*, F.B.I.—IY-489. Bababudan Hills. *Stocks.*
B. strigosa, *Willd.*, F.B.I.—IV-489.
var. terminals, F.B.I.—IV. *Kala Koranta, Wahii.* Vingorla. Marmagoa* *Dec*
B. lupulina, *Ldl. D C,* Prod. X1-237. Gardens.

23. *New'acanthus**

N. trinerviua, *Wt.*, F.B.I.—IV-491. Khandalla. Dec-Jan-
N. spserostachys, 2>a/*., F.B.I.—IV-491. Khandalla. Pen. Sept.-Oct.

24. *Crossandra**

C. undulifolia, *Satisb.*, F.B.I.—IY-492. *Aboli.* Kumpta. June-Jan.

25. *Asystasia.*

A. coiomandeliana, *Nees.*, F.B.I.—IY-493. yp. Ghats. Nov.-Deo.
A. violaoea, .Date., F.B.I.—IV-493. Matheran. Bassein. Nov.
A. Lawiana, *Dalz.*, F.B.I.—IV-496. Belgaum. Poona. Aug.-Oct.

26. *Eranthemum.*

E. malabaricum, *Clarke,* ».».!.'—1V-497. Marmagoa. Dec.
E. bicolor. Gardens.

28. *Andrographis.*

A, panioulaia,^^., F.B.i.—I\r-50l. *Oleikaryet.* Honawar. *Dec.*
A. Neesiana, *Wgt.,* F.B.I.—IV-304.
A. echioides, *Nees.,* F.B.I.—IV-505. *GUZ.* Kamala. Badami. Sept-Nov.

29. *Haplanthus.*

H. verticillaris, *Nee$.*$_s$ F.B.I.—IV-506. *Kateri-* Mahableshwar. Sinvaghad. Dec.
H. temaculatus, *flees.,* F.B.I.—IV-607- Surat. Maimagoa. Dec.

30. *Gymnostachyum.*

G. glabrum, *T. Anders,* F.B.I.—IV-509. Castle Rook. Jan.
G. canescens, *T. Anders.,* F.B.I.—IV-509. Kanara Ghats, *Law.*
G. latifolium, *T. Anders.,* F.B.I.—IV-509. Castle Rock. Dec.

31. *P7dogacanthus.*

P. curviflorus, *Nees.,* F.B.I.—IV-511. Cult. Gardens.

34. *Lepidagathis.*

L. oristata, *Willd.,* F.B.I.—IV-516. *Bui Gend.* Deccan. Oct.-Mar.
Ifc mitis, *Dalz.,* F.B.I.—IV-516. Belgaum, *Dalzell.*
IJ« trinervius, *Nees.,* F.B.I.—IV-517. Pahlanpur. Periin. Kathiawad. Nov.-Feb.
1. lntea, *Ealz.,* F.B.I.—IV-517. Jaighur. Dec.
L. clavata, *Dalz.,* F.B.I.—IV-518.
!*• prostrata, *Dalz.,* F.B.I.—IV-518. Marmagoa. Dec
!*• rigida, X)a?s., F.B.I.—IV-518. Scind, *T. Anderson.*
I*- cuspidata, iVees., F.B.I.—IV-519. *Akhara.* W. Ghats. Dec-Mar.
I" calycina, *Hochst.,* F.B.I.—IV-519. ^{sind}* *Stocks.*
L. scariosa, iVee*, F.B.I.—IV-520.
!«• hjalina, *Nees.,* F.B.I.—IV-521, ^' Kaoara. May.
Ii- fasciculata, iV^., F.B.I.—IV-522-

3^{Q} *Justicia.*

J- montana, TFaJJ., F.B.I.—IV-525. Yacombi, N. Kanara. Feb.
J. Betonica, Zi»»., F.B.I.—IV-525.
var. ramosissima. SangameshwaT. Dec.
^{J}- trinervia, *Vahl.,* F.B.I.—IV-525. Mahableahwar.
^{J}- glauoa, *Both.,* F.B.I.—IV-529. Badami. Aug.-Oct.
$^{Jt\ h}$eterocarpa, *T. Anders.,* F.B.I.—IV-531. Porebunder. Nov.
^{J}- Gendarnssa, *Linn.,* F.B.I.—1V-532. *Tew.* Cult. Nov.-Jan.
^{J}- wynadensis, *Wall.,* F.B.I.—IV-533. Marmagoa. Dec.
J. miorantha, *Wall.,* F.B.I.— IV-536. Vingorla, *Dateell.* Aug.
^{J}- qninqueangulavis, *Koen.,* F.B.I.—IV-536. Badami.
^{J}- Quinqueangularis, *var.* peploides. Poona. Oot.-Apr.
^{J}- diflfusa, *Willd.,* F.B.I.—IV-538. ^{Poona}- Oct.-Dec
^{J}- simplex, *Don.,* F.B.I.—IV-539. Pahlanpur. Bajkote. Dec
J. simplex, *var.* serpyllifolia, *Benth.* Badami, N. Kanara, Nov.-Dec
J- procumbens, *Linn. Karambal Kahnashi.* Deccan. Oct.-Mar.

39. *Adhatoda.*

A. Vasica, *Nees.,* F.B.I.—IV-540. *Adulsa, Karav.* Guzerat to N. Kanara. Aug.

40. *Bhinacanthus.*

I*, coromunis, *Nees.,* F.B.I—IV-541. *Gajakarni.* $^{M>war}$- Gardens. Oct.-Jan,

Dianthera. (West Indies).

D. secnnda *{Rhytiglossa), DC,* Prod.-XI-34O. *Bot. Mag.,* 2060. Gardens. Oct-Xov.

Jacobinia (Central America).

** (Drejera) bolivienaie, *DC,* Prod.—XI-33i. Gardens.

44. *Ecbolium.*

^{E}- Linneanum, *Kurz.,* F.B.I.-1V-544. 5a$_{W}$a&o«. *DahktwaduUa.* Matheran. Nov.-Dec.

E-Iinneanum, Edentata. ^ ^ ep$_{t}$

45. *Graptophyllum-*

G. hortense, *Nees.,* F.B.I.—IV-544. Gardens

46. *Bungia.*

E. crenata, *T. Anders.*, F.B.I.—IV-547. Kanara. *Law.* Konkan, *Stochs.* Belgaum, *Ritchie.*
E. linifolia, *Nees.*, F.B.I.—IV-548. Banks of Kala Nadi.
R. repens, *Nees.*, F.B.I.—IV-549. Dandali, N. Kanara. J»[D]-
R. elegans, *Dalz.*, F.B.I.—IV-549. Dharwar. Poona. Sept.
R. parviflora, *Nees.*, F.B.I.—IV-550. *Ralinach*, Turmura.* W. Ghats. Jan.-Feb.
R. parviflora, *var.* pectinata. *Turbura.* Panvel. Marmagoa. Dec.-Feb.

47. *Bicliptera.*

D. zeylanica, *Nees.*, F.B.I.—IV-552. W. Ghats. Pec-Jan-
D. cuneata, *Nees.*, F.B.I.—IV-552. Mawal. JarondaHilL ^*n.*
D. micranthes, *Nees.*, F.B.I.—IV-553. *Amaphutavani.* Sahkpur, Sind, Oct.

48. *Perittrophe.*

P. bicalyculata, *Nees.*, F.B.I.—IV-554. Poona. Smat. Sind. Nov.

49. *Eypoestes.*

H. lanata, *Dalx.*, F.B.I.—IV-557. Konkan*

CXI.—VEBBENA0E2E.

2. *Lantana.*

L. indica, *Roxh.*, F.B.I.—IV-562. Jamnagar. Jooner. Sept.-Jan»
It. Camara, *Linn.*, F.B.I.—IV-562. *Tantanl* Spread widely. All the year,

3. *Lippia.*

L. nodiflora, *Rich.*, F.B.I.—IV-563. *Boolean.* (Sind) Deccan. Guzerat. Sind. All the Year.

4. *Bouchea.*

B. marrubifolia, *Schauer*, T.B.I.—IV-564* Sind.

5. *Stachytzrpheta.*

S. indica, Fa^^., F.B.I.—IV-564. Weed in Gardens. Ang.-Nov.
S_f mutabilis, Fa^., DC, Prod.—XI-565. Gardens. Aug.-Nov.

6, *Priva.*

P. leptostachya, *Jus8.*, F.B.I.—IV-665. Bijapur. Sind. Dec-Jan,

7. *Verbena.*

V. venosa, *Gill.*, *DC.*, Prod.—XI-541. Planted. Sinvaghad.
V. offioinalis, *Linn.*, F.B.I.—IV-565, A weed in gardens. Sept.

Citharexylum.

C. Bubserratum, *8wurtz.*$_f$ *JDC*, Prod.—XI-614. Gardens. Nov.-Peo.

Duranta.

D. Plumieri, *Jacq.*, *DC*, Prod.—XI-615. Planted. June-Dec

9. *Callicarpa.*

C. lanata, *Linn.*, F.B,I.—IV-567. *Aisur.* Khandalla. Castle Rock. Nov.-Feb.

10. *Tectona.*

T. grandis, Z/., F.B.I.—IV-578. ^a^a *Sagavan.* Deccan Hills and Konkfin. Aug.

11. *Premna.*

P. scandens, J?oac6., P.B.I.—IV-573. *Guradwel.* Matheran. Oct.
P. coriacea, *Clarke*, F.B.I.—IV-573. Khandalla.
P. integrifolia, £»»»., F.B.I.—IV-674.
P. latifolia, *Roxb.*, F.B.I,—IV-577.

12. *Gmelina.*

G. aiborea, X*»»., F.B,I.—IV-587. *Sievan Bothee.* Dang. Mawal. Feb.-Mftr.
G. asiatica, *Linn.*, F.B.I.—IV-582, £afo» *Skivan** poona.
G. HyBtrix, JT«^., ?,B.i. -IV-582. Gardens?

13. *Vitex.*

V. Negundo, *Linn.*, F.B.I—IV-583. *Nirguri, Nagoda.* — W. Ghats. Konkan. Jan.
V. altissima, *Linn.*, F.B.I.—IV-584. *Banalgay.* — Yacumbi, N. Eanara. July-Feb.
V. alata, *Heyne*, F.B.I.—IV-584. — Limbagaon. Satara. May.
V. leucoxjlon, *Linn.*, F.B.I.—IV-587. — Atgaon, Tbana. Limbagaon. Mar.

14. *Clerodendron.*

C. inerme, *Garten.*, F.B.I,— IV-589. *Eoiwale, Wanjai, Nurwale.* — Konkan. Gnzerat. Nov.-Jan.
C. phlomoides, *Linn.*, F.B.I.—IV-690. *Airan, Takle.* — Surat. Broaob. Thana. Aug.-Feb.
C. calamitosam, *Linn.*, F.B.I.—1V-591. — Gardens. Bombay. Sep.-Oct.
C nutans, *Wall.*, F.B I.—IV-591. — Gardens. Aug.-Sept.
C serratum, *3pr.*, F.B.I.—IV-692. *BUrangi.* — W. Gbats, Purandhur. Ang.
C infortunatum, *Gaertn.*, F.B.I.—IV-594. *Kuri, Bhandira.* — W. Ghats. Aug.-Sept.
C. Buchanani, *Boxb.*, F.B.I.—IV-596. — Gardens. June-Dec.
C. Siphonanthus, *Br.*, F.B.I.—IV-595. — Gardens. Sept. Oct.
C. aculeatum, *Linn.*, D C , Prod.—XI-656. — Gardens. Oct.
C. emirense, *Bojer., DC,* Prod.-XI-661. — Gardens. Sept-Oct.
C. fraprans, *Vent, DC.*$_5$ Prod.—XI-666. — Gardens. Sept.-Nov.
C. Thompsons, *Bot Mag.*, 5313. — Gardens. Sept.-Deo.

15. *Holmtkioldia.*

H. sanguinea, *Betz.*, F.B.I.—IV-59& — Gardens. Sept.

20. *Symplorema.*

fi. involucratum, *Boxh.*$_t$ F.B.i.-IV-5y9. — Washind. Thana, Mar.
S. polyandtum, *Wight*, F.B.I.—IV-599, — Belgaum.

22. *Congea.*

C. tomentosa, *var.* azurea, *Boxb.*, F.B.I.—IV-604. — Gardens.

23. *Avicennia.*

A. offioinalis, *Linn.*, F.B.I.—IV-604. *Tivar.* — Bombay, Seashore. May-June.

CXIL—LABIATES.

1. *Ocimum>*

O. canum, *Sims.*, F.B.I.—IV-607. *Rantulasa.* — Deooan, widely. July-Nov.
O. Baeilicum, Zťww., F.B.I.—IV-608. *Sabja Kama-Rasturi.* — Cultivated.
0- gratiasimum, *Linn.*, F.B.I.—IV-608. *Malitula*, Bamtulas.*
O. adscendens, *Willd.*, F.B.L—IV-608. — Common, *Dalzell.*
O. sanotum, *Linn.*, F.B.I.—IV-608. — Cultivated.

2. *Geniosporum.*

<J. prostratum, *Benth.*, F.B.I.—IV-610. — S. Konkan, *Nimmo.*

& *Platystoma.*

P. flaccidum, *Benth.*, F.B.I.—IV-61J* — Konkan on the Kala Nadi, *DaUelL*

5. *Acrocephalus.*

A. capitatus, JJeftM., I.B.I.-IV-611. — Poladpur, Vingorla. Oct.

6. *Moschosma.*

M- Polystaohyom, 5e»^., F.B.I.—IV-612. — Nadiad« Ahmedabad. Nov.

7. *Orthosiphon,*

0. pallidus, *Boyle*, F.B.I.—IV-613. — Deocan, widely.

O. tomentosxim, *Benth.*, F.B.I.—IV-613.
0. toxnentosum, *var.* glabratum. — Narel, Pali. July.

8. *Plectranthus.*

P. Stocksii, *Hooh.f.*, F.B.I.—IV-618. — Konkan, *Stocks.*
P. Wightii, *Benth.*, F.B.I.—IV-619. — Mahableshwar. Londa. Oct.
P. menthoidei, *Benth.*, P.B.L—IV-620. — Panchgani, Singhur. Dec.

P. incanus, *Link* , F.B.I.—IV-621. *Lal-agadha.* — Poona. Khandalla. Sept.
P. subincisus, *Benth.*, F.B.I.—IV-621. — Poona. Sept.-

9. *Coleus.*

C. spicatiw, *Benth.*, F.B.I.—IV-624. — Gokak Coast, North of Bassein. Feb.
C. barbatns, *Benth.*, F.B.I.—IV-625. *Mâin-mool, Garmal.* — Maval. Guzerat. Sept.
C. aromaticus, *Benth.*, F.B.I.—IV-625. *Pathtirchhr, Owa.* — Cult. Gardens.
Cv Blumei, *Benth** *Garden Coleus.* — Gardens. Deo.-Feb.

10. *Anisochilus**

A. carnosus, *Wall.*, F.B.I.—IV-627. *Kapurli, Pan-jiray.* — Mawal. Sept.
A. eriooephalus, *Benth.*, F.B,I.—IV-627. — Konkan Ghats, Sward, *Dalzell.*
A. adenanthus, *Dale. $c Gibs.*, F.B.I.—IV-630. — Pancbgani. Octr

1O.« *Hyptis.*

H. sauveolens, *Poit.*, F.B.I.—IV-630. — Marmagoa.

11. *Lavandula,*

L. Gibsoni, *Grah.*, F.B.I.—IV-631. *Niwal.* — Sinvagad. Jan.-May.
L. Burmanni, *Benth.*, F.B.I.—IV-631. *Gorea** — Deocan, widely-

12. *Pogostemon.*

P. paniculatus, *Benth.*, F.B.I.—IV-C31. — Halyal. N. Kanara. Dec
P. plectrantboides, *Desf,*, F.BJ.—IV-632. — Poona. Jan.-Feb.
P. purpurascens, *Dalz.*, F.B.I.—IV-632. *Pangala.* — W. Ghats.
P. parviflorus, *Benth.*, F.BJ.—IV-632. *Pangala.* — Sulgeri, N. Kanara. Dec-Jan-
P. Patcbouli, *Pell.*, F.B,I.—IV-633. *Pach.* — Gardens.

13. *Dysophylla.*

D. myosuroides, *Benth.*, F.B.I.—IV-638. — MabaWeshwar. Jan.
D. ealicifolia, *Dalz.*, F.B.I.—IV-638. — Mahableshwar Hills, *Gibson.*
D. Auricularia, *Bl.*, F.B.I.—IV-638. — Belgaum, *Bitchie.*
D. quadrifolia, *Bent7i.*, F.B.I.—IV-639. — Malwan, *Balll*
D. stellata, *Benth.*, F.B.I.—IV-640. — Belgaum, *Law.*
D. tomentosa, *Dalz.*, F.B.I.—IV-641. — Malwan, *Dalzell.*
D. gvaoilis, *Dalz.*, F.B.I.—IV-641. — Phonda Ghat, *Ritchie.*
D. erecta, *Dalz.*, F.B.I.—IV-641. — Malwan. *Daltell.*
D. Stocksii, *Hook.f.*, F.B.I.—IV-641. — Konkan, *Stocks.*

14. *Colebrookia.*

C. oppositifolia, *Sm.*, F.B.I.—IV-642. *Bahmini,* — W. Ghats, widely. Jan.-May.

18. *Mentha.*

M. viridis, *L., DC,* Prod.—XII-168. *Spearmint.* — Gardens.
M. piperita, i., *DC,* Prod.—XII-169. *Peppermint.* — Gardens.
M. arvensis, *Linn.*, F.B.I.—IV-648. *Pudina** —

20. *Origanum.*

O. valgare, *Linn.*, F.B.I.—IV-648. *Murtca, Marjoram.* — Cultivated.

21. *Thymut..*

T. Seipyllum, *Linn.*, F.B.I.—IV-648. *Thyme.* — Gardens.

23. *Micromeria.*

M. capitellata, *BentK.*, F.B I.—IV-649. — Mahableshwar. Hay-

27. *Meriandra.*

M. bengalensis, *Benth.*, F.B.I.—IV-653. *Kafurlcapatta.* — Garden***

28. *Salvia.*

S. lanata, *Boxb.*, F.B.I.—1V-654. — Gardens
S. plebeia, *Br.*, F.B.I.—IV-655. *Thorla Aginthamba. Kinro.* — Sept.-Feb.
S. segyptiaca, *Linn.*, F.B.I.—IV-666. *Tuhm.* — Malanga-
S. regyptiaca, *var.* pnmila, *Tufchm Malanga,* Jooneer. Karachi, — Kajkot Nov.-Dec-

Gardens*

S. ooocinea, *Linn.*, DC., Prod.—XI 1*343.
S. involuctata, *Cav.*, *DC*, Prod.—XII-333. Gardens.
S. farinaoea, *Benth.*, D C , Prod.—XII-302.

29. *Nepeta.*

Konkan.

N. rnderalis, *Ham.*, V,B.I.—IV-661. Sinvagad. Aug.-Sept.
N. bombaiensis, *Dale.*, r.B.i,—1V-667.

32. *Soutellaria.*

Castle Bock. Oct.

S. discolor, *Coleb.*, F.B.I.—IV-664.

36. *Anisomeles.*

Badami. Deccan. Konkan. Jan.

A, Heyneana, *Benth.*, F.B.I.-IV-672. *Sambarboradu.* Sinvagad. Aug.
A. ovate, *Br.*, F.B.I.—IV-672. *Gopali.* Katriz Ghat. OcU-Nov.
A. malabarica, *Br.*, F.B.I,-IV-673. *Mugbir.*

41. *Zeonurus.*

Santaveri. Bombay. Sept.

L. sibiuioiu, *Linn.*, F.B.I.—IV-678.

45. *Leucas.*

Ahoiedabad. Deccan, widely. Nov.

L. urfwnfolia, J?r.,l.B.i.-IV-68O. *Koomba.* Purandhur. Bhor. Dec.«May.
L. montana, Spr., F.B.I.—IV-682. Sinvaghad. Juggal Petit. N. Kanara Nov.
L. mollisima, *Wall*, F.B.I.—IV-682. Kanara, *Ritchie.*
L. prooumbens, *Desf.*, F.B.I.—IV-683. Guzerat. Deccan, widely. Nov.
L. biflora, *Br.*, F.B.I.—IV-683. *B<da.<* Deocan, widely. July-Jan.
L. longifolia, *Benth%* ».B.I.—1V-684. *Shetmd.* Dudani Goma. Mahableshwar, Jan.
L. stelligera, *Wall*, F.B.L-IV-686. *Burumbi.* Badami. Aug.
L. vestita, *Benth.*, F.B.I — IV-686. Mahableshwar. Jan.-Mar.
L. ciliata, *Benth.*, F.B.I.—IV-687. Kailimati, Dharwar. Aug.
L. Btriota, *Benth.*, F.B.I.—IV-688. Karlimati. Aug.
L. nutans, *Spr.*, F.B.I.—IV-688. Karli, Poona. Oct.-Feb.
L. marfinicensis, *Br.*, F.B.I.—IV-68?. Chandod. Guzerat Nov.
L. Cepbalotes, *Spr.*, F.B.I.—IV-689. Tumba. Badami. Oct.
L. diffusa>JBena.,F.B.i.IV689. Bora Deocan. Oct.
L aspera,^r.>F.B.i.-IV.96O. *Thurdaribaji, Tamba.*

46. *Leonotis.*

Deccati, Konkan, widely. Sept-Oot.

1. nepetafolia, £r., F.B.I.-IV-69L Dipmal, Matisul.

CXIII.—PLANTAGINE.

I. Plantago.

Poona. Sept-Feb.

P. major *Linn.*, F.B.I.-705. *Mrtang.* jr. *E.M. James.* Mar.
P. Stock;n,^,,F.B.i.-IV-706. Khirtar MountamB. Roogta Hills, Sind, *Vicary.*
P. amplezicaulis, *Cav.*, F.B.I.-IV-706. Gajpipah. Sind, *Stocks.*
P. ovata, .Fe^fc, F.B.I.-IV-7O7. 1^*^- Khirtar Mts., *J. E. M. James.* March,
P. ciliata, *Desf.*, F.B.I.—IV-707.

CXXVIIL—NYCTAGINEE.

2. *Boerhaavia,*

Deccan, Guzerat, Sind. Nov.

B repens,Zi*».,F.B.i.-IV.7O9. Fw* «JJJ»«• Decoan. Oot.-Nov.
B. Tepanda, *Willd.*, F.B.I.—IV-709. Deocan. Konkan. Kathywar. Ang.-Dec.
B. verticillata, *Poir.*, F.B.I.—IV-710. Satura. Jooneer Fort, *DaUelL Stocks.*
B. frutioosa, *Dale.*, F.B.I.—IV-710. Sind, *Stocks.*
B. elegans, *Choi*., F.B.I,-1V-710.

3. *jpisonia.*

Gardens.

P. alba, ^, F.B.I.-IV-7H. Ctoai *Sat*.

Mirabilis.

Gardens. Ang.-Dec.

M. Jalapa, fc DC, Proa.-XIII.426. Gulbas, Gulábash.

CXXIX.—ILLECEBRACEE.

2. *Cometes.*

Sind. Jan.

C. Burattensis, 5^».> F.B.I,-IV.712.

CXXX.—AMARANTACEÆ.

2. *Celosia.*

C. avgentea, *Linn.*, P.B.I.—IV-714. *Kurdu.* — Very widely. Oct.-Dec.
C. oristata, *Linn.*, P.B.I.—IV-715. *Cockscomb.* — Cult. and as an escape. Oot.-Dec.
C. pulohella, *Mog.*, P.B.I.—IV-715. — Santaveri, *Talbot.* Dec
C. polygonoides, *Rctz.*, P.B.I,—IV-715. — Badami. Nov.

5, *Allmania,*

A. nodiflora, .Br., P.B.I.—IV.717. — Purandbar. Badami. Nov.

6. *Digera,*

D. arvensis, *Forsk.*, P.B.I.—IV-717. *Lvlir, Kanjaro.* — Deccan. Guzerat. Siad. Oot.-Noir.

7- *Amar antus.*

A. Bpinosus, Zẇzn., P.B.I.—IV-718. Xa^ewdMa. — Widely. Sept.
A. paniculatus, iiw»., P.B.I.—IV-718. *R&jagird** — Cult.
A. candatus, iiww., F.B.I.—IV-719. Xowc /ic« *bleeding,* — Cult.
A. gangeticus, *Linn.*, P.B.I.—IV-719. *Math.* — Cult.
A. mangostanus, iiw»., P.B.I.—IV-720. *Polcala.* — Gardens Cult,
A. viridis, itṅw , P.B.I.—IV-720.
A. Blitum, *Linn.*, P.B.I.—IV-721. *Tanlulza.*
A. polygamus, *Linn.*, P.B.I.—IV-721. *Tandulza, CKauli.* — Poona, Dec-Mar.
A. tenuifolius, *Willd.*, P.B.I.—IV-722. *Tandulzt, Chowlia.*

9. *Pupalia.*

V. atropurpurea, *Mog.*, P.B.I.—IV-723. — Gardens.
P. orbiculata, *Wight,* F.B.I.—IV-724. — Sind.
P. lappaoea, *Mog.*, P.B.I.—IV-724. *Baliya, Antrihi.* — Badami. Champaner. Sept.-J»*

11. *Psilostachys,*

P. Berioea, *Mooh.f.*, P.B.I.—IV-726. — Perim. Katiawad. Jan.

12. *Nothoscerua.*

N. bractiata, *Wight,* P.B.I.—IV-726. — Sniat. Nov.

13. *JSerua.*

M. javanica, *Juss.*, P.B.I.^IV-727. *Bufawado* (Sind). — Shikarpur, Sind. Deccan. Dec
M. scandens, *Wall,* P.B.I.—IV-727. — Marmagoa. Sinvagad. Dec.
iE. lanata, *Juss.*, P.B.I.—IV-728. *Kapuri-Maduri.* — Deccan. Aug.-Sept-
M. Monsonia, *Mart,* P.B.I.—IV-728. — Badami. Oct.-Dec

15. *Achyranthes.*

A. aspera, *Linn.*, P.B.I.—1V-73O. *Ubat Khandi, Agada.* — Deccan, Sind.
A. bidentata, *Blume,* P.B.I.—IV-730. — Not yet f ound.

16. *Alternant her a.*

A. sessilis, *Br.*, P.B.I.—IV-731. *Kanchri, Jaljamba.* — Deccan. Konkan. July-Dec.

17. *Gowyhrena.*

G. globosa, *Linn.*, P.B.I.—IV-732. — Cult. Aug.-Mar.

CXVIL—CHBNOPODIACEJ:.

2. *Chenopodium.*

C. album, Z£»w., P.B.I.—V-8. *Chakravat.* — Poona. widely. Nov.
C. mnrale, iinw., P.B.I.—V-4. — Dbarwar. Poona. Aug.
C. ambrosioides, *Linn.*, P.B.I.—V-4. *Sherui.* — Poona. Aug.-Apr»

3- *Beta.*

B. Tnlgaris, *Linn.*, P.B.I.—^V-5. *Beet.* — Cult

4. *Spinacia.*

S. oleracea, ii»».., P.B.I.—IV-6. P«/alr. — Cult,

5. *Atriplex**

A. hortensis, Z'm , F.B.L-V-6. *Karake, Suraka, Oracht.* Cult.
A. Stocksii, *JBoiss.*, F,B.I*—V-7. Bind. Verawal. Jan.

11. *Kochia.*

K. scoparia, *Schrad.*, F.B.I;—V-ll. Sibi. Sept.
K. indica, *Wight,* F.B.I.—V-ll. Sibi. Sept

12. *Anthrocnemum.*

A. indicum, *Mog.*, F.B.I.—V-12. *Machur, Machola. Chil.* Karachi. Dec.
A. glaucum, *Mog.*, F.B.I.-V-12. *Machola, Chil.* Karachi. Dec.

13. *Salicornia.*

S. brachiata, *Boxb.*, F.B.I.-V-12. *MachuL* Nowsaree. Porebunder. Nov.-Doc.

14. *Suceda.*

5. fruticosa, ^b^>fc., F.B.I-V-13. *Morasa, Ushuk-lani.* Dwarka. Bhownugger. Nov.* Dec.
6. monoica ^o^A?., *.B.I.—V-13. Karachi. Dharampter. Nov.-Deo.
S. mudiflora, Jfo^., F.B.I—V-l4. il/o^a.
S. maiitima, *Dumort,* F.B.I.^-V-14. *Khari-lani, Lana.* Sind. May.

15. *Haloxylon.*

H. recurvum, Btiw^., r.B.i.—V-16. *Khari-lani.* •Sukkur. Nov.
«. sahoomicum, £w»^., PB.i.—V-16. Sibi. Oct.

13. *Salsola.*

S. fotida, *Bel.*, F.B.I.—V-18. *Zonan, Ellakura.*

18. *Halocharis.*

H. sulphurea, *Mog.*, P.B.I.^V-19. Sibi, Sind. Sept.

20. *Busella.*

B. rubra, Zfn,,., F.B.I.—V-20. *Tambadi-velbondi, Myal-ke-baji.* Gardens. Oct.-Deo,
B. var. alba. *Velbondi, Myal-ke-baji.* Gardens. Oct.-Deo.

CXVIII.—PHYTOLACCEJE.

1. *Bivina.*

fi, taTM. *Linn., DC,* Prod.-XIIM0. Gardens. Aug.-Deo.

CXIX.-POLYGON ACE^.

1. *Calligonum.*

c- polygonoides, *Zinn.*, r.B.i.—V-22. Sind. *Stocks.*

2, Pteropyrum.

P. Oliveri, *Jaub. and Spach.*-fpjB.x.—V-23. Laki, Sind. Oct.

3. *JPolygonum.*

*• plebejum, *Br.*, p B.I.—V-27. Deccan. Sind. Dec-Mar.
P. tomentosum, *Willd.*, F.B.I.—V-30. Kumpta. Samusgi. Dec-May*
Pt linabatum, *Meissn.*, F.B.I.—V-30. Konkan. *Law.*
R glabrum, TTtWrf., *.B.I.—V-34. *Dongar-rheta, Parala.* Deccan, widely. Oct.-Mar.
• lapathifolium, Z»»., F.B.I.—V-35. Konkan.
P- barbatum, *Zinn.* F.B.I__V-37. Alar. Dharwar Coll. Mar.
*• Hjdropiper, *Zinn.*, F.B.I.—V-39.
P- flaocidum, *Meissn.*, F.B.I.—V-39.%
^ alatum, *Sam.*, F.B.I.—V-41. Mahableshwar. Aug.-Oct.
R chinenae, Xtnn., F.B.I.—V-44.
P. pedunculare, *Wail.*, F.B.I.—V-48.
**• pedunoulare, *var.* angustissima. Batnagiri. Missar. Oct.

4. *Fagopyrum.*

F. esculentum, *Moench.*, F.B.I.—V-55. *Buckwheat.* Gardens. Jan.

7. *Bumex.*

R. dentatus, *Linn.*, F.B.I.—V-59. Sind. Konkan. *Lan.*
K. nepalensis, *Spr.* F.B.I.—V-60. Poona. Gardens. Sept.-Oct.
R. vesicarius, *Linn.*, F.B.I.—V-61. *Chulca.* Cult.

CXX.—PODO8TEMONACB-E.

1. *Tcrniola.*

T. pulchella, *TaU* F.B.I.—V-62. *Karak-ful.* W. Ghats. Oct.
T. Lawii, *Wedd.*, F.B.I.—V-63. W. Ghats. Oct.
T. longipes, *Tvl.*, F.B.I.—V-68. W. Ghats. -*Dal**'
T. pedunculosa., F.B.I.—Y-63. W. Ghats. :*Dal**-
T. foliosa, TFe^c?., F.B.I.— V-63. W. Ghats. J*Dal**>

2. *Podostemon.*

P. diohotomus, *Gardn.*, F.B.I.—Y-64.
P. Hookerianus, *Wedd.*, F.B.L—V-65. *Karak-ftd.* Mawal. Oct.

CXXIII.—AEISTOLOCHIACBJE.

2. *Brag ant ia.*

B. Wallicbii, *Br.*, F.B.I.—V-73. l^alkund Ghat. Nov.
B. Dalzellii, if./., F.B.I.—V-73. Konkan. *Dalzell.*

4. *Aristolochia.*

A. bracteata, 2tete., F.B.I.—V-75. *Kalipat,Kidamar, Ghandata.*
A. indica, *Linn.*, F.B.I.—75. *Sapsanda.*
A. fimbriata, CAam., D C , Prod, XV— S. I. 454. Gardens. Cult-
A. ornithocephala, *Hort.* Gardens. Cult.
A. elegans. *Bot. Mag.*, 6909. Gardens. Cult-

CXXXIX.—PIPEBACEE.

1. *Piper.*

P. trichostachyon, *Cas.*, F.B.I.—V-80. Konkan. Kanara. Khandala-
P. longum, *Linn.*, F.B.I.—V-83. JP:«^Z*. Gardens. Oct.-Nov.
P. Betle, *Linn.*, F.B.I.—85. *Nagwail, Beth-vine.*
P. nigrum, *Linn.*, F.B.I.— V-90. *Me re wail.* Gardens. Oct.
P. Hookeri, Jtfi^., F.B.I.—88.

3. *JPeperomia.*

P. Wightiana, *Miq.*, F.B.I.—V-98. Konkan on trees, *Stocks.*
P. portulacoides, *A. Dietr.*, F B.I.—V-90. Mahableshwar. Aug.
P. pellucida, *JEE. B. $ K.* Bombay, common. Oct.

CXXVL—MYBISTICEJE.

1. *Myristica.*

M. laurifolia, *H. f 6f T«* F.B.I.—V-103. *Joyaphal, Jajikai.* Chandawar. N. Kanara. Feb.
M- malabarioa, *Lamk.*, F.B.I.—V-103. *Banfaiphal, Kaiphal.* Chandawar. N. Kanara.
M. attenuate *Wall.*, F.B.I.—Y-110. *Bukt-mara.* Divimana Ghat. Feb.

CXXVIIL—LAUBIHBiE.

L *Cryptocarya.*

G. Wigbtiaua, *Thw.*9 F.B.I.—Y-120. *Gulmur.* Matheran. Apl.-May.

3. *Beilschmiedia.*

B. fagifolia, *Nees.*, F.B.I.—Y-122. Matheran. Ainshi Ghat. Dec.
B. Wightii, *Benth.*, F.B.I.—Y-124. Matheran. Sept'

7. *Cinnamomum.*

G. zeylanioum, *Breyn.*, F.B.I.,—V-131. *Dalchini, Ohez, Bojevar.* Lanauli. Londa. Nov.-Har.
C. macrocarpum, *Hook.*, F.B.I.—V-133. Supa, N. Kanara. Jan-

8. *Machilus.*

M. macrantha, iVew., F.B.I.—V-140. *Gulum.* Lanauli. Kumtha. Dec-Mar.

10. *Aheodapltne.*

A. semecavpifolia, *Nees.*, F.B.I.—144. *Phudgus.* Yacombi, N. Kanara. Deo.

11. *Actinodaphne.*

A. Hookeri, *Meissn.*, F.B.I.—V-149. *Pisha.* Mahableshwar.

11A. *Litsaa.*

L. tomentosa, *Berb.*$_{s}$ F.B.I.—V-167. *Chihna.* Castle Rock. Nov.
L. sebifera, *Pers.*$_{\%}$ F.B.I.—V-167. *Maidalakdi.* Yacombi. Feb.-May.
L. Stocksii, *Hook, f.*, F.B.I.—V-176. Mahableshwar. Oct.
!•• Wightiana, *Wall.*, F.B.I.—V-177- Ghats, W. India, *DeCrespigny.* Near G.iirsoppa, *Talbot.* Oct.-Nov.
I- zeylanica, *C. $ Fr*, F.B.I.—V-178. ^T«»z»^, OAi/-cA?Va. Mahableshwar. N. Kanara. Nov.

14. *Cassytha.*

C. filiformis, ii$_{OTM}$., F.B.I.— V-188. *Amarwela, Eotan.* Konkan. Sept.

CXXIX.—PBOTBACE^:.

Maeadamia (Eastern Australin).

M. tornifolia, *Gard. Citron.*, 1870—118 L. Planted.

Grevillea (Australia).

Q< robu8ta» ^ *Cunn., DC., Prod. Silver Oak.* Ilanted.

CXXX.—THTMELJSACEJ:.

7- *Lasiosiphon.*

L, eri°cephaius, J)$_{e}$wc, P.B.I.—V-197. *BamMa.* Mahableshwar. Tec-May.

CXXXL—EL^lAGNACEiE.

1. *JSl&agnus.*

& latifolia, *Linn.*, F.B.I.—V-202. *Ambagula.* Mahableshwar.

CXXXII.—LOEANTH*ACBM.*

1. *Loranthus.*

The names *Bliangul, Vonda, Vundo,* are generally applied in this genus and to other parasities and epiphytes.

5^{1,} ^{Wal}Hchianus, *Schultz,* F.B.I.—V-204. Karwar. Ang.
L* °l>tusatus, *Wall.*, F.B.I.—V-205. Mahableshwar. April.
!*• Scnrrula, *Linn.*, F.B.I.—V-208. Panchgani. Wada. Oot.-Feb.
**• Pulverulentns, *Wall.*, F.B.I._V-211. Konkan, *Stocks.*
1- tomentosa, *Heyne.*, F.B.I.—V-212. On *Phyllanthus emblica.* Near Gairsoppa.
Ai- Stocksii, ^oo^. /., F.B.I._V-213. Sawantwadi. NOT.
^. cnneatus, *Beyne,* F.B.I.—V-214. Mahableshwar. May.
L- lon giflo"i8,Z)cwow^., F.B.I.—V-214. Deccan. Feb.-Mar.
L" elasticus, *Dessouss.*, F.B.I.—V-216. Mahableshwar.
L. lageniferus, *Wight,* F B.I.—V-218, Lanauli. Castle Rock. June-July.
L. trigonus, *W.fy G.*$_{t}$ F.B.I.—V-219. Banda. Dang. Aug.-Nov.
**• lonicertides, Ziww.^ F.B.I.—V-221. Mahableshwar. Matheran. Mar.-Apl.
^ capitellatus, TF. ^ u4., F.B.I.—V-221.

2. *Vise urn.*

V. monoicum, *Rorb.*$_{t}$ F.B.I._V-224. Londa. Sept.
V. orientate, TTfW., F.B.I.—V-224. On *Term in alia paniculata.* Nilkand, N. Kanaia. Nov.
V- capitellatum. AS;W., F.B.I.—V-224. Yellapur. Aug.
V. ramoeissimum, *Wall.*, F B.I.—V-225. Mahableshwar. Feb.-May.
V. angulatum, *Heyne.*, F.B I.—V-225.
^- articulatum, *Burnt.*, F.B I.—V-226. Lanauli. July.

CXXXIII.—SANTALACEJE.

3. *Santalum.*

8. album, X»wn., r.B.i.—V-231. *Chundana.* Gardens widely, June,

4. *Osyris.*

0. arborea, *Wall,* P.B.I—Y-232. *Lotali Popli.* Decoan Hills, widely-

CXXXIY.—BALANOPHOEEJB.

i. *Balanophora.*

B. sp. inc. On roots of *Acacia arahica.* Poona. Oct.
» » » Camiå *Car and as.* Khandallft. Oct.
B. indíca, *Wall.* ™«a.-M«ihwar.

CXXXV—EUPHOBBIACEJE.

Pedilanthua (Tropical America).

P. tithymaloides, *Poit., DC, Prod.* XV.—5. Planted. J^J-

1. *Euphorbia.*

E. pycnostegia, Bow., F.B.I—Y-246. Hullihul. Khandalla. Nov.
£. zornioides, *Boias.,* F.B.I—Y-246. Matheran. Nov.
B. elegans, *Spr.,* J.B.I—Y-246. Badami. Aug.-Nov-
E. notoptera, *Boisa.,* F.B.I—V-246. Yingorla. Nov.
E. erythroclada, *Boiss.,* F.B.I—Y-247. Mawal. Aug.-Sept-
E. cocoinea, *Roth.,* F.B.I.—V-248. Diksal. Poona. Rajewadi. July-Dec
E. Atoto, *Forst,* F.B.I—V-248. N. Kanara. Seashore. Feb.
E. linearifolia, *Roth.,* F.B.I.—V-249. Diggi Ghat. N. Kanara. Hay-
E. hypericifolia, *Linn.** F.B.I.—V-249. Guzerat. Deccan. Sind. Ang.-Nov.
E. pilulifera, Xiww., F.B.I.—Y-250. *Nayati.* Deocan. All the year.
E. rosea, *Betz.,* F.B.I.—Y-251. Fadami. Aag-
E. thymifolia, *Burn.,* F B.I.—V-252. *Dhakati dudhl Lahana nayati.* Deccan. Sind. All the year-
E. microphylla, *Heyne.,* F.B.I.—V-252. Deccan widely-
E. Clarkeana, *Kooh. /.,* F.B.I—Y-253. Sind.
E. Tirncalli, *Linn.,* F.B.I—Y-254. *Shera.* Planted widely-
E. nerifolia, *Linn.,* F.B.I.—Y-255. *Sabur.*
E. Nivulia, *Ham.,* F.B.I.—V-255.
E. antiqnornm, *Linn.,* F.B.I—V-255.
E. trigona, *Ham.,* F.B.I.—V-256. planted-
E. fusiformis, *Ham.,* F.B.I.—V-257. Poona Hills. April-May-
E. dracunculoides, *Lamb.,* F.B.I.—Y-292. *Kandi, Sabur.*
E. Rothiana, *Spr.,* F.B.I.—V-263. *Bud hi.*
E. genioulata. *Orteg., DC, Prod.—XY-72.* Poona, a weed. Oct.-Mar.
E. pulcherrima, *Wild., DC, Prod.*—XV-71, *Poinsettia.* Gardens.
E. heterophylla, *Jacq., DC, Prod.*—XV-72. Gardens. Sept.-Mar.

Synadenium (C. Africa.)

S. Grantii, If./, B.M., 5633. Gardens. Nov.-Feb.

4. *Bridelia.*

B. retusa, *Spr.,* F B.I—V-268. *KatJci, Asun.* Khandalla. Aug.
B. montana, *WUld.%* F.B.I.—V-269. *Patharphoda.* Amba Ghat. Oot.-Dec.
B. Hamiltoniana, *Wall.,* F.B.I.—V-271. JMatheran. Aug.-Nov.

6. *Cleistanthus,*

C. malabaricus, *MuelL,* F.B.I—V-276. Konkan. Banks of the Shirawah, *Law, Stocks.*

6. *Actephila.*

A. excels*, *Mu<ll.,* F.B.I—V-282. Castle Eock. Sept.

7. *Andrachne.*

A. aspera, *Spr..* r.B.i—V-284. Lftkigin(L Ang.

10. *Phyllanthus.*

P. rcticulatns, *Poir.9* F.B.I—Y.288. *Nilumbi, Holi, Kamboi, Kalapisaroot, Batwan, Pavan, Koli-madh-ke-jhar.* Dharwar to Sind. Mar.-April-
P. Emblica, *Lmn.,* P.B.I.-*V-289. *Avali, Nelli.* w Qhatg. Mar.-Apr-
P. Lawii, *Grahm.,* F.B.I—Y-29a >, ' Cftstle j ^ ^ . Qot.

£. madraspatensis, *Linn.*, F.B.I.,—V-292. Badami. July-Aug.
P. Kheedii, *Wight*, F.B.I.—V-293. Gadak. Sind. Aug.* Jan.
**• Urinaria, *Linn.*, F.B.I.—V-293. Mather an. Kbandalla. Aug.
^ simplex, jfofc., F.B.I—V-295. Dharwar. Konkan. Oot.-Nov.
P. Niruri, *Linn.*, F.B.I.—V-298. Deccan. July.
"&• debilie, *Sam.*, F.B.I.—V-299. fiind.
*• scabrifolius. *Hoo&.f.*, F.B.I—V-299. DongarGanj, Ahmednagar. Oct.
*• distiohus, *Muell*, F.B.I—V-304. *Earparawri, Raiavala.* Gardens.
*• indious, Jfw/;$_{lf}$ F.B.I—V-305. Pattagudda. N. Kanara. May.
£• falcatus.

11. *Glochidion.*

G. lanceolarium, D_a^., F.B.I—V-308. *Bhoma.* W. Ghats. Jan.-Mar.
**- tomentosum, *Dalz.*, F.B.I—V-309.
«• Talboti, i7oo^., F.B.I—V-310. N. Kanara, *Stocks.*
G- Eeylanicum, ^. J_{-Mw}., F.B.I—V-310. Yelapur. Juggalpet. Mar.-Apr.
G. Hobenackeri, 55^., F.B.I—V-314. N, Kanara. Dec.
^ Ralphii, -ffooA./., F.B.I— V-314- Mwar., near Gairsoppa, *lalbot.* Feb.-June.
l[' ^{mala}baricum, 5_e^., F.B.I—V-319. N. Kanara Ghats.
£• ellipticum, IFt^f., F.B.I. -V-321. Ainsbi Ghats, N. Kanara. Dec.
<*- velutinum, *Wight*, F.B.I—V-322. Londa. Aug.

\% *Flueggia.*

F. microcarpa, *Bl.*, F.B.I—V-328. *Pandarphali.* May-June.
F. Leucopyrus, *Willd.*, F.B.I. ~V-328 *PandriphalL* May-June.

13. *Breynia.*

B. patens, *Benth.*, F.B.I.—V-329. Kbandalla, Yellapur. July-Aug.
B. rhamnoides, *Muell*, F.B.I—V-330. Devimana. K. Kanara. *Dec.*

14. *Sauropus.*

S- quadrangularis, *Muell.*, F.B.I—V-335. C£*M. Vingorla. Aryl Ghat. July.

15. Pittran/itja.

P- Koxburghii, *Wall.*, F.B.I—V-336. *Fwintytoa.* N. Kanara. Deocan. Planted. Mar.-Apr.

16. *Hemicyclia.*

H. sepiaria, *W. V. G.*, F.B.I—V-337. Konkan southwards.

17. *Cyclostemon.*

C. confertiflorus, *Hook. f.*, F.B.I.—V-341. Katgal. N. Kanara. *Talbot.* Dec.

20. *Bischofia.*

B_I i^{a}vanica, *Bl.*, F.B.I.^V-345. *Boke.* Supa Ghats. N. Kanara. Mar.*Apr.

21. *Aporosa.*

A. Lindleyana. *BuilL*, F.B.I.^V-349. Arbyl Ghat. *N.* Kanara.

23. *Antidesma.*

•A. GhaesembiJla, *Gaert*., y.B.i.—V-357. *Papada-Khatambdi.* Londa. Dang. July.
A- Bunius, ^pr., F.B.I—V-358. Near Gairsoppa. Apl.
A- Henasu, ^g., F.B.I.—V-364.
A- Menasu, wa^ linearifolia. Ainshi. N. Kanara. Feb.

31. *Jatropha.*

J- glandulifera, leoorS., F.B.I—V-382. *Undirbibi.* Pandarpur. Aug.-Nov.
J- nana, Z)a^., F.B.I.—V-382. Poona Hills. May-July.
^- gossypifolia, £/»»., F.B.I.—V-383. *Vilayati, Batanjok.* Naturalised widely.
J- multifida, Xe»»., F.B.I—V-383. C o ^ P t o ^. Gardens*
•• Curcas, X^».f F.B.I—V-383. J2<?^^ *Yerendi, Batanjok.* Planted.
J- podagrica, .Sbo^., DC, Prod.—XV-1093. *Swollen Jatropha.* Gardens.

33» *Aleurites.*

A. xnoluccana, *Willd.*, F.B.I—V-384. *Akrot.* Planted.

34. *Croton.*

C. retioulatus, *Heyne.*, F.B.I.—V-386. *Panduray.* AmbeGhât. Oct.
C. oblongifoliup, *Bosch.*, F.B.I.—V-386. *Ganasur.* Nasik. *I)****-
C. aromatkus, *Linn,*, F.B I.—V-388.
C. Gibsonianus, *Nim.*, F.B.I.—V-392. Near Gairsoppa. Nov.

35. *Givotia.*

G. rottleriformis, *Grif.*, F.B.I.—395. KatrizGhat. Diggi. Aug.-Sept-

37- *Codiaeum.*

C. variegatum, *Bl.*, F.B.I.—V-399. *Croton.* Cultivated. Gardens.
The garden " Crotons," infinitely variable in form and colour, are varieties of this plant.

39. *Blachia.*

B. umbellata, *Baill.*, F.B.I.—V-402. Gairsoppa. Nov.
B. denudata, *Lenth.* Karwar. Potelli- Jan.

40. Dimorphocalyx.

P. glabellus, *Thw.*, F.B.I.—V-403. Matheran. J»[n]-
D. Lawiaims, *Hook.f.*, F.B.I.—V-404. Konkan. *Lato, Stocks.*

42. *Agrostistachys.*

A. indica, *Dalz.*, F.B.I.—V-406. Tulknt Ghat, *Dalzell.*
A. longifolia, *Bentk.*, F.B.I.—V-407. N. Kanara. Feb.

44. *Chrozephora.*

C. tinctoria, *A. vuss.*, F.B.I.—V-408. *Okharada.* Decoan. Guzerat widely. Nov!
C. obliqua, -4. *Juss.*, F.B.I.—V-409. Sind, *Stocks*'
C. plicata, *A. Juss.* F.B.I.—V-409. *Suryavarti.* Poona. Baroda. Apl.

Manihot.

M. ntilitissima, *DC, Prod.* 1064. Gardens.
M. Glaziovii. ? Gardens.

45. *Claoxylon.*

C. Mercurialis, *Thw.*, F.B.I.—V-412. Barda Hills. Porebunder.

46. *Acalypha.*

A. Dalzellii, *Hook, /.*, F.B.I.—V-414. Konkan ?
A. indica, *Linn*,* F.B.I.—V-416. *Kupi, Khohalù* Deccan. Dharwar. June-July-
A. bvacbystachya, *Horn.*, F.B.I.—V-416. Panchgani. Aug.
A. fallax, *Muell.*, F.B I.— V-416. Badami. Aug.
A. ciliata, *Forsk.*, F.B.I.—V-417- Jooneer. Hallihal. N. Kanara. Sept-
A. hispida, *Burm.*, T.B.I.—V-417. *Syn. A. Sanderi.* Gardens. Sept.-Dec.
A. Wilkesiana, *DC, Prod.*—XVI-817.

47 Adenochlana**

A. indica, *Bedd.*, F.B.I.—V-418. N. Kanara. Gairsoppa. *Talbot.* "Oct.-Dec.

51. *Trewia.*

T. nudiflora, *Linn.*, F.B.I.—V-423. *Pefari.* Banda Warree, Konkan. Dec.-Feb,
T. polycarpa, *Benth.*, F.B.I.—V-424. Konkan, *Law.*

53. *Mallotue.*

M. albus, *Muell.*, F.B.I.—V-429. Castle Rock. Nov
M. stenanthns, *Muell.*, F.B.I.—V-437. N. Kanara, Yellapur. *Talbot.* Sept.
M. Lawii, *Muell.*, F.B.I.—V-438. Khandalla. N. Kanara. Jnn.-Feb-
M. philippinensis, *Muell.*, F.B.I.—V-442. *Kunicum-fali, Funkosaya, Kamala$_9$ Sendr.* Gazerat.
N. Kanara. Nov.-Feb.

55. *Cleidion.*

C. javanicum, *Bl.*, F.B.I.—V-444. AinshiGhat. Yacombi.

56. *UAacaranga.*

M. Boxburghii, *Wgt.*, F.B.I.—V-448. *Ckanda Chandada.* Matheran. N. Kanara. Jan.-Mar.

58. *Homonoia.*

ft- ripara, *Low.*, F.B.I.—V-45S. *Serani.* Dang. Kliarwar. Ambi Gt&t. Jfln.
H. retusa, *MuelL,* F.B.I.-V-456, *Machim.* Deccan river beds. April;

60. *Ricinus.*

Cult.

R. oommunis, *Linn.*, F.B.T.—V-457. *JSrendi. Caster-oil plant.*

64. *Baliospermum.*

Danti. Hareshwar. Konkau. Deo.

B. axillare, JB?., P.B.I.—V-461.

67. *Tragia.*

Matheran. Nov.

T. involucrata, Z ^ . , F.B.I.-V-165. *Kkajakolati, Kolati.*

70. *Dalechampia.*

Kathiawad. Dec.

D. indica, TT^., F.B.I,—V-467.

71. *ffippomane* (West Indies).

,, ,. 7 Victoria Garden, Bombay. May,

H. Mancbinella, *L.t DC,* Prorf.-XV.1200. *Manchineel.*

72. *Sapium.*

Gardens. June.

S. sebifernm, 2?oa?6., F.B.I.—V-47C. *Pimpalpala.* Planted;
S. indicum, *Willd.*, F.B.I.—V-471- *Hurna.* Lanauli. Dec-Peb;
S. insigne, *Benth.*, F.B.I.—V-471. £>a, *Dudla.*

73. *Eocccecar'a.*

Tidal masbes. Julj-Ang.

E. Ajrallocha, ii_w»., F.B.I.—V-472. *Geva, Surund Phungali.* Koukan, *Stocks.*
E. robusta, iZbofc. /., F,BI.—V-474.

74. *Sehastiana.*

Putnngiri. Vingorla. Oct.-Dec.

8- Cbanaaelea, *Muell.*, F.B.I.—V-475. *Bhui-erendi.*

Hura (Trop. America).

Poona. Kliandalla. I lanted/

H. crepitans, D C , Prorf.—XV-1229.

Report of the Director of the Botanical Survey of India for the year 1899-1900.

The funds placed at the disposal of the Botanical Survey for exploration in Burma, Assam, and Bengal were fully expended during the year under review. In Burma attention still continued to be given chiefly to the Kachin region, two native collectors having been at work there under the supervision of Lieutenant Lee, S. 0., who has given the same kind assistance in forwarding this work that he afforded during 1898-99, The health of the collectors has been better than during the previous year, but it was again necessary to recall the collectors just before the close of the year. In Assam a native collector was at work under the supervision of Mr. Severin in the Jaboca Naga Hills at the commencement of the year, and continued there till his health completely gave way and he had to be recalled. For a considerable part of the year a number of trained Lepcha collectors were at work in the Khasia and Jaintea hills and made very valuable collections, especially of the orchids of that region. For much help in connection with their work the Survey is indebted to Mr. Pantling, Deputy Superintendent of the Government Cinchona Plantations, Sikkim, and Mr. Rita, Assistant Commissioner of Jowai. The visit of Lieutenant Gage to the Lushai country, which was in progress at the commencement of the year under review, yielded a very fine collection from an area previously quite unexplored botanically. Mr. Gage has since been engaged in working out this collection, the results of which prove to be of much interest. These the Director proposes, with the permission of Government, to publish in the *Records* of the Survey. The Director was able to take advantage of the opportunity afforded by a visit to British Bhutan towards the close of 1899, and to make a small collection of critical plants in that region.

2. *Survey of Northern India.*—The Report of this survey for 1899-1900, prepared by Mr. Duthie, who was in charge of the Department throughout the year, is submitted in original. His duties have, as in former years, included the instruction and examination ;in Botany of the students at the Forest School, Dehra Dun, the inspection of Government Gardens, Parks and Reserves in the North-"Westera Provinces, and a short visit for study in the Calcutta Herbarium in connection with the Local Floras which are now being prepared by him, and with which very satisfactory progress has been made.

3. *Survey of the Bombay Presidency.—Mr.* WoodroV, formerly Professor of Botany and Agriculture, having carried out his intention of retiring from the service of Government, Mr. G. A. Gammie, second Assistant, Government Cinchona Plantation, Bengal, was appointed by the Government of Bombay to the vacant post on July 19th, 1899- He commenced the discharge of his duties on August 2nd, and has since that date been in charge of the Botanical Survey of the Bombay Presidency. Mr. Gammie has prepared an interesting annual report which is submitted in original. He has, in spite of great discouragement, worked hard during the year to further the objects of the Botanical Survey.

4. *Survey of Southern India.*—This Department has been under Mr. C. A. Barber, Government Botanist, Madras. He was authorised[1] by the Government

of Madras to perform his duties as an officer of the Botanical Survey from 25th April 1900. Mr. Barber has, however, submitted a report which is forwarded in original, covering the period from 17th December 1898, the date on which he assumed charge of his duties as Government Botanist, to March 31st, 1900, and thus provides an account of the work accomplished since his appointment.

5. *Publications.*—The twelfth part of the *Records of the Botanical Survey* which was in the press at the close of last year was published and distributed shortly after the commencement of the year. Mr. Duthie has **published a *List of the trees and shrubs of the Forests of Pilibhit, Northern Oudh, and GoraJchpur,*** and Mr. Woodrow since his retirement has published another portion of his synopsis of the *Flora of Western India.* The Director has compiled a *precis* of the information relating to the introduction and cultivation of *Agave Sisalana* (the sisal Hemp plant) in India.

6. *Economic and Agricultural Botany.*—The Director has been engaged in investigations regarding various fibre plants, especially the fibre-yielding species of *Agave,* and has been able to arrive at definite conclusions regarding the relationship of the various species of *Pterocarpus* to the timbers they yield. Lieutenant Gage, Curator of the Calcutta Herbarium, has been engaged in an exhaustive enquiry into the causes of sugar-cane disease in Bengal. The officer in charge of the Botanical Survey of Northern India has been instrumental in the dissemination of seeds of fodder grasses. The officer in charge of the Botanical Survey, Western India, has given great attention to the utilization of *Sisal Kemp* and *Sabai grass.* The officer in charge of the Botanical Survey, Southern India, has devoted much attention to the subjects of cane-disease in Madras, ground-nuts and date-palms.

7. *Staff.*—The Director of the Survey was absent from India on privilege leave from 13th July 1899 to 12th October 1899. The Director, Botanical Department, Northern India, held charge of his department throughout the year. The officer in charge of the Botanical Survey, Western India, assumed charge of his department on August 2nd, 1899. The Government Botanist, Madras, did not become an effective member of the staff of the Botanical Survey till after the close of the year.

DAVID PRAIN, M.B, MAJOR, I.M.S.,

Director, Botanical Survey of India*

Annual Eeport of the Director of the Botanical Department, Northen India, for the year 1899-1900.

I left head-quarters on the 11th of April and travelled *viâ* Mussoorie and Chakrata to join the Forest School camp at Konain. I accompanied the students as botanical instructor through some of the forest portions of Jaunsar and TehrirGarhwal until the end of May. On the 3rd of June I arrived at Mussoorie, and remained there till the 9th of October. After a few days' halt at Dehra, I reached Saharanpur on the the 17th of that month. On the 29th of January I left for Calcutta and stayed there till the' 8th of February. I arrived at Cawnpore on the 9th, inspected the Usar reserve at Juhi on the 10th> and the babul plantation at Abbaspur near Unao on the 11th, returning to Saharanpur on the 12th. On the 12th of March I visited the Usar reserve at Gursikran near Aligarh, and from the 18th till the end of the month I was at Dehra, assisting at the Forest School Final Examinations.

BOTANICAL TOURS.

Hazara.—My head plant-collector, Inayat Khan, was engaged during the months of June, July, August and part of September, collecting specimens on the Alpine ranges of Hazára. I am much indebted to Mr. A. V. Monro> Deputy Conservator of the Hazára Forest Division, for the assistance given by him during this tour, the results of which were highly satisfactory. This is the third occasion on which Inayat Khan has been able to explore various portions of this very interesting section of the Western Himalaya.

JPangu—An excellent opportunity was afforded through the kindness of Mr. J. Marten, of the Forest Survey Department, for sending with his party another of my plant-collectors to procure specimens from the Pangi fores region. The man selected for this work was Harsukh, who has had much experience as a plant-collector in different parts of the North-Western Frontier. He started from Saharanpur on the 20th of June, and was away until the 19th of November. He brought back a most interesting collection of plants; and the notes kindly supplied by Mr. Marten, specifying the localities and elevations where each gathering was made, added greatly to its value.

THE HERBARIUM.

The additions to the Herbarium during the past year included valuable sets of plants from the Royal Botanic Garden, Calcutta, from Mr. J. Medley Wood of the Natal Botanic Garden ; and from the Vienna Botanical Museum# Selections were also made from the collections received from Hazára and Pangi and from specimens collected last year in the neighbourhood of Mussoorie and Dehra Dun. For many of the latter I am indebted to Mr. P. W. Mackinnon, especially in the way of orchids, of which some very interesting discoveries have recently been made.

DISTRIBUTION.

A large number of herbarium specimens were distributed during the year. Sets of flowering plants>nd mosses * were sent to:—the Royal Botanic Garden,

* All of these were kindly named for me by Dr. Brothems of Helsingfors, Finland.

Calcutta; the Royal Gardens, Kew; the British Museum (Botanical Department), South Kensington; the Royal Botanic Gardens at Edinburgh, Berlin, St. Petersburgh, Vienna, and Florence; to M. Copinean, Doullens, France; Dr. M. Gandoger, Arnas, France; Dr. E. Rosenstock, Gotha; Professor R. Schlechter, Berlin; M. A. TJ&teri, Zurich; Herr Richter Lajos, Budapest; J. Sykes Gamble, Esq., F.R.S., C.I.E., etc., England.

The following special collections were also distributed:—to the Reporter on Economic Products to the Government of India—specimens of economic plants; to the Forest School Herbarium at Dehra,—specimens of trees and shrubs; to 0. W. Hope, Esq.,—specimens of North Indian ferns; to Mr. T. W. Naylor Beckett, New Zealand,—a large collection of Indian mosses; to the Principal of the Veterinary College, Lahore,—a mounted set of Indian fodder grasses.

Seeds and bulbs,—Seeds, chiefly of North-Western Himalayan plants, were sent to:—Kew, Edinburgh, Cambridge, Dublin, Berlin, St. Petersburgh* Vienna, Paris$_f$ Florence, Zurich, Budapest, Geneva, Baden Baden, Strasburg» also to G. W. Wilson, Esq., F. R. S., Weybridge Heath; W. Thomson, Esq-> Ipswich; A. K. Bulley, Esq., Neston, Cheshire; Douglas Freshfield, Esq.,' East Grinstead. Rhizomes of *Acorus Calamus* and of *SemerocalUs fu*^{iva} were sent to Professor Solms-Laubach, Strasburg; and bulbs of different kinds of *Iris* to Sir Michael Foster. Over two maunds of fodder-grass seeds were distributed to various places in India, through the Superintendent of trie Saharanpur Garden.

LOCAL FLORAS AND OTHER PUBLICATIONS.

The manuscript of my "Flora of the Upper Gangetic Plain" has been roughly completed to the end of Calyciflorse. I am disappointed at having apparently made so little progress with the work during the past year. The determination of the specimens contained in the large collections recently received from the comparatively little-explored tracts in Northern Ouclh, tooK up a good deal of my time during the last cold season; and the incorporation of many additional species to the flora of this area has necessitated considerable alterations in the analytical keys to the genera and species. The suggestion proposed by Sir Joseph Hooker, and approved of by Sir George King and Dr. Prain, that the area of the Upper Gangetic Plains flora be extended so as to include the whole of the southern and western watershed of the Junina and Gangetic basin, is being adopted. The additional tract of country includes the whole of Bundelkhand, Malwa (north of the Vindhia range)* Mey war, and a small portion of Eastern R&jputana. The late Mr. Edgeworth's "Flora of Banda", published in the Proceedings of the Linnean Society in 1866, forms the basis of our information regarding the vegetation of Bundelkhand, I have myself travelled over the greater portion of this district and collected a large number of specimens; also in Meywar and certain parts of East Edj put ana.

The monograph I am preparing on the orchids of North-Western India will contain descriptions of all the species known to occur within that area. The illustrations, about fifty in number, will be limited to such species as have not already been figured in the four volumes of the Sikkim orchids.

Of these, forty-four are now ready, including twelve new species. The following is ^ list of the drawings completed since the date of my last report:—

***Oberonia Falconeri,* Hook. f.**
***Jficrostylit* n. sp. (allied to M. Wallichü, LindL)**
***Oreorc/iis indica,* Hook. f.**
***Oreorc/iis* n. sp.**
***Dendrobium Gamblei,* King and Pántl.**
***Dendrobinm alpestre,* Royle.**
***Dendrobium normale,* Fale. (believed to be a peloriate state of D. tiinbriatum, Hook.)**
***Eria alba,* Lindl.**
***Calanthe tricarinata,* Lindl. (Plate 823 of the Sikkim orchids appears to be a different species.)**
***EulopJiia* n. sp. (allied to E. campestris, Wall.)**
***Mulophia* n. sp. (allied to E. Mannii, Hook, f.)**
***Cymbidium macrorhizon,* Lindl.**
***Cyrubidium* n. sp. (near the Japanese C. virescens, Lindl.)**
***Littera* n. sp. (allied to L. Liudleyana, King and Pantl.)**
***Goodyera b'tjlora,* Hook. f.**
***Apliyllorchis* n. sp. (near A. alpina. King and Pantl.)**
***Gastrodia orobanchoidea,* Benth.**
***Orchis latifolia,* Linn.**
***Herminium gramineum.* Lindl.**
***Herminium* n. sp. (near H. angustifolium, Benth.)**
***Habenarla intermedia,* Don,**
***Mabenaria Zaioii,* Hook. f.**
***Habenaria Qriffithii,* Hook. f.**
***Cypripedium cotdigerum*% Don.**

*A List of the Trees and Shrubs of the forests of Pilibhit, Northern Oudh*9 *and Gorakhpur.*—This list was compiled last year for the use of Forest officers of the Oudh circle on the suggestion of Mr, Eardley-Wilmot, the Conservator, to whom I am much indebted for the assistance given to my plant-collectors in 1898.

OFFICE ESTABLISHMENT.

My draughtsman, H. Hormusji Deboo, has completed several very excellent drawings of North-Western Indian orchids; also of some Indian Boragineae, and of other plants of which plates a*e required for publication.

The Head Clerk, Umrdo Singh, and his assistant, N. Hutchinson, havo woiked very well during the year.

APPENDIX.

Financial Statement of the Botanical Department, Northern India, during the year 1899-1900.

BOTANICAL DBPABTMBVI.	EXPENDITURE.							RECEIPTS.			
	Director's salary.	Exchange compensation allowance.	Establishment.	Travelling allowances of Gazetted Officers.	Travelling allowances of Establishment.	Contingencies.	Total.	Fodder grass book*.	Fodder grass albums.	Miscellaneous.	Total.
	R a. p.	£ a. p.	£ a. p.	R a. p.	£ a. p.	R a. p.	R a. p.	£ a. p.	R a. p.	R a. p.	R a. p.
Budget Grant for 1899-1900	12,000 0 0	860 0 0	*4,070 0 0	1,700 0 0	300 0 0	2,240 0 0	21,170 0 0	...	...	...	...
Expeuditure duriug 1899-1900	12,000 e o	730 5 10	4,066 0 0	1,335 7 0	247 9 9	2,228 2 1	20,607 8 8	...	...	...	...
Balance	...	129 10 2	4 0 0	364 9 0	52 6 3	11 13 11	562 7 4	...	...	...	...
Realised by sale dining 1899*1900	...	...	...	...	...	...	...	20 12 0	...	...	20 12 0

• Includes R52 paid for deputation allowance.

Mussoorie;
TU 26th June 1900.

J. F. DUTHIE,
Director, Bot. Vept., ***Northern India.***

Eeport on the Botanical Survey operations in the Bombay Presidency for thfc year 1899-1900, ty Mr. G. A* G&niniie, OSicer in charge, Botanical Survey, Bombay Presidency.

I took charge of the office of the Botanical Survey, Bombay Presidency, on the 2nd August.

Tours.—As the prevalence of plague caused a cessation of my college duties on the 15th August, advantage was taken of the opportunity to make a three weeks' tour in the Gh&ts, in the vicinity of Khandala and Lanauli. The rainy season plants were in full bloom, and I was fortunate enough to collect some rare terrestrial orchids, which are only to be obtained at this season of the year.

Owing to the failure of the monsoon the projected tour through the Dangs could not be undertaken, so, during three weeks in October, I explored parts of the Belgaum and North Kanara districts ; later on, in December, Mr. R. K. Bhide, the herbarium-keeper, explored the Sirsi and Kumta talukas of the North Kanara Collectorate. A very fair collection of specimens was made-

Special efforts were made to bring back living plants of orchids, aroids, lilies, gingers and other plants difficult to determine in a dry state, so that they could be carefully studied in all stages of growth. Carefully executed drawings of these plants, as they come into flower, are made by Mr. R. K. Bhide, who is a trained artist. This series of pictures will ultimately prove of value as some of the species already figured appear to be quite new to science. The unknown plants will be referred to specialists for determination. The vegetation of Kanara presented so many points of interest that I decided to continue my researches there. When these are complete I shall embody the results in a special report.

Herbarium.—The following sheets of specimens collected by members of this Survey were placed in their permanent positions after careful identification :—

	Sheets.
Plants collected on various parts of Poona Ghats	704
„ „ by G. Gammie in North Caiiara	630
„ „ by Mr. Bhide „ „ „	390
Total	1,724

The following specimens were received from other sources :—

	Sheets.
From Royal Botanic Garden, Calcutta	87
„ G. Gammie's private Herbarium	157
Total	244

In addition to these, a few specimens of interesting plants were contributed by Mr. *W. P.* Symonds, C. S., and Major Jencken, R. A. M. C.

A number of referencas regarding the identification of plants were dealt with during the year.

Owing to lack of time I was unable *to* arrange for the distribution of duplicate specimens to the different herbaria of the Botanical Survey, but I tope to overtake this part of my duties during the ensuing year.

Publications.—Another part of the synopsis of the ffora of Western India has been published in the Journal of the Bombay Natural History Society by Mr. Woodrow, but a copy has not reached me in time to be included with this report.

Experimental Culture of Sisal Hemp.—The station established at Nandgaon, about 8 miles south of Lanauli, was visited by me during December. In spite of the adverse influence of the previous monsoon the plot of 400 plants was found in a thriving condition, although it had received no attention whatever for several months. It was too late in the season to make any extension of planting in this area, but I purpose, during the coming monsoon, to fill up the entire block of three acres marked off for the experiment. There is now a large stock of young plants in the garden of the College of Science, and as these are taking up space urgently required for other experimental plants, I hope to make arrangements for their disposal.

Eighty-seven plants were supplied gratis to various applicants, mostly Forest officers. In August, five of the original consignment of Sisal plants (obtained in 1892) showed signs of flowering. These plants were receiving no water beyond that afforded by the scanty rainfall, but the growth of the inflorescence proceeded steadily apace and the resulting poles appeared well-developed and fully furnished with flowers. These flowers were green in colour and fleshy in texture, and their stamens were wholly abortive so that no fruits were formed. In their stead, however, multitudes of bulbils were produced. To furnish a basis for future comparisons, the bulbils were carefully collected from each plant separately, and counted before being put out.

The results worked out as follows :—

Months.	Bulbils collected from plant No. 1.	Bulbils collected from plant No. 2.	Bulbils collected from plant No. 3.	Bulbils collected from plant No. 4.	Bulbils collected from plant No. 5.
January	2,450	3,025	845	650	None
February	140	215	15	60	725
March	222	375	105	600	400
April	90	95	77	150	800
TOTAL .	2,902	3,710	1,042	1,460	1,925

= Grand Total of 11,039.

Eighty-five suokers were also yielded by these plants, making an average of 17 from each.

The bulbils when ready to maintain a separate existence spontaneously detached themselves from the parent plant and were collected where they fell on the ground.

*Sabai grass experiment**—Several applications from Forest officers for seeds were complied with. The small plot under cultivation can be conveniently kept up to supply the small annual demand for seeds. The crop of grass was cut, and disposed of to the Deccan Paper Mills. It was reported on as being of good quality.

COLLEGE OF SCIENCE, POONA; }
[**GEORGE A. GAMMIB,**
The 30th June 1900. -)

Report /^)n ^e Botanical Survey Operations in the Madras Presidency cover' *uag* the period from 17th December 1898 to 31st March 1900, by the Government Botanist, of Madras.

I reported myself in Madras on the 17th December 1898. As no decision Had been arrived at regarding the character of my work nor where my head-quarters should be placed, I remained there collecting and examining the local Iora until March 1899.

It having been decided that I should occupy the herbarium built by the Government Botanist (Mr. Lawson) at Ootacamund, I entered it on April 12th, but as no accommodation had been provided for the Government Cinchona establishment, I was unable to take possession and unpack the herbarium cases until July 21st. Owing to my prolonged visits to the plains and the short stays at head-quarters, I was not able to complete the furnishing of the office until a few days before descending to the plains on December 1st. TJpon my return three months later, the whole of March was taken up with budget details as I had to spend practically the whole of my year's money during that month. In the middle of March, I again visited the plains for 11 weeks, l^rom this it will be seen that the collections made during the tours mentioned below have not yet been worked out, and a report of the additions to the collectiens cannot at present be prepared. These facts have been represented to the Board and it has been decided that in future there shall be longer periods spent at Head Office, and I have every hope to work off accumulations in the near future. The work of properly naming the specimens will be much lighter in later tours as the flora becomes more familiar to myself and my staff.

I subjoin a list of the tours at present made and the periods spent at Head Office. The remainder of the time has been given to Economic Botany, specially the subjects of cane-disease, ground-nuts and date palms.

1. *Madras,* December 17th, 1898 to March 22nd, 1899.

The details of work were arranged and the staff selected. During this period collections were made of the plants in the neighbourhood of Madras.

{Ootacamund, April 5th till May 12th, 1899.)

2. *Tinnevelly District,* May 18th to July 15th, 1899.

Collections were made at Ambasamudram at the foot of the hills, at Mundanthorai (600 feet) in the deciduous forests, at Kanni Katti (2,500 feet) in the evergreen forests, and^ilso at Nazareth on Kudiraimalai Tehri, one of the curious red sand deserts for which Tinnevelly is famous.

{Ootacamund, July 16th till August 16th, 1899.)

3. *South Arcot District,* August 22nd till September 30th, 1899.

During this tour a small collection was first made at Cuddalore on the sea shore ; then halts of ten days each were made at Shanikulam in the mixed forest of the plains and at Melpat (3,000 feet) on the Tenmalai Hills, and many Plants collected.

{Ootacamund, October 15th till December 1st, 1899.)

4. *Qanjam Agency Tracts,* January 19th till February 17th, 1900.

Tlie tour here consisted of a rapid march with the Agent. The greater Part of the marches were through dry sal forests, and it was frequently difficult to find any plants at all in flower. It was not possible to leave the Agent's camp in search of more suitable localities and the rapid marching each day did

not leave any time for working out the plants collected. In spite of these disadvantages and the fact that Mr, Gamble had made collections in these tracts, something like a dozen species new to the Western Peninsula were obtained. A visit at a more favourable time of the year would be productive of very interesting results.

(Ootacamnnd, March 1st till April 20th, 1900.)

OOTACAMTJND,
Dated 10th July 1900.

C. A. BARBER,
Government Botanist, 3Iadra.fi.

G. I. C. P. O.—No. 254 K. & A.-10-8-1900.—350.—F. C. K.

Report of the Director of the Botanical Survey of India for the year 1900-1901.

THE allotment for Botanical Survey in Burma, Assam, ana Bengal during we year ending March 1901 was fully expended. In Burma, collections chiefly ot orchids, were made by Mr. J. C. Prazer, Kalewa, Upper Burma, and during *ne* latter half of the year two native collectors collected in the South J-enasserim district, where their work was more or less supervised from time to tin by the Forest Officers of the Tenasserim Forest Circle. In Assam in the cold weather a special collection of grasses was made by a native collector, who accompanied and worked under the direction of Dr. Bourne, F.R.S., of Madras, who was then making a trip to Assam up the Brahmaputra. Towards the end of the cold weather Mr. Norman Gill, the Assistant Curator of the Royal Botanic Gardens, was deputed to collect in the region of Assam about 100 miles to the east and south-east of Shillong. This tract which has not hitherto been explored botanically has been made accessible by the constructing of a road between Gauhafci and Silciiar. In Bengal collections were made also by Mr. Gill in Tippera in addition to his Assam collections. In the Darjeeling district trained Lepcha collectors were kept at work under the supervision of Mr. G. H. Cave, Assistant on the Government Cinchona plantations.

2. *Survey of Northern India.*—The report of this Survey for 1900-1901, prepared by Mr. Duthie who held charge of the Department throughout the year, is submitted in original.

3. *Survey of the Bombay Presidency.*—Mr. G. A. Gammie, Professor of Botany and Agriculture, has been in charge of this Survey throughout the year, his report is submitted in original.

4. *Survey of Southern India.*—Mr. C. A. Barber, Government Botanist, Madras, became an effective officer of the Botanical Survey early in the year under review, and has been in charge throughout the remainder of the year. He has submitted no report direct to the Director of the Botanical Survey, but an extract from his annual report as Government Botanist to the Board of Revenue, Madras, has been forwarded to the Director by the Board of Revenue with a dorsement by the latter to the effect that the copy of the extract relates to the work of the Botanical Survey of India. A copy of the extract is submitted.

5. ***Publications.*—The thirteenth part of the *Records of the Botanical*** Survey of India, giving Mr. Gamble's account of a Botanical Excursion to the South Lushai Hills made by the writer of this report, was sent to press in January of the current year, and is now in circulation. Part VIII of the synopsis of the *Flora of Western India* by Mr. Woodrow, formerly Officiating Superintendent of the Botanical Survey of the Bombay Presidency, has been published. A copy of it accompanies Mr. Gammie's report. A severe and prolonged illness has seriously impeded Mr. Duthie's labours on his *Flora of the Upper Gangetic Plain*, which otherwise would have been well on toward completion.

6. ***Economic and Agricultural Botany.—The*** **Director of the Botanical** Survey has during the year published a paper of great economic importance, embodying the result of his investigations into the true sources of the various timbers known as *Pactouk.* Two new timber yielding trees, one from Burma, the other from Assam, have also been described and published by him during the year. A good deal of attention continues to be paid by the Director to the indigenous leguminous crops, the results of which may form a subject for future publication, but which cannot be detailed here. The Director has given special study during the year to the clearing up of the obscurities enveloping

the true botanical position and distribution of certain extra-Tndian species or *Indigo/era,* which have recently become of practical importance to Indigo planters. The Director will take «the opportunity of his having been granted leave to Europe t-) consult several European herbaria in clearing up doubtful points. Until that has bsen done, definite conclusions cannot be attained.^ The true source of chaulmoogra oil has been now determined by the Director in conjunction with Dr. Watt, C.I.E., to be *Taraktogenòs Kurzii.* During the year supplies of *Faspalum dilatatum,* a recently introduced drought-resisting fodder grass f,rom Australia, were distributed freely all over India. The results of the investigations into the causes of sugarcane disease in Bengal, undertaken by the writer of this report, have been published during the year. The other economic enquiries which have been undertaken during the year by the officers in charge of the Northern India, Bombay, and Madras Surveys, respectively, are sufficiently referred to in the reports of those officers, and it is unnecessary to recapitulate them here.

7. *Staff.*—Major i'rain, I.M.S., the Director of the Survey, held charge ot the office throughout the official year. Since the close of the official year he has gone to Europe on six months' leave. Exceedingly short notice was given to him by telegram of his leave having been granted. He had, however, to make arrangements for the work of the Survey to be carried on. Accordingly* in the absence of specific instructions—which at the moment of writing still remain to be issued—from Government, the writer of this report formally took over charge of the office of Director of Botanical Survey of India, and reported that fact to Government. The other Surveys have been held charge of hy their proper officers throughout the year in the Survey of Northern India ancl the Bombay Presidency and, with official effect from the 25th April 1900, in the Madras Survey. Mr. E. J. Butler, M.B., was appointed Oryptogamic Botanist to the Government of India, by the Right Honourable the Secretary of State for India, on the 2nd January 1901. He became an effective officer ot the Botanical Survey of India subordinate to the Director on 17th March 1901. At that date he was in Ceylon on his way to Calcutta, where, however, he had not arrived at the close of the year under review.

A. T. GAGE, M.B., *Captain, I.M.S.,*

Acting Director, Botanical Survey of India-

Annual Eeport of the Director of the Botanical Department, Northern India, for the year 1900-1901.

I was at head-quarters till the 10th of April, when I started for Jaunsar to join the camp of the Forest School and accompanied them on the usual hill tour through the forests of Jaunsar and portwnj of Tehri-Garhwdl until the 31st of May. I arrived on the 2nd of June at Mussoorie, where I remained until the 15th of October, except for a few days spent at Saharanpur between the 10th and 15th. I remained at Head-quarters from the 15th of October till the 4th of February, on the evening of which day I started for Calcutta. With the kind assistance of Dr. Prain I was able to get some very satisfactory work done at the Herbarium of the Botanic Garden during the two weeks I spent there. On my return to Saharanpur I halted for a few days at Allahabad to inspect the Kushru Bagh. On the 16th March I left for Dehra to assist at the Final Examinations at the Imperial Forest School, and remained there until the end of the month.

BOTANICAL TOURS.

Northern Oudh and Nepal Terai.—My head plant collector, Inayat Khán, was sent off early in April to collect botanical specimens in the northern districts of Oudh and the adjacent portions of the Nepal Terai. I wish to acknowledge the great assistance he received from the officers in charge of the forests in the Gonda, Bahraich and Kheri divisions. Of the many interesting plants found during this tour is a small tree called *Pithecolobium Lebbek*, Benth. Fl. 168, belonging to the natural order Leguminosæ, and allied to Adenanthera. It was originally discovered by Mr. A. K. Forest Department, in the northern Circle of the Nepal frontier, growing near water. He was further collecting the tree in flower as well as in fruit. The *Eupatorium* by ton? is C^AOZM-natives of America. Another interesting plant to the nat Rubiaceæ. It was *thus ocoidentaUs, L.*, a shrub Specimens of the same plant found growing in hills in the Kheri district and in the Pilibhit district of Assam. It is also

Under the name of "Globe flower." Two new species of *Brachystelma* (Nat. Ord. Asclepiadaceæ were also discovered during this tour, and specimens of several interesting orchids were collected.

My head plant collector, Inayat Khan, undertook a tour in the rainy season of last year. He left Saharanpur on the 18th of July and returned on the 6th of October. His collecting tour was confined to the Kumaon portion of the Himalayas. Specimens of all the orchids he could find. As both flowering and fruiting specimens are of every kind of balsam (Impatiens), as well as with difficulty determinable if collected and dried in the ordinary way, he was also ordered to dry very carefully in a preservative solution some flowers of each species collected. These were collected specially at the request of Sir Joseph Hooker, who is now preparing a revised account of all the Indian species. The collection from Kumaon was packed together with the glass tubes containing flowers in solution, and was gratifying to hear from him how completely satisfied he was with the excellent condition of the specimens prepared by the collector. The latter also was much pleased on hearing that Sir Joseph Hooker had proposed to name one of the

many novelties of this collection after him. The collection of orchids was also a very good one, and contained many varieties, such as :—

Bulbophyllum affine, *Lindl.*
Coelogyne ovalis, *Lindl,*
Cy rubidium macrorhizon, *Lindl**
„ pendulum, *Swartz.*
Dendrobium chrysanthum, *Wall.*
Habenaria arietina, *llkf%*
„ Elisabeth©, Duthie *[ined.)*
„ n. sp. allied to H. reaiformis, *Hkf.*
Herminimum Duthie, *Hkf.*
Liparis Dutbiei, *Hkf.*
„ longipes, *Lindl.*
Orchis habenarioides, *King and Panllhig.*
Ornithochilus fuscus, *Wall.*
Saccolabimm papillosura, *Lindl.*

A large number of very interesting plants belonging to other natural orders were also collected.

Tours undertaken in the neighbourhood of Mussoorie.—One of my plant collectors was employed during the rainy season in procuring from Dehra Dun and the Siwalik range specimens of certain plants required ia connection with my "Flora of the Upper Gangetic Plain." He was also sent, in company with a trained collector belonging to Mr. Phillip Mackinnon, to Bok Hill in Tehri-Garhwal, where many rare orchids were found, also a very curious and rare Orobanchaceous plant, called *JBoschniackia himalaica,* found on the roots of Rhododendron arboreum. Specimens of another very remarkable leafless parasite, belonging to the same natural order, were sent to me from Deoban, beyond Chakrata, by Mr. B. B. Osmaston. It was originally discovered three years ago by Mr. Gleadow, Deputy Director of the Forest School, and has recently been described and published in the Journal of the Asiatic Society 0f Bengal, by Dr. Prain and Mr. Gamble, under the name of *Gleadovia ruboruw*** It is found abundantly on the roots of Hub us nivens, which forms a large portion of the undergrowth in the forests on the northern slopes of the Deoban range.

THE HERBARIUM.

The additions to the Herbarium during the past year include a very fine collection of American grasses received from the Agrostologist to the Department of Agriculture, Washington; an interesting set of Natal plants from Mr. J. Medley Wood; a collection of New Zealand mosses from Mr- T. W. N. Beckett; a valuable set of Assam ferns from Mr. Gustav Mann (purchased)- From the Herbarium of the Royal Botanic Garden, Calcutta, 331 sheets of mounted specimens have been received. Mr. J. H. Lace has sent a large collection of specimens from Pángi; it includes some interesting additions 1o the Flora of British India, also a new species of orchids. Mr. Qpendranath Kánjilál, whose minual of the forest flora of the School Circle, will soon be published, has contributed many interesting specimens. Mr, W. Oollan, Superintendent of the Saharanpur Garden, has presented for the Herbarium a set of named i'ungi, collected locally. These specimens are interesting as showing the result of a process invented by him of drying without pressure in hot air, it has proved a very successful means of preserving the more deliquescent kinds, I amag[a]i[a] much indebted to Mr. P. W. Mackinnon for numerous specimens of orchids and other plants collected in Dehra Dun and in the neighbourhood of Mussoorie. Finally, from the collections brought from Oudh and Kumaon, a large number of selected specimens have been mounted for the Saharanpur Herbarium.

LOCAL FLORAS AND OTHER PUBLICATIONS.

The progress made towards the completion of the "Flora of the Upper Gangetic Plain" has occupied the greater portion of my time. I much regret, however, that owing to a severe attack of influenza caught in Dehra last March followed very soon afterwards by acute sciatica, from which I am now suffering, the work has unfortunately been very much interrupted, A considerable portion of the work is ready for printing, and I shall do my best to have the"

whole of the manuscript in the hands of the Press hy the end of December next, lhe material in preparation for the illustrated volume on the orchids of North-West India is being added to as far as time and opportunity admits of. Forty-eight drawings have been despatched to Calcutta to be lithographed, and those which remain for the completian of the plates will be submitted before the end of the calendar year.

DISTRIBUTION.

To the Herbarium, Royal Botanic Garden, Calcutta, a large" collection of mounted specimens of North-West Indian plants.

To the Department of Agriculture, "Washington, United States, America, a large collection of Indian grasses.

To J. Sykes Gamble, Esq., C.I.E., P.R.S., etc., a collection of Indian grasses.

To C. B. Clarke, Esq., F.R.S., etc., a collection of Indian Cyperaceae.

To Sir Joseph Hooker, G.C.S.L, E.JJ.S., etc., sets of Impatiens Spp., from Kumaon and other parts of the Western Himalaya.

To Sir Dietrich Brandis, K.C.I.E., tf.ii.S., etc., specimens of Indian trees and shrubs.

To Lord Arthur Cecil, President of the Horse-breeding Commission, sets of mounted specimens of Indian Fodder grasses, also a copy of " The Fodder brasses of Northern India " (in three psrts).

To Mons. H. Buysman, Holland, specimens of economic plants.

To Professor Solms-Launbach, Strassburg, roots of Acorus Calamus and of •Hemerocallis fulva.

To the Superintendent of the Saharanpur Garden, 7 maunds and 25 seers or fodder grass seed.

Seeds of Kumaon plants were sent to the Royal Gardens at Kew, to the Botanical Gardens at Edinburgh, Dublin, Cambridge, St. Petersburg, Berlin, Vienna, Florence, Strassburg, Geneva, Zurich, also to Mr. W. Thompson at Ipswich, and to Mr. T. Ware, Tottenham.

TV , Wood specimens of *Piptadenia oiidhemis* were sent to Mr. Gamble, Sir •Dietrich Brandis, and to the Director of the Forest School at Dehra.

OFMCE ESTABLISHMENT.

The draughtsman, H. Hormusji, Daboo, has, as usual, been doing excellent J^ork during the year. I am glad also to be able to report favourably regarding the work done by my Head Clerk, Umrao Singh, and the Assistant Clerk, ^ Hutchinson.

J. F. DUTHIE,

Director^ Botanical Dept.> N. India.

MUSSOORIE ;

Me 5th June 1901.

APPENDIX.

Financial Statement of the BUanieal Department, Northern India, during ike year 1900-1901-

BOTANICAL DBPAETHKNT.	EXPENDITURE.							RECEIPT.			
	Directors[1] salary.	Exchange compe isa-tion ullowance.	Establish-meat.	Travelling allowance of Gazetted Officers.	Traveling allowance of Estab-lishment.	Contin-gencies.	Total.	"« odder GIMBB books.	Fodder Grass albums.	Miscel-laneous.	Total.
	R a. p.	R a. p.	R a. p.	R a. p.	R a. p.	R a. p.	R a. p.				
iudget Grant for 1900-1901.	12,000 0 0	750 0 0	4,070 0 0	1,700 0 0	300 0 0	2,240 0 0	21,06> 0 0	...	...	...	...
Sxpenditure during *1900-1901.	12,000 0 0	746 13 2	•4,172 2 7	1,388 6 0	261 11 9	2,183 0 3	20,750 4 9	...	...	...	...
Balance	...	3 2 10	...	313 10 0	38 1 3	56 15 9	309 11 3	...	...	...	...
Realized by sale during 1900-1901.	...	...	...	...	...	...	...	27 2 6	15 0 0	...	42 2 6

* Ivelud[rt]s Rllfl nnid fir holt'me allowance to the Drnftsmnn at MnsROorie.
The actunl expenditure during the year undir thib h ad, IU.U56-2-7.

J. F. DUTHIF,
Director, Botanical Department, Northern i«

MUSSOORIE;
iheoJi June DO/.

Report on the Botanical Survey Operations in the Bombay Presidency for the year 1900-1901, by G. A. Gammie, F.L.S., Officer in charge of the Botanical Survey, Bombay Presidency.

I held charge of the office of the Botanical Survey, Bombay Presidency, throughout the year.

1. *Tours.*—Daring the hot-weather vacation I travelled through parts of the Dharwar and Kanara Collectorates, and also the forests bordering on Goa territory from Castle Rock to Londa. During the autumn vacation I toured along the Ghats on the southern and western sides of the Poona District, re-collecting many of Mr. Woodrow's discoveries to provide material for distribution. I also paid a visit to Nandgaon to inspect the experimental plantation of Sisal Hemp. Mr. Bhide, the Herbarium Keeper, completed a tour from Poona to Nagotna. He found many interesting plants, but his purpose was more especially to collect good material of *Podostemon Jlookerianus* and other species on behalf of Mr. J. C. Willis, the Director of the Royal Botanic Gardens, Peradeniya, Ceylon, who is making a special study of the order *Podostemonacece.* Mr. Willis, during his visit to the Bombay Presidency, in search of these plants, was good enough to give us valuable information and identifications of the materials in this Herbarium.

During the tours special attention was devoted to obscure plants and many—specially orchids—were brought back alive to Poona, so that Mr. Bhide could figure them at leisure as they came into flower.

Drawings of many Bombay orchids were despatched to the Bombay Natural History Society for future publication in its Journal.

2. *Herbarium.*—The following sheets of specimens were collected by members of the Department and were incorporated in the Herbarium after identification :—

Plants collected by G. A. Gammie in various parts of Kanara, Belgaum, and Poona Districts	*4-92,* sheets.
Plants collected by Mr. Bhide between Pooua and Nagotna	20iJ „
Specimens of cereals 'grown uoder their vernacular names in Poona Farm and referred for identification by the Director and Deputy Director of Agriculture	4£8 „
TOTAL	J,129 „

The following sheets of specimens were received from other sources :—

From Royal Botanic Garden, Calcutta	*279* sheets.
„ W. P. Symouds, Ksq , I.C.S , Poona	93 „
„ Superintendent, Victoria Gardens, Bombay	33 *a*
„ Empress Gardens, Poona	10 „
„ Abdul Kader, Esq., Mir Munshi to the Commissioner in Sind	12 „
„ miscellaneous sources	*7* „
TOTAL	434 *99*

To Mr. Symonds, the Director of Agriculture, who is aa enthusiastic botanist, I am indebted for interesting plants collected by him when travelling and also for samples of plants, said to have been utilized by the people when reduced to straits by famine. I append a list of these plants identified by me as the information may pitove of interest to botanists :—

Plants used for their leaves are: —

Portulaca suffruticosa, *Wight, {vern.* Morad).
„ quadrifida, *Linn. {vern.* Chighal).
Abutilon indicum, *G. Don. {vern.* Kachnia).
Tribulus terrestrial, *Linn, {vern,* Sarata).
Rhus mysorensis, *Ileyne. {vern.* Ambogna).
Launsea nudicaulis, *Less. {vern.* Pathari).
Dregea volubilis, *Bth. {vern.* Pliandi).
Rivea hypocrateriformis, *Choisy. {vern.* Fangi).
Hygrophila Serpyllum, *T. Anderss.^ {vern.* Godadi).
Digera arvensis, *Forsk. {vern.* Kern jar). ,
Cbenopodium album, *Linn, {vern,* Chil).

The only bulbous plant used was :—

Cyperus bulbosus, *Vahl. (vern.* Tbeg).

The plants utilized for their seeds and grains are ;—

Indigofera linifolia, *Retz. (vern.* Pnndarpbale).
„ glandulosa, *Willd. (vern.* Defri, Barbada).
„ cordifolia, *Linn. (vern.* Vakal, Godadia).
Ocimum canum, *Sims.*
"Cyanotis axillnris, *R. 8f S. (vern.* Damrs, Narids, Icbaka).
Scirpus maritimns, *Linn. (vern.* Dero, Cbids").
Panicum prostratum *Lamh. (vern.* Pabatu, Bateru).
„ colonum, *Linn. (vern.* Samo).
„ flavidum, *Retz. (vern** G-arin).
Setaria verticillata, *Bexuv. (vern* Kulelu).
iEluropus villosus, *Trin.* (vern. Del.)-
Eleusine segyptiaca, *Desf. (vern.* Manacha ; Manacbobi; Mancbi; Ancbi Mancbi).
Dinebra aiaMcn, *Jacq. (vern.* Kbarin).
Polytoca barbata, *Sbapf. (vern.* Khad-Kbadio).
Aplnda varia, *Hacft. (vern.* Bbangaru).
Antbistiria ciliata, *Linn. f. (vern.* Ratadin).
Iseilema Wigbtu, *Anderss. (vern.* Gadhu),
„ las urn, *H*ck. (vern.* Rabn tbolvi).
Iscbsemum rugosnm, *Salisb. (vern.* Varcbu).
Andropogon annulatus, *Forsft. (vern.* Zangroo).
„ contortus, *Linn. {vern.* Soorwalu).
Cbloris pallida, *Hook. f. (vern** Cbakalio).
Aristida (sp. inc.) *(vern.* Tbolvi).
Sporobolus diander, *Beauv. (vern.* Dbul).
Eragrostis interrupta, *Beauv. (vern** Dhadi).

Of all these plants, *Panicum colonum (Samo)* seems to have been most esteemed as a makeshift for better food.

The cereals grown in the Poona Farm in sample plots under many vernacular names had th^se correlated with their proper botanical designations and, at Mr. Mollison's request, I drew up for use, in his forthcoming Text-Book on Agriculture for Bombay, a botanical classification of all the cereal crops grown in the Bombay Presidency, with all the vernacular names known to us arranged according to my identific ations.

Mr. Abdul Kader, Mir Munshi to the Gomn:i3sioner in Sind, sent some interesting plants, and his specimens were often accompanied by valuable notes on their economic uses.

The Superintendents of the Victoria Gardens, Bombay, and Empress Gardens, Poona, were good enough to send me specimens o£ plants unknown to them as they came into flower.

Information regarding doubtful plants was supplied to Dr. T. Cooke, C.I.B.j who is elaborating a Flora of Bombay in the Herbarium at Kew, and he, in return, from time to time generously sends notes which supplement or correct our knowledge of Bombay plants.

Mr. G. M. Woodrow, my predecessor, still retains an interest in the Survey work, for which he did so much during his service, and, while drawing up the final part of the list, he supplied me with correct names for many gatherings of specimens.

3. *Publications.*—The final number of Mr. Woodrow's Synoptical List of the Flora of the Bombay Presidency, was published in the Journal of the Bombay Natural History Society.

4. *Experimental Culture of Sisal Hemp.*—The station at Nandgaon was fully planted up during the early part of the rains and the plants under observation there now number 3,000. The plants were in a flourishing condition at the time of my visit, and there is a certainty of the plantation ultimately proving a success. Twenty-one thousand young plants and bulbils were distributed to various applicants and a large number have been promised for this season to the Divisional Forest Officer at Nasik. As the area at my disposal is so circumscribed and as Sisal culture has become established in several parts of India, this Department may now restrict itself to the growth of plants solely for distribution.

During the year ten plants flowered and produced bulbils which were gathered and planted. The bulbils were carefully collected from each plant separately and the results were as follows:—

Number of Plant	1	2	3	4	5	6	7	8	9	10	
Number of Bulbils	2,820	3,152	3,501	3,320	2,912	1,962	1,787	1,512	1,772	3,012	
									TOTAL		25,750

5. *Sabai Grass Experiment.*—No. applications for seeds were received during the year. The crop of grass, as* usual, was cut and disposed of to the Deccan Paper Mills. It was reported on as being of good quality. The proprietors of the Deccan Paper Mills are now growing this grass successfully as a commercial venture, so, in future, this Department need only preserve a number of plants sufficient to supply applicants with seeds, and the ground, occupied so long by this experiment, can be devoted to the working out of other problems in Economic Botany,

G. A- GAMMIE. -

THE FLORA OF WESTERN INDIA.

BY G. MARSHALL WOODROW, Professor of Botany, COLLEGE OF SCIENCE, Poona.

PART VIII.

{Continued from page 526 of Vol. XII.)

CLXIIL—PALME2E—(contd.)

33. *Borassus.*

B. flabelliftr, *Linn.*, F.B.I.—VI-482. *Tad.* Konkan. Planted.

34. *Gocos.*

C. nucifera, *Linn.*, F.B.I.—VI-482. *Narel. Cocoanut Tree.* Konkau. Planted.

CLXIV.—PANDANE*:.

1. *Pandanus.*

P. fnreatus, *Roxb.*, F.B.I.—VI-484
P. fascicularis, *Lam.*, F.B.I.—Vl-485. *Keura.* N. Kanara. Planted widely.

CUYCI.ANTHACB.2B.

Carludovica. (Tropical America.)

C. palmata, *Ruiz, and Pav. 8yst.2§l. Nich. Die. Gard.* 268. Gardens. Nov-Feb.

CLXV.—TYPHACE*:.

1. *TypJia.*

T. elephantina, *Roxh.*, F.B.I.—VI-489. *Mota pan-kanis.* Planted. Bombav.
T. angustata, *Chaub. and Berry.*, F.B.I.—VI-489. *Pan~kanis.* Poona. Aog.

CLXVI.—ABOIDE-E.

Cryptocoryne.

C. retrospira^B, *Kunth.*, F B.I —VI-493. Penn River. *Dalzell.* Nov.
C. spiralia, *Fisch.*, F.B.I.—VI-494. Deccan. Nov.
C. c gnata, *Schott,* F.B.I.—Vl-494. Koukan. *Mr. Law.*
C. Roxburghii, *Schott.*, F.B I. VI-494. PoonR. Nov.
C. Dalzellii, *Schott.*, F.B.I.—VI-495. This remarkable plant is represented at Kew by half a sbeet of fruits ia various stages, and a drawing of a leaf, evidently sessile, having measures about 2J by 1 inch, lanceolate, with serrulate margin and thrae nerved. The fruit is ovate, about J inch by £ iuch on a solitary sta'.k 2 - 3 inches in length. The specimen is marked *Dalzell,* Bombay, and the plant probably grows in the bed of a river.

2. *Lagenandra.*

L. toxicaria, *Dazl.*, F.B.I.—VI-495. *Vutsunab.* Konkan, Belgaura. *Dalzell.* (Cocssi, N. Kanara. *Tallot.* March.)

3. *Pittia.*

P. Stratiotes, *Linn.*, F.B.I.—VI-497. Poona, widely. JulyNov-

4. *Ariseama.*

A. tortuosum, *Schott,* F.B.I.— VI-502. Panchgani. «Tuly.
A. Leschenaultii, *Bl,* F.B.I.—V1-504. Western Ghats.
A. Murrayi, *Hook,* F.B.I.—VI-508. Shinvaghad. July-Sept.

A. caudatum, *JEngler.*, F.B.I.—Vl-508. Konkan. *Stocks.*

5. *Sauromatum.*

S. guttatyim, *Schott.*, F.B.I.—VL508. *tfurki.* Mawal. April.

7. *Typhonium.*

T. bulbiferum, *Date.*, P.B.I.—VI-511. S> Konkon. *Stocks.*

8. *Theriphonum.*

T. Dalzelli, *Schott,* F.B.I.—VI-513. Kalyan. Konkan. Karwar. Au/-

9. *Amorp\ophallus.*

A. campanulatus, *Bl.*, F.B.I.—VI-513. *Suran.* Cult-
A. bulbifer.Br, F.B.I-V1-515. Londa. In flower April. (In.leaf June-July.)
A. commutatus, *Er.gler,* F.B.I.—VI-515. *Shewla. Sooringudell.* Marmagao. (Shewdi, nr. Bombay. Aup.-Sept.)

S, sylaticus, *Schott.*, F.B.I.—VI-518. 10. *Synantherias.* Marnaagoa. May.

A. peltata, *Nimmo.*, F.B.I.^VI-519. 13. *Ariopsls.* Narel. Sept

R. vivipara, *Schott.*, F.B.I.—VI 521. 16. *Remusatia.* Lanoli. Juiy-Ang.

C. Antiquorum, *Schott.*, F.B.I.—VI-523. 18. *Colocasia.* Gardens.

19. *Alooasia.*

A. indica, *Schott.*, F.B.I.—Vl-426. Gardens.
A. macrorrhiza, *Schott.*, F.B.I.—VI-526. Gardens.
A. portia, *N.J£.B.* Gardens.

25. *Raphidophora.*

R. ptrtusa, *Schott.*, F.B.I.—VI-546. Gardens.

31. *Pottos.*

P. scaudene, *Linn.*, F.B.I.—V1-55 h Kadgul, N. Eanara. Nov.

32. *Acorus.*

A. Calamus, Ziw»., F.B.i.-VI-555. *Vehland.* Gardens.

CLXVII.—LEMNACEiE.

J* gibba, Z*«»., F.B.I.-VI-656. *Nil.* 1. *Lemna.* Boshri, nr. Poona. Sept.
li- poljrrhiza, *Linn.*, F.B I.—V 1-557. Poona. Sept.

W. arrhiza, TFmw., F.B.I.—VI-557. *2 Wolffia.* Tanks, Konkan. Deccan.

CLX1X.—ALISMACBJE.

1. *Alisma.*

There is a ^oo;i specimen of *A. renforme*, Don., in Daizell's Bombay Herbarium at Kew, without locality. Its occurrence in Western Iudia as an indigenous plant is questionable.

2. *Limwphyton.*

!*• obtusifolium, *Mig* , F.B.I.—VI-560. *Nulkoot**. Ankleshwar. Guz?rat. Feb.

3. *iSagiuaria.*

S. sagittifolia, *Linn.*, F.B.I.—VI-561. Halwan. Sept.

4. *Wisneria.*

W. triandra, *Mich* , F.B.I.—VI-562. Hal wan, *DalzelL* Aug.

6. *Butomopsis.*

B. lanceolata, *Kunth.*, F.B.I.—V1-562. Godra. Nov.

CLXIL—NAIADACEE.

2. *Aponogeton.*

A. monostachyon, *Linn.*, F.B.I.—VI-564,. Godra. Samasgi, Dharwir. July-Dec.

3. *Potamogeton.*

P. indicua, *Roxb.*, F B.I.—VI-566. Poona. Deo,
P. perfoliatus, *Linn.*, F.B.I.—VI-566. Poona. Dec.
P. criapus, *Linn.*, F.B.I.—VI-566. Poona.
P. pectinatus, *Linn.*, F.B.J.—VI-566. Poona. Si ad. Aug.

K. rostellafca, *Koch.*, F.B.I.—VI«568.

4. *Buppia.*

Mahim. Dec.

Z. palastris, *Linn.*, P.B I.—VL568.

5. *Zannichellia.*

Moola River, Poona. March.

N. minor, All JF. *Fed em.*

6. *Xaias.*

Poona. March.

CLXXI.—EBIOCAULES;.

1. *Eriocauhn.*

The following list is compiled from specimens at Kew :—

E. oapillus-naiadis, *Hooh.f.*, F.B.I.—VI-572.
E.odloratum, *Data.*, F.B.I.—VI-574. „ . Konlcan. Oct. Dec
E. breviscapum, *Koern.*, F.B.I.—V1-575. Konkan • widely. Kulgi. Sopa. Aug'
E. Wigbtianum, *Mart.*, F.B.I.—VI-576. Anmode, N. Kanara. *TalboL* Nov.
J5. lanceolatmn, *Mig.*, F.B.I.—VI-577. Konkan, *Dalzell.* Gdirsoppa. *Talbot.* Nov.
E. Sieboldianum, *Sieb. ty Zuoc*, F.B.I.—VI-577. Supa, N. Kana.a. *Talbot.* Nov.
E. stellulatum, *Koern.*, F.B.I. —VI-579. Karwar, *Talbot.* Sept.
E. sexangulare, *L.*, F.B.I.—VI-580. __ , Konkan. *Storks.*
E. minutum, *Hook.f.*, F.B.I.—VI-579. Konkan & Western Ghats. Sept-
E. Lalzellii, *Koern.*, F.B I.—VI-580. _ Konkan, *Mr. Lav).*
E. cuapidatum, *Bait.*, F.B.I.—VI-581. Konkan, *Stocks.* Oct. Dec.
E. lazulifolium, *Mart.*, F.B.I.—VI-582. Siddapore, *Talbot.* Nov.
E. trilobum, *Ham.*, F.B.I.—VI-583. Konkan, *Stocks.*
E. xeranthemnm, *Mart.*, F B.I.—YI-584. Konkan. *Storks**
Karwar, *Talbot.* Sept.

CLXXII. CTPEBACEJ:.

1. *KyMngia.*

K. triceps, *Bottb.*, F.B.I.— VI-587.
K, monocephala, *Bottb.*, F.B.I.—VI-589. Poona. Sept.

2 *Pycreus.*

P. latispicatuB, *C.B.C.*, *i* B.I.—VI-590.
P. malabarious, *C.B.C.*, Linn. Soc. Jour. XXXIV-12. Mawal. Poona. Sept.
P. sanguinolentus, *Nees* , F.B.I.—VI-590. Khandala. Lanoli. Sept.
P. Ditens, *Nees.*, F.B.I.—Vl-591. -- Khandala. Sept.
P. pumilus, *Nees.*, F.B.I.—VI *591. Kanara. Lanoli. Mawal. Sept.
P. globosus, *Beichb.*, F.B.I. -- VI-591. Sion. Bombay. Sept.
P. globoflus, var. Nilagirica, *C.B.C.* Poona. Nov. Jan
P. „ „ striota.
P. polystacliyns, *Beawo.*% P.B.I.—VI-592.
P. Baocha, *Nees.*, F.B.I.—VI-593. Malwan. Surat. Dec.
P. albomargiuatus, *Nees.*, F.B.I.—VI-594.
Londa. Sept.

3. *Juncellus.*

J. alopecuroides, *C.B.C*, F.B.I.^VI-598.
J. pyginsena, *C.B.C*, P.B.I.—VI-596. Jalodh. Panch Mahals, Deccan. Sind. Dec.
J. lavigatus, *C.B.C*, F.B.I.—VI-596. JT ,i . , o. _ Surat. Poon». Oct.
Kathiawad. Smd. Bombay. Salt marshes. Oct.

4. Cyperus.

C. cephalotus, *Vahl.* F.B.I.—VI 597.
C. castanens, *Willi.*, F.B.I.—VI-589. Bombay. Oct.-Dec.
C. cuspidatus, *E. and K.*% P.B.I.—VI-598. Lanoli.
C. difformia, *Linn.*, F.B.I.—VI-599. Khandala. Chinchwad. Oct.-Ja"«
C. baspan, *Linn.*, F.B.I.—VI-600. Rutuagiri. Lanoli. Oct.- Dec*
C. teneriffse, *Poiret*, F.B.I.—VI-601. Poona. Sept.
C. nivens, Ke t. F.B.I.—VI-601. Hyderabad. Sind. Nov.
C. leucocephalu», *BeU.*, F.B.I. -- VI-602. Konkrtn. *Mr. Law.*
C. arenarius, *Betz.*, F.B.I.—VI-6C2. Karwar. *Talbot.* Karachi. Ahmedabad. Domus. Nov.
C. conglomeratus, *BeU.*, F.B.I —V1-602. Sibi. *Lace.* Ahmecabad. N«>v.-Peb.
C. paohyrihizus, *Boecx.*, F.B.I.,~ VI-603. Porebander. Verawal. Nov.-Dec.
C. Atkinsoni, *C.B.C*, F.B.I.- VI-603. Jamadar. Kallanda near Karachi.
C. compressns, *Linn.*, F.B.I.—VI-605. Poona. *Stocks.* Sept.
C. arisiatus, *Bottb.*, P.B.I.—VI-606. Poooa. Sept.
C. Iria, *Linn.*, F.B.I.—V1-606. Khandala. Uec.
C. Iria, *Linn.*, var. paniciformis, F.B.I.—VI-606. Khandala. Sept.
C. natans, *Vahl.*. F.B.I.- VI-607. Khandala. Sept.
C. eleuainoiies, *Kunth* , F.B.I.—VI 608. Mawal. Sept.
C. malaccensis, *Lam.*, F.B.I.—VI-608. Goa. Sind. Kalyan, Dec.
C. procerus, *Bottb.*, F B.I,—VI-61O. Goa. Ucc.
O. bulbosus, *Vahl.*, F.B.I.-VI-612. Hyderabad. Sind. Dec.
C. tegetiformis, *Bxb* , F.B.I.—VI-612. Kalyan. Sept.
C. corymboBu?", *Bottb.*, F.B.I.—VI-612. K»1\AH Sept.
C. tegetum, *Boxb.*, F.B.I.—VI '513. Konkan. *Mr. Law.* L:inoli. Sept.
C. rotnndus, *Linn.*, p B.I.—VI»614. Poona. Lanoli. Bhubak. Sind. S«>pt.
C. tuberosus, *Bottb.*, F.B.I.—VI-616. Poona. Tliana. Sept.

C. esculentus, *Linn.*, F.B.I.—VI-616. Po^na. *Jacquetnont.*
C. exultatus, *Retz*, F.B I.—VI-617. Kurjar. Lanoli. Scj·t.
C. digitatus, *ROTO.*, P.B.I.—VI-618. Lanoli. 1'oona. Sept.
C. Papyrus, ZMI»., Sp. PI. 47. Gard. Chron. 1875. 78. Gardens. Sept.
C. alteinifolius, *Linn.*, Mant. 28. Flor de serre. 1861. 233. Gardens.

5. *Mariscus.*

M. bulbosus, *C.B.C.*, F.B.I.—VI-619. Badami. Dharwar. Oct.
M. paniceus, *Vahl.*, F.B.I.—V1-620. Konkan. *Mr. Law.*
M. Sieberianus, *Nees.*, F.B,I.—VI-622. Western Ghats. Oct.
»U albescens, *Gand.*, F.B.I.—VI-624. Mbad. Konkau. Oct.

6. *Courtoisia.*

C. cyperoides, *flees.*, F.B.I.-VL 625.

7. *Eleocharis.*

E. plantaginea, *Br.*, F.B.I.—VI-625. Baroda. Sept.
£. fistnlosa, *Link.*, F.B.I.—VI-626.
E. spiralis, *Br*, F.B.I.—VI-627. Goa. Dec. Salsette. *Jacquemont.*
E. atiopurpurea, *Kunth.*, F.B.I.—VI-627. Godhra. Sept.
&. capitata, JB/-., F.B.I.—VI-627. Poona. Sind. *Stocks.* Sept.
E. paluetiis, 5f., F.B.I.—YI-628$^{7}/_{8}$. Hydeiabad. Sind. Dee.
E. chaetaria, *Rcem Sc Seh.*, F.B.I. — VI-629. Londa. Dharwar. Dec.,

8. *Fimhristylis.*

F. tetragona, *Br.*, F.B.I.— VI-631. Hiidosi. Mawal. Oct.
F. polytrioboidea, *Vahl.*, F.B.I.—Vl-632. Sion, Bombay. Oct.
F. schoenoides, *Vahl.* F.B.I.—VI-634. Konkan. Sept.
F. dichotoma, *Vahl.*, F.B.I.—VI-635. Bodeli. Guzerat. Khandala. Oct.-Apl.
F. diphylla, *Vah/.*, F.B.I.—VI-636. Shelarwadi, Konkan. Aug.
F. aestivalis, *Vahl.*, F.B.I.—VI-637. Mawai. Matheran. Sept. Dec.
F. ferruginea, *Vahl.*, F.B.I.—VI-638. Poona. Hyderabad, Sind. Khandaia. Sept.-Oct.
F.-spatbacea, *Roth.*, I., F.B.I.—VI-640. Karachi. Dec.
F. monticola, *Steud.*, F.B.I.—VI-642. Sholarwadi. Poora. Aug.
F. q^nquangularis, *Kunth.*, F.B.I.—VI-644. Baroda. Sept
F. miliaceffi, Fa^.,F.B.i.—VI-644. Kalyan. Sept.
F. «omplanata, *Link.*, F.B.I.—V1-646.
F. _ » var. mioiocarpa. Hewra, Poona. *Dalzell.*
F. Woodrowi, *C.B. Clark*, Ex. Jour. Linn. Soc. XXXIV. 68. Kbandala. Malwan. Oct.
F. junciformis, *Kunth.*, F.B.I.—V1-647. Karli. Nov.
F. digitata, *Boech.*, F.B.I.—VI-648. Poona. Marmagoa. *Talhot.* Lanoli. Bilckerry, N. Kauara. Jet.
F. monostachya, *Ma&sk.*, F.B.I.—VI-649. Badami. Poona. *Jacquemont.* July.

9. *Bulbostylis.*

B- barbata, *Dalz.*, F.B.I.—VI-651. Badami. July.

10. *Seirpus.*

supinns, *Law*, F.B.I.—VI-655. Bansda. Kalyan. Sind. Oct-Peb.
S. articulatus, *Linn.*, F.B.I.—VI-656. Konkan. Sind. O:-t.-Feb.
S. quinqueEarius, *Beech.*, F.B.I.—VI-657. Bbubak, Sind. Umiat, Guzerat. Nov.-Dec.
S. corymbosuB, *Heyne.*, F.B.I.—VI-657. Goa. Sind. Dec.
S. maritimus, *Linn.*, F.B.I.—VI-658. Miraj. Karachi. Bombay. Nov.
». littoralis, *Schrad.*, F.B.I.—VI-659. Si»d. *Dalzell.*
S. grossus, *Linn.*, F.B.I.—Vl-659. Kalyan. Sept.
5* .» var., *Kysoor, C.B.C.*, F.B.I.—VI-660. *Kachara*, Bombay, cult. Sept.
S" MWioides, *Boech*, F.B.I.—Vl-662.
S. Michelianuu, *Linn.*, FB I— VI-662. *Fa\ee.* Konkan. Sind. Bhubak. Oct.
o- sqearrosus, *Linn.*, F.B.I.—VI-663. Widely. Oot.-Dec.

11. *Eriophoium.*

E. oomoBum, *Wall.*, F.B.I.—VI-664. Junir. Champaner. Oct.

12. *Fuirena.*

F. Wallichiana, *Kunth.*, F.B.I.—VI-665. Poona. Sept.
*• glomerata. *tarn* , F B.I.—VI-666, Godnra. Sawantwadi. Nov.
g· unoin»ta, *Kunth.*, F.B.I.—VI-666. Kanara. *Dr. Thomson.* Dec.
*· n[illegible] *Rottb.*, F.B.I.—VI-666. Louda. Aiandi. Nov.

14. *Rhynchospora.*

R. Wallichiana, *Kvnth.*, F.B.I.-VI-668. Aug.
R. Wightiana, C.J5.C, F.B.I.-VI-669, Poona. Khandala. Aug.
R. aurea, FaA^., F.B.I.-VI-67O. Southern Maratha Country. *Young.*

20. *Bemirea.*

B-matitim., *Aubl.*, P.B.i.-YI-677. Seashoe, Kanara. flr.2J.wM.

21. *Hypolytrim.*

H. Wightianum, *BoecTc.*, P.B.I.—VI-6^8. *Bhimlo.* Castle Rock. Katgul. N. Kanara. Feb.

26. *Seleria.*

S. lithosperma, *Swartz.*, F.B.I.—VI-685. Matheran. Pec.
S. biflora; *Roxb* , F.B.I.—Vi-687. Matheran. Dec.
S. tasselata, *Wit Id.*, F.B.I.—VI-687. Between Poona and Pannaola. (Panwel). *Jacquemont.*
S. Stacksiana, *Boeck.*, F.B.I.- VI-687. Talegaon. Bombay. Dec.
S. annularis, *Kunth.*, F.B.I.—VI-687. Konkau. *Mr. Law.*
S. hebecarpa, *Nees.*, F.B.I. -VI-6S9. N. Kanara. *Talbot.*

28. *Carex.*

C. mercarensis., *Steud.*, F.B.I.—VI-719. Mahableshwar. Londa. Hulgi. N. Canara. *Talbot.* Oct.
0. speciosa, *Kunth.*, F.B.I.—VI-729. Hulgi. N. Kanara. *Talbot.* Oct.

CLXXIII. GRAMINEJS.

1. *Paspalum.*

P. scrobioulatum, *Linn.*, F B.I.—VII. *H.arika*%
P. compactum, *Roth.*, F.B.I.—VII-12. *Kuri.* Cnlt. widely. Oct.
P. dibtichum, *Linn.*, F.B.I.— VI1-12. Kanara. Mahableshwar. Lanoli. Sept..
P. tangninale, *Lamk* , F.B.I.—VI1-13. Seashore, Bombay. Mai wan. Oct.
P. pennatuin, *Hook.f,* F.B.I.— VII-16, *Roega. Dinohi.* Sind. Panel. Oct.
P. teniatiuu, *Hook,f.*, F.B.I.—VII.-17. Karachi. *Stocks.* Morvi. *J. Beck.* Oct.
P. lougittoruui, *Ret*.*, F.B.I.—V1I-17. Belgaum. *Ritchie.*
P. Boylt-anuin, *Nees,* F.u.i.—V1I-18.
P. p.-dicellare, *Trin. ex. Steud.*, F.B.I.—VII-19, Suwasni Ghat. Deo, Konkan. *Stocks.*

2. *Eriochloa.*

E. polystachya, *H. B. SfK.*, F.B.I.—VI1-20. Mahiin, Bombay. Oct.

3 *Isachne.*

I. Lisboae, *Hook, f., Bombay Grasses, Lisboa,* 6. Mahableshwar. Oct.
1. elegans, *DJUIZ* , F.B.I.—VII-23. Lanoli. Poona. Sept.
I. australis, *Br.*, F.B.I.—Vll-24. Mahableshwar. Oct.
I. lniliacea, *Roth.*, b.B.i.—VII-25. Koukan. Oct.

4. *Pant cum.*

P. Isachne, *Roth.*, F.B.I.—VII-28. Poona. Sept.-Jan.
P. flaviduin, *Retz.*, F.B.I.—VII-28. Jvnanaala. Morvi. Porbunder. Oct.
P. punctatum, *Burnt.*, F.B.I.—VII-29. Alimednagar. Poona. Nov.
P. paspaloides, *Pers.*, F B.I.-VII-29. Munchar Lake. Sind. *Stocks.*
P. crusgalli, *Linn* , F B.I.—VI I-30. Poona. Bombay. Morvi. Oct.
P. „ var. frumentaceuiD. Sind. *Pakur.* Londa. Morvi. Shikarpur. Oct.
P. colonum, *Linn.*, F.B.I.—VII-32. *Savri.* *Pool.* Sind. *Chimanchara.* Poona. Kathiawad. Sept.
P. proatratum, *Lamk.*, F.B.I. -VII-33. *Water Grass of Mauritius.* Cult. Kirkee. Snrat.
P. inuticum, *For^k.*, F.B.I.—VII-35. *Phadya. Gonalya.* K Khaudesh. Poona. Badami. Aug.-Nov.
P. javanicum, *Poir.*, F.B.I.—VII-35. Poona. Badami. Aug.-Nov.
P. ramoium, *Linn., F.B.I.*— VIi-36. Poona. Rajkot. Sept.-Dec,
P. setigerum, *Retz.*, F.B.I.—VII-37.
P. auritum, *Presl.*, F.B.I.—Vll-40. Sind. Panwel. Vengurla. Oot.-Feb.
P. iuterruptum, *Willd.*, F.B.I.-Vll-40.
P. indicum, *Linn.*, F.B.I.— V1I-41.
P. myosuroides, *Br.*, F.B.I.—VII-42. Sawantwadi. Nov.
P. ncdosum, *Kunth.*, F.B.I.—Vll-43.
P. turgidum, *Forsk.*, F.B.I.—VI1-44. Rajkot. Deesa. Nov.
P. iniliaceum, *Linn.*, F.B.I.—VI1-45. *Vari.* Cult.
P. miliare, *Lamk.*, F.B.I.--VII-46. Cult.
P. psilopodium, *Trin.*, F.B.I.—VII-46. Kalyan. Parel. Sept.
P. trypheron, *Schult.*, F.B.I.—VII-47. *Bhatur.* Jeur. Sholapur. Mulhargad. Poona. Sept.
P. maximum, *Jacq.*, F.B.I.—VII-49. *Guinea Grass.* Cult-
P. proliferum, *Lann.*, F.B.I.—VI1-50. Jeur. Sholapur Dist. Dec.
P. obscurans, *Stapf. Tan Sawa. Bhatur.* Badami. Sept.
P. subegluine, *Trin.*, F.B.I.—V11-557. Kathiawad. Sukar. Sind. Londa. Mar.
P. antidotale, *Retz.*, F.B.I.— Vll-62. Bansda. Dang. Ja».
P. uiontauum, *Roxb.*, F.B.I. -V11-53. *Tokarbund.* Cult. Nov.
P. plicatum, *Lamk.*, F.B.I.—VII-55. Londr, " OE a tree." *G. A. Gammie.* Oct.
P. rhachitriohum, *Hochst.*, F.B.I.—VI1-56.
P. trigonum, *Retz.*, F.B.I.—VH-56.
P. patens. *Linn.*, F.B.I.—VII-57. Kadgul. N. Kanara. Deo.

6. *Thysanolana.*

T. agrostis, *Nees.*, F.B.I.—VII-61. Dang. Bansda. Feb.

7. *Chamceraphis.*

C. spinescens, *Poir.*, FSB.I.- VII-62. Wangui. Koukan. Sept.

8. *Spinifex.*

S. squarrosus, *Linn.*, F.B.I.—VII-63. Kumta. Sbriwardban. Nov.

9. *Axonopus.*

A, cimicinns, *Beauv.*, F.B.I.—VII-64 Badami. Dharwar. Oct.

10. *Tricholoena.*

T. Teneriffge, *Parlat,* F.B.I.—VI1-65. TbaTio Bnlo Khsin. Sind. Au<?.
T. Wightii, *Nees.*, F,B.I—VII-65. *Chota Kagli.* Mulhargad. Poona. Sjpt.

11. *Oplismenus.*

O. compositus, *Beauv.*. F.B.I.—VII-66. Kadgal. Mat^ernn. Nov.-Dec.
U. Burmannii, *Beauv.*, F.B.I—VII-68. Parichgani. Purel. Oct.-Sept

12. *Arundlntlla.*

A. avenacea, *Munro,* F.B.I.—VII-C9. Ratnapiri. Castle Rock. Oct.
A. tnberoulata, *Munro.*, F.B.I.—VII-69. Poona. Oct.
A. setosa, *Trin.*, F.B.I.-VII-70. Near Bombay. *Ritchie.*
A. agiosoides, *Trin.*, F.B.I—V1I-71.
A tenella, *Nees.*, F.B.I.— VII -71. Lanoli. Mabnbleswar. Nov.
A. pygmea, *Hook.f.,* F.B.I.—VI1-72. Crest of W. Ghats. Sept.
A. metzii, *Sochst.*, F.B.I.—VII-7a. Lar.oli. Oct.
A. brasiliensis, *Raddi* , F B.I,—VII-73- Panchgani. Ra'ljouri. Oct. Near Poona. *Jacquemont.*
A. capillari9, *Hook.f,* F B.I.—VII-74. *Kotir.* Parel. Kalanuddee. Oct.
A. fuscata, *Nees.*, F.B.I.—VI1-7-1.
A. gigantea, *Da/z.*, F B.I.—VII 76. Caatle Rock. Konkan. Oct.
A. spicata, *JDalz.*, Bombay Flora, 293. Mabableshwar. Nov.
A. Lawii, *Hook.f.*, Ceylon Flora.

13. *Setaria.*

S. itelica, *Beauv.*, F.B I.—VII-78. *Rala.* Cu'-t. widely.
S. glauoa, *Beauv.*, F.B.I.—VII-79. *Kolara. Kolada.* Mabnbleshwar. Opt.
S. intermedia, *Roem. and Sch.%* F B.I.—VII-79. *Pander.* Konkan. *Mr. Law.* Poona. Belgaum. *Ritclijp.* Aug.-Oct.
S. vertioillata, *Beauv.*, F.B.I.—VI1-80. *Pandar. Dungunee.* Baroda. Morvi. Dec.

14. *Pennisetum**

P. typboideum, *Rich.*, F.B.I.—VII-82. *Bajri.* Cult.
P. alopecuros, ^ewo?, F B.I.—VI1-84. *Mold.* Poona. Belgaum. Sind. Oot.
P. dichotomum, *Detile,* F B I.— VH-85. Sind. *Stocks.*
P. oriental©, .RicA., F B.I.—VII-86 Abu, *Sir O. King.* July.
P. Pedjcellatum, 2W»., F.B I.— VI,-86. Kajkot. Oot.
P. setosum, *Rich* , F.B.I.—VII-87. Hyderabad. Sind. Dec.
P. ce"cbroides, *Ribh.*, F.B.I.—VII-&8. Rajkot. Near Karachi. Dec.

15. *Cenchrus.*

C. bifloms, *Roxb.*, F.B.I.—VII-89. Karachi. Morvi, *J Beck* Dec.

18. *Oryza.*

O. sativa, *Linn.*, F.B.I.—VIT-92. *Nawar. Bhat.* Cult, widely.
O. <>arotat», *Roa>b.*, F.B.I.—VII-03.

19. *Leersia.*

L. hexandra, *Sw.*, F.B.I.—VII-94. Londa, *G. A. Gammie.* Oct.

20. *Hygrorhiza-*

H. ftristata, *Nees,* F.B.I..-VII-95. *Devabhata.* Chickhle, Guzerat. April.

22. *Trachys.*

T. mucronata, P w . , F.B.I.—VII-96. Badaini. Dharwar. Aug.

23. *Tragus.*

T. raoemosus, *8copu* F.B I.—VII-97. Badanr, Bijapur. Rajkot. Poona *Jacquemont.* Sind. *Stocks.* Sept

24 *Latipes.*

L. senegalensis, *Kuntk.*, F.B I.—VII-97. 20 miles N. of Karaobi. .fug,

26- *Perotis.*

P. latifolia, *Ai#.*, F.B.I.—VII-98. *Kuras.* Badami. Maiwan. Oct.-Aug.

27. *Zoysia.*

Z. pungens, *Willd.*, F.B.I.—VII-99. Damaun, *Lisboa.*

28. *Coix.*

C. Lachryma Jobs Z»»».f F.B.I.—VIM00. *Ran-jondhala. Kaseda.* Lanoli. Oct.

29. *Polytoca.*

P. Cookii, *Stapf.*, F.B.I.—VII-101. *Kurisal.* Mahableshwar. Sept.
P. barbata, *Stapf.*, F.B.I.—VII-102. *Kant a. Rarwel.* Poona. Sept.

29. *Zea.*

Z. Mays, *Linn.*, F.B.I.—VII-102. *Maka, Maize.* Cult.

30. *Dimeria.*

D. ornithopoda, *Trin.*, F.B.I.—VII-104. *Khap Kurdi.* Khandala. Panchgani. Oct.
D. Woodrowii, *Stapf.*, F.B.I.—VII-104. Ratnatriri. Oot.
D. gracilis, *Nees*, F.B I.—VI1-105. Lanoli. Dec

31. *Imperata.*

I. arundinacea, *Cyrill.*, F.B.I.—VII-106. Londa. Sind. *Stocks.* Aug.

33. *Spodiopogon.*

S. albidus, *Benth.*, F.B.I.—VII-103. Khandala. Salsette. Oot.

34. *Poilinia.*

P. argentea, *Trin.*, F.B.I.—VII-113. Lanoli. Ratnagiri. Oct.-Dec.
P. fimbriata, *Hack.*, F B.I.—VII-112. Lanoli. Oct.

35. *Saccharum.*

S. officinarum, *Linn* , F.B I.—VII-118. *Vs. lisa Qundertu* Cult.
S. spontanum, *Linn.*, F.B.I. —VII-118 *Bagberi. Kamis. Khair.* Poona. Kanat. Shikarpur. Nov.
S. arundinaceuin, *Retz.*, F.B I.—VII-119. Planted.
S *iuscum, Roxb.*, F.B.I.—VII-120.

36. *Erianthus.*

E. ravennaB, *Beauv.*, F.B.I.—VII-121. Karachi. Dec.
E. fastigiatus, *Nees*, F.B.I.—VI1-125. Belgaum. *Ritchie.*

37. *Ischcemum.*

I. aristatum, *Linn.*, F.B.I.—VII 126. *Bherdi. Quz.* Salsette. Konkan. Balgaum, *Ritchie.* Oct.-Dec.
I. rugosum, *Salisb.*, F.B.I.—VJI-127. Poona. Oct.
I. molle, *Hook, f.*, F.B.I.—V^ 126. Lanoli. Oct.-Dec.
I. diplopogon, *Hook.*, F.B.I.—129. Bokus nr. Poona. Matheran. Mahableshwar. Oct.-Dec.
I. angustifolinm, *Hack.*, F.B.I. — VII-129. *Sabai.* Hajkot. Cult, at Poona. Dec.-Feb.
I. pilosum, *Had.*, F.B.I.—VII-130. *Koonda. Nnth.* Widely in black soil. Oct.-Mar.
I. semisagittatum, *Roxb.*, F.B I.—VII-139. Yellapore. Parel. Lanoli. Sept.-Oct
I. conjugatum, *Roxb.*, F.B.I.—VI1-131. Divimana. Konkan. Deo.
I. Lisbose, *Hook.*, I., F.B.I.—VII-133. N. Kanara. *Lisbon-*
I. oiliare, *Retz.*, F.B.I.—VII-133. *JPutena.* Parel. Karti. N. Kanara. *Mr. Young. Oot**
I. Birdwoodii.
I. lixum, *Br.*, F.B.I.—VIL136 *Shed a. Chopda. Paunat.* Poona. Sept.
I. sulcatum, *Hack.*, F.B.I.—V1I-137. Gotud. *Mr. Young.* Oot. 30th, 18,-4.
I. spathifloiuin, *Hook, f.*, F.B.I.—"Vll-138. *Baeer. Ber.* Palasdari. Khandala. Sept.

39. *JPogonetherum.*

P. sacoharoideura, *Batuv.*, F.B.I.—VII-141. *Bamboo Grass.* Gardens, cult. Matheran ?
P. crinitum, *Trin.*, F.B.I.—Vll-141. Sumpkund ; N. Kanara. July.

40. *Apocopis.*

A. vaginatus, *Hackel* in Osterr. Bot. Zeitschr. Vol. 4, page 8. Kalyan, N. Kanara. *Talbot.*

41. *Arthraxon.*

A. lanoeolatus, *Hochst.*, F B.I.—VII-143. *Harjala. Qovindair.* Lanoli. Jamjodhhapur. Morvi. Kathiawad. Oct.
A. inermis, *Hook. /.*, F.B.I.—VII-145. *Vaguarin. Quz.* Matheran. Mahableshwar. Oct.
A. ciliaris, *Beauv*, F.B.I.—VII-145, *Vanguarin.* Chamargaon. *Guz.* Oct.
A. raicrophylluB, *Hochst*, F.B.I.—VII-147. Parel. Sept-
A. jubatus, *Hack.*, F.B.I.—VII-157. Koriacha Kila. Ambowni, Western Ghats. Oct.

42. *Thelokogon.*

T. elegans, *Roth.*, F.B.I.—VII-148. Poona. Bombay. Belgaum. Sept.

43. *Lokhopogon.*

L. tridentatus, *Hack.*, F.B I.—VIM49. Poona. Belgaum. Oct.-Dec

44. *Apluda.*

A. varia, *Hack.*, F.B.I.-VII-150. *Ghagara.* Konkan. Decoan, Guzerftt. Oct.-Dec

46. *Rottboellia.*

R. compressa, *Linn.*, F.B I.—VI1-153. *Baikah.* Sind. Godra. Shikarpur. Nov.
R. aouminata, *Hack.*, F.B I.—VII-155. Marmngoa. Malwan. Oct.
R divergens, *Hank. /.*, F.B I.—VII-155. *Marel.* Khandala, Mahableahwar. Sept.
R. Talboti, *Hook. /.*, F.B I.—VII-155. Goa, *W. A. Talbut.* Oct.

R. exaltata, *Linn, f,* F.B.I.—VIM56. *Bur sali.* Poona. Nov.
R. Clarkei, *Hack ,* 'F.B I.—VI1-156. Birchy. N. Kanara. *W. A. Talbot.* Nov.

47. *Manisuris.*

M. gi-auularis, *Linn. /.,* F B.I.—VII-159. KhandjJa. Poona. Dharwar. Oct.

48. *Ophiurus.*

O. corjmbosus, *Gaertn.,* F.B.I.—ViI-160. *Moot la.* Guzerat. Poona. Jeur. Dec.

50. *Miinun s.*

E. Royleanus, *Nee?,* F.B.I.—VII-161. Rajkot Sind.
E. biisutns, *Mwnro,* F.B I.—VII-162. *Sain.* Sind? *Stocks.*

53. *Andropogon.*

A. foveolatus, *Del,* F.B.I.—VII-168. *Ghandel.* Poona. Widely. Oct.
A pumilus, *Roxb.,* F B.I.—VII-170. *Gondwal. Baerkù* Diwas Ghat. Surat. Dec
A. compressus, *Hook. /.,* F B.I.— VI1-172. MawaL Poona. Deo.
A. Woodrowii, *Hook, /,* F.B I.—VI1-173. Khorbarsa, Mawal. Deo.
A. pertusus, *Willd ,* F B.I.—VI 1-^73. Lanoli. Sept.
A. concanensis, *Hook. /.,* F B f.—VII-174. Matheran. Oct.
A. ensiformis, *Hook, f.,* F B.I.—VJ1-175. Lanoli. Sept.
A. Kuntzeanus, *Hackel.*> 7.B.I.—VII-175. var. pseudointermediata. Mawal. Koukan. Oct.
A. intermedius, *Br..* F.B.I.— VI I-175. Poona. Mawal. Dec.
A. montanua, *Roxb ,* F.b.i.—VII-176. Suvasni-Ghat. Dec.
A, odoratus, *Dna. Lisboa ,* F.B I — VII-177. MawaL. Poona. Oct.
A. micranthus, *Kunth.,* F.B I.—VIC-178.
A. assnnilis, *Steud.,* F B.I.—VII-179. Suvasni-Ghat. Deo.
A. Hngelii, *Hack.,* F.B i.—VII-]80. Poona. Belgaum. Sept.
A. filiculmis, *Hook. /.,* F.B.I — VII-181. Sirsi. Dhonshi. Poona, Nov.-Dec.
A. halepensis, *Brot.,* F B.I. - VI1-182. *Boru.* Poona. Konkan. Dang. Dec.
A. Sorghum, *Brot.,* F B I.—VII-1^3. Cult.
A. purpureo-sericus, *HocJist.,* F B.I —VII-185. N. Kanara, *Young.* Poona. Kohlapur. Nov.
A. squaiTosus, *Linn. /.,* F.B I.—VI1-186. *Wala.* The Euskus Boot Grass. Planted widely. Indigenous? Jan.
A. aciculatas, *Retz.,* F.B I.— VII-188. Karwar. Oct.
A. lancearius, *Hook.f.,* F.B.I.—VI1-190. Castle Rock. Oct.
A. nionticola, *Schult.,* F.B.I.—VI[-192. *Ajiva.* Guz. Poona. Kbandala. Kohlapur. Oct.
A. montanus, *Hook. /.,* F.B.I —VII. Dbarwar. *Talbot-*
A. Aucheri, *Boiss ,* F B I.—VII-1P5. N<*ai Karachi. *Stocks.*
A. oaricosus, *Linn.,* F.B.I.—VI1-196. Felgaum. Mawal. Poona. Dec.
A. annulatus, *Forsk.,* F B I.—VII-196. Poona. Sind. *Stocks,* Oct.
A. armatus, *Hook, /.,* F.B.I.—VII-197. Konkan. *Stocks.*
A. contortus, *Linn f,* F.B I.—V1I-199. *Kursali.* Poona. Guzerat. Nov.
A. Cookei, *Stapf,* 1V1SS., New species. Sukkar. Path a r. Lauoli. Oct. 98.
A. tritioeuF, *Br.,* F.B.I.—V1I-200. Mawal. Poona.. Dec.
A. Ritchiei, *Hook.f.,* F.B.I.—VII-201. Belgaum. Poona. M.ihableshwar. Oot.-Dec.
A. polystachyos, *Roxb.* F B I.—VI1-202. Khandaia. Nov.
A. Iwaraucusa, *Jones,* F.B.I.—VII-203. Karachi. Dec.
A. >» var Laniger. Sind. Widely. Jnly-Dec.
A. Schcenanthus, *Linn.,* F.B I.—VII-204. *Surwai.* Poona Konkan. Sept.-Deo.
A. Nardus, *Linn.*% F.B.I.—VI1-205. Probably occurs witbin our limits.

54. *Anthistiria.*

A. imberbis, *Betz.,* F.B.I.—VII-211.
A. oiliata, *Linn,* F.B.I.—VII213. *Bhatada-Bati,* Peint. Pooua. Konkan. Deccan. Sept.-Jan. Oct. Poona.

A. tremila, *Nees,* F B I—VII-214.

55. *Iseilema.*

I. Wightii, *Anders.,* F B.I.—VI1-218 Belgaum, Poona. Morvi. Kathiawad. Nov.
I. laxuin, *Hack.,* F.B.I—VII-218. Poona. Belgaum. Nov.-Dec.

58. *Pseudanthistiria.*

P. bispida, *Hook.,* F.B.I.—VII-219. *Pokalya.* Panohgani, Kaljan. Ionla. Oct.-Nov.

59. *Aristada.*

A. Aeeentionia, *Linn.,* F.B.I.—VI1-224. Poona. Jetalsar. Kathiawad. Oct.-May.
A. setacea, *Retz.,* F.B.I.—VI1-225. Eajkot.
A. Hystrix, *Linn ,* F.BI.-VII-225. Badami. Oct.
A. funiculata, *Trin.* and *Rupr ,* F.B I.—VII-226. Belgaum. Jam. Sind. Oct.
A. hjstricula, *Edqw.,* F.B.I. — VI £-227. Near Karachi. *Stocks,*
A. redacta, *Stapf.,* F.B.I —VII-227.« Dharwar, Talot. Lanoli, Junir. Oct.
A. hirtigluma, *Steud.,* F.B.I.—VII-227. Bulo Khan Sind. Aug.

63. *Heleochloa.*

H. scboenoidps, *Host*,* F.B.I.—VII-235. Bhubak. Sind. Dec.
H. dura, *Boiss.,* F.B.I.—VI1-236. Dwarka. Deo.

67. *Woodrotoia.*

W. diandra, *Stapf.,* F.B.I.—VII 241. *K%t\r.* Lancli. Sept.-Oot,

68. *Garnctia.*

G. arbornm, *Stapf %* — Crest of Ghats S. of Lanoli. Nandgaon. Sept.
G. strictn, *Brongn,,* F.B.I. —VII-243. — Narel to Kurja* roid. 9eut.
G. patens, *Stapf.* — Nandgaoii, on trees. Oct.

69. *Polypogon.*

P. monspeliensis, *Desf.*, F.B.I.—V11-245.

71. *Sporobolus.*

S. diander, *Beauv.*, F.B.I.—^ 11-24.7. — Poona. *Jacquemont..*
S.indicus, *Br.*, F.B.I.—VII-217. — Kolhapur. Oct.
S. minutiflorus, *Link.*, F.B.I.—VTI-243. — Parel. Oct.
S. ioclados, *Nees*, F.B.I.—VI1-249. — Sind. *Stocks.*
S. glancifolius, *Rochst.*, F B.I.—VII-250. — Porebander. Karachi. Nov.
S. sindious, *Stapf.*, Kew Bull. — 20 miles from Karachi. Nov.
S. ovientahs, *Kunth.*, F.B.I.—VI1-251. — Umrat. Guz. salt land. Nov.
S. piliferus, *Kunth.*, F.B.I.—VII-251. — Bclzaum. *Ritchie-*
S. arabicus, *Boiss.*$_5$ F.B.I.—VII-252. — Kaiachi.
S. coroinandelianus, *Kunth.*, F.B.I.—YII-252. — Sind. Nagpar Dist. Ja".

79. *Tristae7it/a.*

T. barbata, *Nees*, F.B.I.—VII-272. — Sind. *Stocks.*

82. *Avena.*

A. sativa, *Linn.*, F.B.I.—VI1-275. — Cult. Hydeiabad. Sind.

84. *Micruchloa.*

LI. setacea, *Br.*, F.B.I.—VII-283. — Dharwar. Aug.

85. *Gracilea.*

G. Royleana, *Hooh.f.*, F.B.I.—VII-284. — Konkan. Sind.

87. *Tripogon.*

T. oapiilatua, *Jaub.* and *Spach.* F.B.^{T}.—VII-285. — On trees, Matheran. Sept.
T. pauperculus, *Stapf.*, F.B.I.—VII-285. — Ou rookd near Karli. Sept-
T. Lisbse, *Stapf.*, F.B.I.—VII-286. *Chiraaa.* — Matheran. Oct.
T. Jacqueinoutii, *Stapf.*, F.B.I.—VII-287. — Poona. Matheran. Sept.

88. *Cynodon**

C. daotylon, *Pers.*, F.B.I.—VII-288. *Heraili.* *Durva** — Throughout India.

89. *Cidoris.*

C incompleta, *Both.*, F.B.I.—VII-290. — ˙N. Kanara. Feb.
C. tenella, *Roxb.*, F.B.I.—VII-290. — Surat. Bijapur, in shade only. Oct.
C- villosa, *Pers.*, F.B.I.—VII-291. — Sind S *oaks-*
C- barbata, *Sw.*, F.B.i.—VII-2d2. *Gondwail.* — Siud. Decean. Widely. Nov.

90. *Eteusine.*

E. indica, *Gaertto.*, P.B I.—VII-293. — *Mahar*nachani.* Poona. J»^{n}«
E. flrtgellifera, *Nees*, F.B.I.—VII-294. — Sind. *Stock**
E. vertioillata, *Roxb.*, F.B.I.—VII-295.
E. segyptiaca, *Desf*, F.B.I.—VI1-295. — Butnagiri. Badaini. Saharanpoor Disfc. Sept.-Nov.
E. aristata, *JEhrenb.*, F.B.I.—V11-296. — Rutna^iri. Ahmedabad.

91. *Dinebra.*

D. arabica, *Jacq.*, F.B.I.—VII-297. — Poona Morvi. Surat. Au£.

92. *Leptochloa.*

L. chineneis, *Sees*, F.B.I.—VII-299. — Dr. Lisboa records fhaf he has seen specimens from Parel, and fi'»m Guzerat. There are no speoimens from Western India in tto Herbarium at Poona or at Kew.

95. *Pappaphorum.*

P. elcgana, *Nees*, F.B.I.—VII-301. — Khajuri. Karachi Dist. Aug.

96. *Arundo**

A. Donax, *Linn.* — Gardens.

97. *Phragthites.*

P. communis, *Trin.*, F.B.I.—VII-303. — *Gardener's garter.* Variegated form. Gardens.
P. Karka, *Trin.*, F.B I.—VI1-304. — Dhon, *Lisboa.*

99. *Elitrophorus.*

E. arthuiatus, *Beauv.*> F.B.I.—VII-305. *Jungli Bala.* Kalyan, Lcnda. Godhra. Nov.-Feb.

104. *Eragrostis,*

E. aspera, *Nees,* F.B.I.—VII-314. N. Kanara. *Lishoa.*
E. ciliaris, *Link.,* F.B I.—VII-314. Baroda. Nov.
K. tenella, *Roem. 6c Sch.,* F.B I.—VII-315. *Woya. Buchraloo.* Sind. Sarat. Poona. Nov.
E. interrupta, *Beauv.,* F.B.I.—VI1-316. Surat. Bhowden, near Poona. Nov.
E. amabilis, *Wgt. & Am.,* F.B.I.—V1I-317. Parel. Basisein. Poona. Sept.-Nov.
•E. interrupta, var. Koenigii, *Stapf.,* F.B I . - VII-316.
E. stenopbylla, *Hochst.,* F.B.T.—VII-318. Bhorfcus. Mawal. DPO.
E. elegantula, *8teud.,* F.B.I.—VI1-398. BhoTkus. Mawnl. Dec.-Apr.
i£. tiemula, *Hochst.,* F.B.I.— VII-320. Guzerat. Deesa. Palanpur. Nov.
E. major, *Host.,* F.B.r.—VI1-320. Siud Poona. Morvi. Nov.-Jan.
E. ruinor, *Host.,* F.B.I.—VII-321. Godbra. Panohmahals. Nov.
E. tenuifolia, *Hoekst.,* F.B.I.—VI1-322. Beigaum.
E. pilose, *Beauv* , F.B.I.—VI1-323. Sind. Dharwar. Waghoti, Poona. Sept.-Oci.
h. ex nosuroides, *Beauv.,* F.B.I.—VII-324. *Darbha. Kusha.* Mandvi. Hyderabad. Sind. Dec.
E. bifaiia, *Wgt.,j.B.L.*~VII-325. Belgaum. *Ritchie.* Khandala. Aug.

106. *Malopyrum.*

H. micronatnm, *Stapf.,* F.B.I.—VI1-328. Porebui.der. Sind. *Stocks. Nov.*

108. *DiplacKne.*

D. fusca, *Beauv.,* F.B.I.—VII-329. Rice fields, Matunga near Bombay, Nov.

111. *Centotheca.*

C lappacea, *Desv.* F.B.I.—V11-332. ivadgal, Kanara Dist. Oct.

113. *Mluropus.*

-®. villosus, *Trin.,* F.B.I.—VI1-334. Umrat. Guz. Karachi. Nov.-Dec.

127. *Oropetium,*

O.Thomeaum, *Trin.,* F.B.I.—VI1366. Junir. Poona. July-Sept.

121. *Triticum.*

T. Speltum, var. *Khapli. Jod. Pumban.* Covered grain wheat. Cult, widely.
T. Vuljjare, *VilL*$_y$ F.B.I.—VII-367. *Gkui.* Cult, widely.
A. pilosum, *Dalz & Gibs. Bakshi. Kola. Kusali. Kanno.* Cult, widely.
*' monococcum, *Linn.* Guzerat.

ISO. *Hordeum.*

H. vulgare, var. Hexastichon, *Linn.,* F.B.I.—VI1-&71. *Satu Jau.* Cult, widely.
fi* »» var. distichon *Jau.* Sind, cult.
„ var. nuduno, *Ua. Ufan.* Naked or loose grained Barley. Guzerat. Sind.

Bambusa

** nauaf R_O*xb.*% F.B.I.-VI1-390. *Barik. Bamboo** Jap. Bamboo. Gardens.
** vulgaris, *Schrad.,* F.B.I.—VII-S91. *Oodha. Bans.* Planted.
5" »» var. straita, *Bot. IWag.* ^079. Gold and green striped Bamboo. Gardens.
«• arundinacea, TPt^c7f F.B.I.—VII-395. *Kulluk.* Dang. Widely planted.

138. *Orgtenanthera*

O. monostigma, *Bedd.,* F.B.I.—VII-403. N. Kanara. Sukkar-Pathar. Widely W. Ghats.
O. Stocksii, *Munro,* F.B.I.—VI1-403. *Chiwari.* N. Kanara, *Talbot.* Paucbgani. Planted. Nov.

138. *Dendrocalamus.*%

D. strictus, *JVees.,* F.B.I.-VII-401. *Kania Wans.* Panchmahals. Planted in Konkan.
D. giganteus, *Munro,* F.B.I.—VII-406. Gardens.

146. *Ochlandra.*

0. stridula, *Munro,* F.B.I.-VIII-41U. *Hooda.* *N.* Kanara, *Talbot.*

Copy of Extract from Annual Report by Mr. 0. A. Barber, Government Botanist, Madras, to the Board of Revenue, Madras.

I have the honour to forward the following annual report of the work done by the Department The period included is from April 1st, 1900, to March 31st, 1961.

2. The following were my movements:—

The first half of April was spent at Head Office and devoted to routine clerical work. Several visits were also paid to the Dodabetta Cinchona plantations.

Immediately after the Easter Holidays, I proceeded to Waltair (which I reached on April 22) to collect over the Vizagapatam forests. Under the circumstances detailed in my lnst report, much as I would have liked it, I was quite unable to attempt the more enticing higher Agency tracts, but, because of the condition of my staff, I had to confine myself to the lower, hot hills of the Golgonda taluk. Erom the specimens obtained, however, I do not think that these parts have been collected over before.

I visited the following places in the Vizagapatara District:—

Pollavaram on thesea*coast (April 27—30); Kagupalem, in the *dvv* scrub forest near the Kailway (May 2—10); Karaka, on the fine slopes of Karakakonda (May 12—21) ; Krishnadevipeta, just within the Agency tracts (May 22—June 2); Nathavaram (June 2—12).

Krishnapuram again within the Agency (June 10—18),

After this 1 devoted myself to the study of date palms and examined them wherever I couH, on my return eastwards. They were inspected at Lakshmipuram, near Narasapatnam, Makarapalem and around Anakapalli and Kondakerla.

I reached Ootacamund on July 4. During the next three months, with One short interval, I remained at Head-Quar:ers. The monsoon was an extremely long-continued one and touring on the "West Coast was rot to be thought of. The shore visit to Devala, referred to below, was during continuous heavy rain.

This period at Head Office was, however, not so productive of good work as could be wished. My staff was, for the first six weeks, almost continuously absent owing to fever contracted duriug tho Vizagapatam tour, and the wri er was practically absent from his duties during the whole of this period. He finally left the Office through ill-health, aud my new clerk did not join until the eve of my departure for South Cnnara.

Under these circumstances, a good deal of clerical work fell to my lot.

An attempt was, however, made to grapple with the naming of specimens collected on tour; and the general lines of- work were for the first time settled with my assistant. The more important work of an economic nature during this period was the examination of specimens of tea seedlings from Devala which had been attacked by a root eel-worm.

For this purpose also a short visit was paid to the infected estate (August 30 to September 7). A few orchids were collected'which were new to the collection; the tea estate was inspected and visits were paid *en route* to the Nadavattam cinchona plantation and one Nilgiri tea estate.

On October 5, I lett Head Office for a tour in the South Canara, forests. The following places were visited :—

Sullia (October 25—November 5).

Sampagi, at the foot of the Meroara Ghat (November 5—16.) During nay stay at Sampagi, I proceeded ou November 11 up the Ghat to Mercara. And on November 12, I collected specimens for the first 18 miles down towards the Coorg boundary. A number (over 100) of interesting plants were found during this little trip.

Jahlsur (November 16—22).

Beltangadi (November 21—29),

I reached Oofaoamund on December 8. The remainder of the month was taken in arranging my collections and working up Office arrears.

During the Christmas Holidays I had the pleasure to entertain Mr. Willis, the Director of the Ceylon Botanical Department. As his object was the same as my own, the exploration of the South Indian Flora, I accompanied him on a short tour to Pykarato to examine the river flora there.

I remained at Head-Quarters from December 9 till January 26.

During this time I was without the help of my assistant Mr. K, Hanumantha Row, who desired to present himself for the M. A. examination in Botany in Madras. At the end of the month, however, instead of returning to his duties, he sent in his resignation in an entirely unexpected manner, thus placing the department in a very awkward position on the eve of my next long tour.

I prepared in January a long memorandum upon the work of the Office, a report on the tea-eel-worrn disease at Devala and a shorter one on an infestation of white grub which has been known for many years in the Nilgiri*.

I left Oataoamund on January 26 and remained in Madras till February 6, engaged among other things in examining candidates for the post of assistant.

I then proceeded to the Godavari district and spent from February 7 to 28 in the examination of the sugar cane field.

I visited the following places :—

Tapeswaram, Mandapeta, Pasalapndi, Vulapalle, Panwalapaku, To^sipudi, Komaripalem, Koppavaram and Biccavol in the Rnmachandrapuram taluk : Mondepulanka, Nagadulanka, Tatipaka, Rozole and Sivacodu in the Narsapur taluk : Peddabrahrnadeva, Medapadu and Bliimavaram in the Cocanada taluk : and Ragampeta, Vedlamurru-Pulimeru and Gudivada in the Poddapuram taluk-

On February 28 I proceeded to Calcutta by train and remained there until March 18. In Calcutta I spent most of my time with the Director of the Survey at the Royal Botanic Gardens, Sibpur. I also spent several days with the Reporter on Economic Products and called upon the Entomologist to the Government of India.

• I reached Ootacamund on March 27, and th*n had the pleasure of receiving visits from Dr. Stuhlman, the Director of Agriculture in German East Africa, and Mr. Augustine Henry, the pioneer botanical explorer in Central China.

3. The collections made during the past year were again large. Part of them were noticed in my last year's report. The districts may be divided up as follow:—

(a) Evergreen forests.—South Canara, M"ercara and Wynaad.
(b) Mixed forests—Vizagapatam District.
(c) Sea-side flora.—Pollavaram (Vizasrapatam).
(d) River flora of Podoste uonaceaB, Beltangadi, Sullia, Sampagi in South Canara and Pykara on the Nilgiris.

It is difficult to speak of the character of the collection because they are far from being thoroughly studied yet.

The West Coast was visited for the first time, and it is quite evident trom the collections made that a series of visits down the entire length of the western Ghats will be of advantage. The portion examined during the boutu Canara tour was the Mamralore-Mercara road and in this district further visits should be paid to the portions north and south of this tract where tne flora evidently differ a good deal. Both the north and south portions of South Canara near the hills seem to be little known, and have certainly not been visited by botanists frequently, if at a[1]1.

During the South Canara tour a good deal of attention was devoted to the curious little river group of Podostemonaceae. These plants, like mosses and lichens in appearance, are in reality degraded forms of higher plants, the body of the plant simulating the lowest forms in the vegetable kingdom' but minute flowers, consisting of one stamen and one ovary each indicating their true taxonomic position. The relationship of the order among the higher plants lias not been determined, and the collections from South Indian rivers, one o£ their principal habitats, are extremely meagre.

My attention was specially drawn to the group by Mr. Willis who has just concluded a tour down the Western Ghats in search of material for a monograph which he is preparing. I found the river at Sullea full of three species, and again at Bultagadi there was such a mass of interesting specimens that I devoted myself to the river bed during the whole of my stay there. The result has exceeded expectations, and a very interesting series of specimens has been handed over to Mr. Willis for determination. Curious transitional forms were found which will necessitate an alteration of the classification, and some of the species are new to science.

Daring the Christmas Holidays the short tour to Pykara in Mr. Will* company was devoted to the same group.

The tour in Vizagnpatam was also interesting in its way although the time of year, May to June, was hardly the most desirable to explore this hot region. From the plants collected it is at once evident that the parts nearer the hills had not been previously visited. Some of the species described as extremely rare in Hooker's Flora and not represented in the later collections of the Madras and Calcutta Herbaria, was found in great abundance.

During the short tour in the Wynaad in September while examining **tho** tea-eel-worm, disease, a few roadside orchids were collected. Several of these appear to be new to South India and one at least is a new species.

These facts will sufficiently show that there is plenty of work to be done in various parts of the Peninsula. To leave the more distant places out of the consideration, the results from the neighbourhood of Devala, not more than 40 miles from Ootacamund, indicate that this tract is by no means worked out, and during the year a new species of orchid has been found abundantly in the neighbourhood of Ootacamund itself.

4. In my last report the accumulation of arrears in naming the plants collected was adverted to. Since that time a change has been made in the distribution of the Government Botanist's time in the field and at Head-Quarters. Instead of four months at Ootacamund, a stay of six months has been sanctioned. One tour in eacli year will presumably be devoted to economic work, and there will thus be a smaller accumulation of plants to be booked through, in that fewer plants will be collected during the year.

It will be evident that during the past year there were unusual difficulties caused by the sickness and absence of the clerk, and more specially by the unexpected resignation of the assistant. But a serious effort was made in August and September to put the past collections in order. About" 1,200 sheets were examined, named and added to the Herbarium.

It has not, however, been possible to devote more time than this to the purely systematic work while at Head-Quarters.

In spite of the Government order sanctioning the longsr stay at Ootaea.-mund, considerably the givater portion of the working year was spent in the field. An attempt will be made in the current year to remedy this state or affairs, but it will not be easy. So much time is taken in getting to and returning from the centres of collection, especially on the West Coast, that the two months provided for each tour are hardly sufficient, and is especially f* when, as is frequently the case, matters *jot* routine or questions of economic interest have also to be attended to.

It tlius remains to be determined whether three principal tours will b0 possible each year, unless one of these is carried out, in part at least, by an assistant. At present, however, the assistants are hardly fit to be entrusted with such work.

5. The strength of the staff remained the same as last year, but, as already explained, the department was frequently short-handed when the Government Botanist was at Head-Quarters.

In February **l:*01,** Mr. Venkata Krishnama Nayudu, MJL, of the Madras University, joined as assistant in place of Mr. K. Hanumantha Row, B.A.* resigned.

The new year will open with two assistants at Head Office instead of one, and a considerable increase in the usefulness of the department may be confidently expected. It must be borne, however, in mind that these will have to be trained and that a couple of years must elapse before they will be of much service

in the more responsible work of naming plants. After two years of training, the late assistant was entrusted with certain portions of the work, such as making a preliminary study of the field collections and naming the orchids and grasses. It will require a proportional period of time before the new assistants can be entru ork, and, for the present, with the necessary training that , the Government Botanist's hands wiU b, rather fuller than before.

6. As reported last year, a request was warded from the Government Botanist, that he might be allowe rt %£ ° £° forconsultation with the North-Western Provinces, to pay a o v o r n m e n t and the Director of the Survey of India, 1ms was gt aniBU "J . visit took place during March 1901. These did not include all the plants about whwh abtwas felt during the was insufficient to determine, but J 8 , t brou ht back toOota- alone. Of them, 101 were worked through J 'he re ot d and the Grewias, camund. About four new specimens " « V a reful analysis, a feature of our mixed forests, were with the

A great deal of useful information was g « « * " had arisea sinee the Director, whose advice was sought on many m a t,o wh ch naa Government Botanist had taken over Mr. Lawson's dunes.

A careful study of the mode ot workmg and t requ,r ements of Reporter oa Economic Products was made, as far as they re re d to econom Lotany and every facility was placed « *Je w g r t b a fa in the Calcutta 0(fice and to make use of the files ****V *?£?-JS" ranged that the files on Museum. In questions of difficulty, it tf Goye rament Bota- particular subjects may be sent d o * - .tto SStSLted in the Office of the nist and thus the stores of i n f P 1 0 . . J Prdsidency, without Reporter on Ec the necessity of

hs of the

Calcutta was so great that an early W J U g P»«ta. » visit and deal with another batch of the do ab U V a J s o Indian plants concern- if time permit, to work up any of the P « . h 7 | S n c y. The cold weather ing which there is i" 8 dien*i n f o n of JTe Peainsula, and since the tour will frequently be in the aorthem part ot we Pea nsula, ana sinoe m« Government Botanist is then ne.rer to Calcutta than to Madras, there would appear to be less difficulty in his makingthe visrtat ina time vear.

17 A zzzl J«i «r ouU-i - »«« in TTnited States Government grasses. A collection has been forwarded to the United a ear. Agrostologist in exchange for those received f o m fc Bofcaaist of New

A* the result of oorrespondenoe with the», £ d a S3ries of exchanges South Wales, a set of grasses is expected from mm *u will be entered into. unt-rifcfc has been directed to the que?-

The attention of the G ° v e r f m e n i r S r a s Presidency, and a list has been ttoa of grasses and fodder plan sm the M a P r has been commmcedat the instance of the tores» « F rt of the assistants, since the definitely postponed for the present by^thej&a gpeoial wor k . it wi 1 naming of grasses was p«t of Mr. " T fM * nt seco(1 assistant is able to devote however, be taken up again as soon as the new himself to it. Bota iiist to Forest Officers to send up

The invitation of the GovernmeotJJJ'has met with some re oogmtioa special collections of interesting forest plants during the year. the patriot Forest Officer of Coimba-

Three sets of grasses were sent by tne *im tore and the names forwarded to him. Oons0rva tor of Forests, Northern

Two parcels were received from » £ £ Vizagapatacn. These have not Circle,and one from the District ^*°Z^ou& assistant's attention imme- yet been attended to, but will occupy the seconu mately.

8. Various requests for specimens have been received from scientific men in other parts of the world.

Enquiries have been received by specialists in Germany for South Indian Myrsinese and Caricesa.

Podostemonacese are being collected for special monographic purposes.

Requests have been received for South Indiau Hepaticse, Ebenacese and parasitic plants.

The Reporter on Economic Products requires specimens of timbers, foliage and photographs for his museum in Calcutta and various other enquiries have been received.

It will be obvious that, for the department to be useful in the true sonse oE the word, it is advisable to endeavour, as far as possible, to meet with these requests, and an attempt will be made to do so. On the other hand, it will be equally obvious that no special expeditions can be undertaken excepting to Government work, and the particular specimens referred to can only be collected during the ordinary tours. The Government Botanist will, however, still practically single-handed, and work of this nature will be slow.

9 , * * * * * *

G. I. C. P. 0 . - No. 220 R. & A.—26-7-1901.-360.—H. R. & E. P.

Report of the Director of the Botanical Survey of India for the year 1901-02.

1. *Survey of Eastern India.*—The allotments provided for Botanical Surveys in Bengal, Assam, and Burma have been expended in full. In Bengal attention has been mainly confined during the past year to the Tributary States of Chutia Nagpur and to other outlying parts of the province. In Sikkim trained Lepehas have been employed in making collections of particular natural groups of plants that call for special study. In Assam attention was principally devoted to an exhaustive collection of the plants constituting the rabi crops of the province. In Burma the botanical exploration of the Tenasserim forests was continued.

2. *Survey of Northern India.—The* principal botanical survey work of the year was in Kashmir where, as in the Eastern Himalaya, attention was chiefly given to particular families of plants that require special study.

3. *Survey of Western India.*—The chief botanical survey work of the year was done in the Southern Mahratta country and in the districts of Satara and Poona. Special visits were also paid to various localities in order to obtain material illustrative of particular species required to assist Dr. T. Cooke in the preparation of his *Flora of the Presidency of Bombay,* of which two parts have so far appeared.

4. *Survey of Southern India.—In* connection with this survey special attention was devoted to the nature and composition of the Tinivelly and Anamalai forests.

5. *Publications.*—The concluding part of the first volume of the *Becords of the Botanical Survey* (No. 13), which had been sent to press before the close of the previous year, was issued in July 1901. Two contributions to a second volume, Part 1, on the *Flora of Chutia Nagpur* by Surgeon Lieutenant-Colonel J. J. Wood, I.M.S., retired, and Part 2, on the *Plants used during famines and seasons of scarcity in the Bombay Presidency,* by Mr. G. A. Gammie, were sent to press, but were still unissued at the close of the year. The Director, while on leave in Europe, prepared in conjunction with Mr. *h.* C. Baker, of the British (Natural History) Museum, sime *Notes on Indigojera,* in connection with his enquiry into the cultivated Indigos; this paper was published in the *Journal of Botany.* The *Flora of the Upper Gangetic Plain,* on which Mr. J. J. Duthie is engaged, has made considerable progress during the year.

6. *Economic and Agricultural Botany.-Mach* attention jontmued to be given to various fibre-yielding species and to the question of the introduction from countrS othe/than °India of fodder-plants with a reputation for

similar drought-resisting plants. The numerous attempts that have been made to naturalise plants of this class in India show that, in tracts where, in a season of scarcity, the existence of such as fodders would be invaluable, they will not survive under what are to be considered normal meteorological conditions, and their cultivation or natural

many quite as suitable and valuable native species. The systematic endeavours of the past two years to introduce into India an American fodder-grass, *Paspalum dilatatum,* which, on being imported to ft. Australian colonies,

gained in these latter a high reputation for its drought-resisting properties, affords an instructive instance of these facts. Various correspondents to whom seeds of this grass have been issued by the Director have kindly complied witn his request to supply him with accounts of their experience. The reports from different provinces are somewhat conflicting. Partly on this account, and partly because the period over which the operations have extended does not coincide with the limits of an official year, the *precis* of these reports which has been prepared is given as an appendix to this report. It may, on the whole, be concluded that, as is usual in the case of popular estimates, the superlative merits attributed to this grass in public journals are not justified by actual facts. The Director's investigations of the natural characteristics of the dye-yielding Indigos have not yet been concluded. So far as they have gone they seem to indicate that the species now chiefly cultivated in Northern India is not the plant employed for the purpose in the time of the Emperor Akbar. The change of species no doubt resulted from the empirical discovery that the plant now grown, which is a `Malayan form, is better suited to local conditions and more valuable as a source of the dye than the North African species which it replaced. It appears, however, that in a third species which is widely spread in South-Eastern and Eastern Africa we have a plant possessing many advantages over the kind now cultivated, and it becomes a question, if indeed the interest now shown by Indigo-producers in the plant from which the dye is obtained has not been too late of being aroused, whether a change similar to that effected a century ago might not again take place.

The experimental cultivation of the various Indian Yams *(Dioscorea* sp.) has been undertaken on behalf of the Reporter on Economic Products. The results of the first year's experiment have shown that another season's observation is necessary in order to clear up points that are still doubtful. I" is proposed that a joint revie T of the results be drawn up by the two departments when the enquiry is complete.

The officer in charge of the Botanical Surrey of Western India has made an exhaustive study of the various plants used in times of famine and scarcity in the Bombay Presidency. The officer in charge of the Survey of Southern India has continued his careful study of sugar-cultivation in the Godavari district. The various other economic enquiries undertaken during the year in. Northern, Western and Southern India are referred to in the reports prepared by the respective officers in charge, and need not be recapitulated here, the three reports being submitted in original.

7. *Cryptogamio Botanist.*—This officer arrived at Calcutta on April 5th 1901, and was attached to theJBotanical Survey throughout the year. The new officer, Dr. E. J. Butler, did much excellent work and greatly impressed the Director by the enthusiasm with which he laboured as well as by the expert knowledge and sound judgment he displayed in carrying out his investigations, which were all of a useful and practical nature. It having been found undesirable that the Cryptogamic Botanist should continue to be an officer of the Botanical Survey, he was removed at the close of the financial year. A detailed report on the work accomplished by him during 1901-02 will therefore reach Government through another channel.

8. *Staff.*—The Director was absent for six months from 20th June to 19th December 1901. The officer who officiated was Captain A. T. Gage, I.M.S. The surveys of Northern, Western and Southern India have been in charge of Messrs. J. F. Duthie, G. A. Gammie, and 0. A. Barber, respectively, all of whom have done excellent work.

DAVID PRAIN,

I>irector, Botanical Survey of India*

Annual Eeport of the Director of the Botanical Deparfcrmnt, Northern India, for the year 1901-02-

On the 1st of April, I returned to Saháranpur from Dehra, after taking part in the final examinations at the Imperial Forest School, and on the 10th of that month I left for Mussoorie, where I remained (except for a few' days spent at Simla towards the end of September) until the 12th of November, A. severe attack of influenza whilst at Dehra, followed by acute sciatica, unfortunately prevented my accompanying the Forest School students on their hill tour during the months of April and May, and also seriously interfered with my work at Mussoorie. I left Saháranpur about the middle of January for Calcutta, where I spent about a fortnight at the Royal Botanic Garden with Dr. Prain, to whom I am always much indebted for valuable assistance and kind hospitality. From the 18th of March until the end of thifc month I was at Dehra for the examinations at the Imperial Forest School.

Botanical Tours.—The only extensive tour undertaken during the year was in Kashmir, where I sent Ináyat Khán, my head plant collector, early in May. He spent about four mouths in that country, and the specimens he brought back were of great value. As the Kashmir flora is very largely represented in the Saháranpur herbarium, he was instructed to confine his attention chiefly to the collection of certain kinds of plants, specimens of which were required for special study. These special collections include very fine sets of all the different kinds of Bilsams *(Impatiens),* and one complete set, together with flowers of each gathering preserved in spirit, has been despatched to Sir Joseph Hooker, who is preparing a monograph of the Indian species. He also made a very gool collection of the Kashmir Irises, prepared in the same manner, and these have been sent to Mr. J. G. Baker, late Keeper °f the Royal Herbarium and Library at Kew, and an eminent specialist in regard to the Iridacese and other allied natural orders. ^ Some interesting orchids were also collected, including an undescribed species of *Neottia* and another belonging to the genus Orchis; also *Epipogum aphyllum* and *Listera ovata,* which latter had not been C3llected by anyone in India since Dr. falconer discovered it in Kashmir many years ago. The particular parts of Kashmir explored by Indyat Khán last year were the Pir Panjál range, and the Liddar, Sind, Drás and Gurais \alleys ; he also travelled as far as Astoa on the Gilgit road, returning by the Kamri route.

Herbarium.—The additions made to the herbarium during the past year include the following valuable contributions :—

1.. From thé Herbarium of the Royal Botanical Garden, Calcutta—230 sheets of interesting miscellaneous specimens.

2. From Dr. George Watt, RGporter on Economic Products to the Government of India, 4 kinds of Aconite which were not represented in the Saháranpur herbarium,

3. From Dr. R. G. Leavitt, the Ames Botanical Laboratory, North Easton, United States, America.—A collection of rare North American plants, including many kinds of orchids.

4. From D* A. Engler, Director of the Berlin Botanical Garden and Museum.—Sixty-four kinds of Mossei and Hepaticae.

5. From Dr. N. Bryhn.—A large collection of beautifully prepared Norwegian Mosses.

Complete sets of the specimens collected in Hazdra during 1899' in Kumdon in 1900, and in Kashmir during the past year have been mounted 2ñ incorporated. Fresh material representing the fetation of North-J^est and Central India is being constantly added, and^ the value of the h<*bariu_m as a basis for the preparation of local floras has been increasing every year.

Local Floras.—The excellent Handbook on the Forest Flora of the School Circle, prepared by Mr. Upendranáth Kanjilál, Extra-Assistant Conservator of Eore&ts, cannot fail to be of very great use, not only to those for whom the book was specially prepared, but to all who may wish to learn about the trees and shrubs of this part of India.

The late Sir Henry Collett's " Flora of the Simla District " is now being printed, and copies of this work ought soon to be in the hands of those who are anxious to study the botany of a characteristic portion of the Western Himalaya. This hook will satisfy a demand far beyond the limits of the particular area dealt with, as so many of the Simla plants are found in other parts of the Himalaya. A special feature of the work 13 the large number of admirable illustrations.

[c] The Flora of the Upper Gangetic Plain and of the adjacent Siwálik and Sub-Himalayan tracts.' The area dealt with in this work$_3$ on which I have been engaged for the last three or four years, is much larger than was originally intended, *viz.*, the *Upper Gangetic Plain,* as defined in the Introductory Essay of Hooker and Thomson's " Flora Indica" published in 1855. By extending the area towards the south and west, so as to include the whole of the watershed supplying tributaries to the Jumna and Ganges as far as the Sone and Gandak junctions on the west; and by moving the boundary on the north-east up to thn base of the Himalaya proper, so as to include the Siwálik range of hills and the intervening duns, such as Dehra Dun, a more compact area and a better defined boundary was possible. As, however, the flora of a large portion of the country included within the extended boundary is much richer than that of the original area, a very large number of additional species have to be accounted for. Notwithstanding the extra work entailed I am doing my best to have the book completed by the end of December next.

As to the remaining area allotted to the Botanical Survey Department of North India, the Saháranpur Herbarium contains ample material for the preparation of at least four more local floras :—

1. The plains of Punjab and Bŕajpuťana.
2. The Central Provinces.
3. The North-West Frontier.
4. The North-West Himalaya from Hazára and Kashmir to Kumáon.

DISTRIBUTION.

Herbarium specimens.—Sets of duplicate specimens were distributed to the following addresses :—The Director, Botanical Survey of India, Calcutta ; Director, Imperial Forest School, Dehra; the Director, Royal Gardens, Kew; the Keeper, Royal Botanic Garden, Edinburgh ; Sir Dietrich Brandis, K.C.I.E., F.R.S., Kew; J. Sykes Gamble, Esquire, C.I.E., F. R. S., Hants, England * the Directors of the Rsyal Botanic Gardens at Berlin, Vienna, Florence and Strasburg; the Director, Imperial Gardens, St. Petersburg ; the Director? Jardin des Plantes, Paris; M. Casimir DeCandolle, Geneva; the Boissier Herbarium, Geneva; MM. Copineau and Mouillefarine, France; Professor M. Gandoger, France; Dr.W.'Lambart, Saxony, Germany; Dr. E. llosenstock, Gotha, Germany; Sig. G. E. Mattei, Bologna, Italy"; M. Usteri, Zurich, Switzerland ; J. Medley Wood, Esquire, A.L.S., Durban, Natal ; Sir. P- ^' Wilson, Philadelphia Commercial Museum, U.S.A.; P. W. jUnckinnon, Esquire, Mussoorie; Dr. *R.* G. Leavitt, N. Easton, Mass., United *t* tates,' America (orchids); Professor R. Schlechter, Berlin (orchids and Asclepiadacese); Dr. Fritz Krănziin, Berlin (orchids); Professor H. Marshall Ward, Cambridge (Indian species of Bromus); the Reporter on Economic Products to the Government of India (two kinds of Andropogon yielding Rusa or Nimar oil* together with samples of tlie oil) ; Dr. Alwah, Eaton, Seabrook, United States, America (species of Equisetum); Dr. N. Bryhn, Honesfoss, Norway (a collection of Indian mosses); H. M. Lenox-Conyngham, Esquire, A.V.D., Allahábad (a collection of Iriilian Fodder grasses); Dr. Hemchandra Sen, Campbell Medical School, Calcutta (specimens of Indian medicinal plants).

In addition to the above, collections of Iris bulbs were despatched to Sir Michael Foster, K.C.B., F.R.S., Cambridge; seeds of Himalayan plants to A. *K.* Bulley, Esquire, Cheshire, England; and seeds of Apocynum venetum, a valuable fibre plant, were sent to the Superintendent, Residency Garden, Quetta.

***Office Establishment.*—The draughtsman, H. Hormusji, has completed several excellent drawings of *new* and interesting plants, including nine kinds of orchids for the book now in preparation on the Orchids of North-West and Central India. His time is now fully occupied in colouring sets of the lithographed plates for that work.**

My Head Clerk, Umráo Singh, and the Assistant Clerk, N. Hutchinson, have worked satisfactorily during the past year.

J. F. DDTHIE,
Director, Botanical Department^ Northern India.

MUSSOORIB ;
The 27th June 1902.

APPENDIX.

Financial Statement of the Botanical Department, Northern India, during the year 1901-02.

BOTANICAL DEPABTHEHT.	EXPENDITUBB.							RECEIPTS.			
	Director's salary.	Exchange compensation allowance.	Establishment.	Travelling allowances of Gazetted Officers.	Travelling allowances of Establishment.	Contingencies.	Total.	Fodder GraBS books.	Fodder Graes albums.	Miscellaneous.	Totfl.
	* o. p.	*R a. p.*	ft *a. p.*	*S a. p.*	*Rap.*	*R a. p*	*R* ». P.				
Budget Grant for 1901-02	12,000 0 0	750 0 0	4,070 0 0	1,700 0 0	300 0 0	2.240 0 0	21,060 0 0				
Expenditure during 1901-02	12,000 0 0	749 1 5	4,204 10 4	992 8 0	290 5 6	2.231 11 0	20,468 4 3				
Balance		0 14 7		707 8 0	9 10 6	8 5 0	591 11 9				
Realized by tialo during 1901-1903.								34 8 6			34 8 6

* Includes R154-0-9 paid for halting allowances to the Draftsman and Assistant Clerk for haltings at Mussoorie.
The actual expenditure during the year under this head, B4.06O-9-7.

J. P. DUTHIE,
Director, Botanical Department, Northern Indie

MUSSOORIE ;
The 27th June 1902.

Report on the Botanical Survey Operations in the Bombay Presidency for the year 1901-02, by 6. A. Gammie, F, L. S., Officer in charge of the Botanical Survey, Bombay Presidency.

I held charge of the office of the Botanical Survey, Bombay Presidency, throughout the year. Owing to the loss of my records in the disastrous fire which utterly destroyed the Herbarium on the 1st May 1902, I am unable to furnish complete details of some important investigations conducted during the year under report. Thanks to the generous offers of assistance tendered by many botanists, the labour of re-forming a Herbarium will be appreciably lightened.

1. *Tours.*—During the hot weather vacation I botanized closely over a part of the Poona Ghats on special researches and also undertook a journey through a portion of the Southern Maharatta country lying between Londa and Gokak. During the autumn vacation I went over the eastern and northern parts of the Poona district, engaged on special researches, and finally I visited the adjoining parts of Satara. I also paid a visit to Kandgaon to inspect the experimental plantation of Sisal Hemp.

Mr. Bhide, the Herbarium Keeper, made a tour in Kanara from Haveri to Devimona Ghat and to Castle Rock, and also visited the forests in the vicinity of the Kanheri Oaves in Thana in search of plants required by Di\ Cooke to assist him in clearing up doubtful points for his Flora of Bombay. In addition I devoted much time to the supervision of plant-breeding experiments on the Poona Farm.

2. *Herbarium.*—Many sheets of specimens were incorporated, but these, of course, shared in the general destruction. The Superintendents of Victoria Gardens, Bombay and Empress Gardens, Poona, supplied many interesting plants for identification. Mr. V. B». Damb, a passed student of the college, now in the Forest service, was good enough to send specimens of noteworthy plants.

3. *Publications.*—In compliance with the instructions conveyed in the Resolution on my last report, I put myself in communication with the Collectors of the districts affected by the recent famine and, in response, I received a great number of plants said to have been used as food^ during that time. These were identified after much labour, as many arrived in a condition unfavourable for botanical examination. The vernacular names under which they were sent were carefully noted. Being plants used as food I thought that the names given would probably be correct. Our knowledge of the vernacular names of the smaller plants, especially those of Gujerat, is still very incomplete. A full list of these plants was supplied to the Director, Land Records and Agriculture, for incorporation in the next edition or the Statistical Atlas, and a detailed account with notes was despatched as a contribution to the Records of the Botanical Survey of India. This will probably be published at an early date. Dr. T. Cooke (under the auspices of the Secretary of State for India) has published the second part of his Flora of Bombay, bringing his account down to the *Legwminosa.*

4. *Catha edulis* l'orsk,-M* of Arabia. My predecessor, Mr. Woodrow, drew the attention of the Director of Agriculture to the fact that a plant of this species grows in the College of Science Garden. It has attained a good height and its appearance is that of an overgrown tea plant. Within reach of irrigation it would thrive admirably in Poona and its history marks it as a plant worthy of a place in every large garden.

5. *Sisal Hemp.—A* large number of young plants were supplied to the Divisional Forest Officer, Nasik, and smaller numbers were top jtohedto the Revenue Department, Government of Madras, and to various applicants for experimental purposes.

By the courtesy of the Director, Land Records and^Agriculture, I was allowed to put out 4,000 plants on a piece of grass land in the old Botanic

Garden at Ganesh Khind. These plants established themselves quickly and appear very vigorous and healthy. The plants at the experiment^ p1[ot at] Nandgaon are also thriving. As sisal culture is now an established industry, these two plots will suffice for experimental purposes. Another large consignment has been promised to the Divisional Eorest Officer, Nasik. The plant could also be utilized as a profitable hedge in most localities in the Demean. During the year eleven plants flowered and produced bulbils, but as their production has still not ceased, the number cannot be given till next year.

6. *Sabai Grass.*—No application for seed was received during the year. The Managing Agents of the Reay Paper Mills complain of tbe number of hard flower stalks which have to be sorted out before the material is fit for paper-making. I observed on their land that clumps in the shade did not develop flower stalks so numerously and therefore recommended that *Shevri* (Sesbania segyptiaca, *Pers.)* should be grown throughout the plots. This is one ot the quickest growing shrubs in the Deccan. It has a beneficial effect on the soil and is also a good fodder. An experiment was tried to test the suitability or otherwise of the climate for *Esparto* (Stipa tenacissima). The grams germinated well and the plants made fair growth during the cool season, but during the hot weather, they languished and merely lingered. As they did not altogether die they may yet become acclimatised, but the outlook is not promising.

7. *Economic Work.*—The examination of the famine plants has already been alluded to. An exhaustive study was made of the wheats grown on the Poona Farm, and the results of the investigation were forwarded to the Inspector General of Agriculture. A commencement was also made in the selection and hybridisation of several forms, and some men were trained to perform the latter operation. It will, of course, entail patient work for several years to produce tangible results. Several varieties liable to be affected with rust were crossed with *khapli* or spelt (which is absolutely rust-proof) to discover whether the progeny would inherit the rust-proof habit. A gentleman in the United States, who has paid much attention to the breeding of cereals, gave me the interesting information that the *khapli* of Western India is identical with the *emmer* of Siberia, which he was utilizing to produce rust resisting crosses.

The *Triticum pilosum* of Dalzell and Gibson is the *JBakshi,* which yields the finest hard white Bombay wheats. It is not, however, cultivated in the Concan but in the Deccan. I have to thank Mr. R. K. Bhide for his assiduous work in the Herbarium and field. Mr. Madane, the Head Plant Collector (who has since died, to my great regret), worked well, as did also Mr. L. D-Gharade, the Second Plant Collector.

GEORGE A. GAMMIE,
In charge of the Botanical Survey °f Bombay Presidency.

POONA ;
The 14th July 1902.

Annual Report of the Government Botanist, Madras,

I have the honour to forward the folio *win** annual report on the work done by my department. The period included is from 1st April 1901 to 31st March 1902,

2. The following were my movements during the year:—

The month of April was spent at Head Office. A careful study of the plague of cockchafers was made at Oofcacamund and a long report prepared on the G<5davari sugar-canes.

On 8th May I left Head Office on a three months' tour in Tinnevelly. Collections of grasses were made at different parts of the district and special attention throughout the tour was devoted to forest trees in the mixed and evergreen forests. A short visit was paid to the sub-alpine region around ivahvayalpil aod a large number of interesting plants were obtained in an ascent of Agastiar Malai (6,000 feet).

I reached Ootacaomnd after a short visit to Madras and remained there irom 1st August to 2nd October. As some of the specimens were found to be mouldy, the whole collection was thoroughly overhauled. A certain amount of herbarium work was done during the monsoon, special attentions being devoted to the forest trees.

At the request of the Forest Department, the next tour, 2nd October to 17th November, was spent in the Anamalai forests. Here the evergreen forests were again carefully collected over. The weather was exceptionally bad, and most of the trees had neither flowers nor fruits upon them. A trip to the Grass Hills (7,000—8,003 feet) produced some interesting mountain plants.

From 17th November to 23rd January I remained at Head Office. A preliminary study was made of the Anamalai forest trees and a good deal of attention was devoted to experiments with white grubs and to preparations tor the G6dávari sugar-cane station.

The remainder of the year was spent in the Gódávari district. A considerable time was devoted to the sugar-cane station, but the canals were toured over and a special study was made of the date palms of the neighbourhood.

3. It will be seen that there were two main collecting tours, both primarily in the evergreen forests, although other tracts were also traversed.

The high forest was studied at Kannikatti in the Tinnevelly Hills and &t Paralai in the Anamalais.

Deciduous or mixed forest at Mundanthorai, Kannikatti, Courtallam and below Poonachi.

The sub-alpine flora was collected at Poonachi (5,000 feet), Kalivayalpil (4,000 feet), Agastiar Malai (6,000 feet), and the Grass Hills above Paralai (7,000—8,000 feet).

Considerable attention was paid throughout the year to grasses, aii.l special collections were made at Palamcottah, Ambásamudram, Mundanthorai, Courtallam, Aulankolam, Pollachi, Poonachi, Ootacarnund, Dwarapudi and ^fanapta, in order to determine their relative distribution.

It is too early to speak of the value of the collections made. Several undoubtedly new species have been found, and many valuable additious have been made to our collections of forest trees and grasses.

4. Progress in the herbarium has been considerably greater during the year. The work was hampered by a somewhat serious accident which kept the plant collector in hospital for some months, but the addition of a second Assistant to the staff has made itself very distinctly felt. A larger number °f plants was collected than in any previous year. This will be seen from the accompanying figures of plants collected during the last three years.

From January 1399 to Marc[1]! 1900 (tours in Madras, Tinnevelly, South Arcot and Ganjam) collection Nos. 1—1,500.

from 1st April 1900 to 31st March 1901 (tours in Vizagapatam and South Canara) collection Nos. 1,501—2,700.

Prom 1st April 1901 to 31st March 1902 (tours in Tinnevelly and the Anamalais) collection Nos. 2,701—4,300.

Over 4,000 sheets of specimens have been poisoned and mounted. The heavy arrears in the herbarium are being taken in hand and the constant attention of one assistant is devoted to the collections.

5. Several additions have been made to the herbarium from outside sources. A fine set of Assam ferns has been obtained by purchase ; a set oi grasses has been received from the Director of the Botanic Department, Sydney, New South Wales ; and a certain number of ebonies and grewjas from Ceylon. Sets of specimens were sent to the United States of America Agrostologiat and the Botanic Departments in New South Wales, Ceylon, and Calcutta. A few specimens were sent to the Madras Museum for tue Index collection and a number of spirit and dried plants obtained for *VT** Bourne for class work in the Presidency College.

'C. A good deal more work of an economic character has been done during the year than in any previous one. Nevertheless, many matters have had to De left untouched and scant attention has been given to others.

The subject which has received most attention has been sugar-cane cultivation. A parcel of canes from Udamalpet was found to be infested with moth-borer, Chilo simplex. Traces of fungi were also found, but only in the hyphal condition, and therefore not determinable, The moth-borer, which causes tne appearance known as " dead-heart " in the young canes, is known wherever the sugar-cane is grown. It usually is most abundant when the plants have had unseasonable weather in the early stages of growth. A short correspondence -was carried on concerning the recent introduction into Viziana^ram of a number of kinds of Mauritius canes. Special attention was again devoted to the canes in the G6dávari district. A long report was prepared at the begining of the year on the introduction of Hospet canes, and the months of January to March were devoted to the founding of an experimental sugar-cane station at Samalkot.

7. During the long halts at Samalkot a careful study was made of the mode of tapping and general life of the date palms of the district. It was noted that the mode of cutting the treos for toddy was very different from that practised in Vizagapatam, also that the number of deaths from overtapping was very much larger. • It was not difficult also to find the palm weevil, llhynchopkorus ferrugineus, in the trees.

As it was not found possible to arrive at certain conclusions from casual visits to a number of different plantations, a definite area was submitted to aB exhaustive analyses. Half a mile of date trees were counted and all the dead ones carefully examined. Two facts were at once evident. Firstly, all the trees had died shortly after tapping, for they always showed the slanting cut at the top, and secondly, the great majority of them had no trace of borer or other such injury, so that the conclusion was forced upon one that the chief cau^e of death was overtapping. A report on the subject was forwarded to the Board of Revenue.

8. The "white grub" of the Nilgiris received a good deal of attention during the year. These, it will be remembered, were held to be responsible for the failure of sowings of Seoni wheat which it was sought to introduce, and the Government Botanist was directed to make a study of them.

The " white grub " is the larval form of the cockchafer beetle. As it ^aS discovered that the chief flights of the latter occurred during the April-Ma? rains, collections were made with a view to identifying the species which were causing the damage. Specimens sent to Cambridge for determination proved them to be new or rare species, and a series of experiments were instituted *n order to learn something of their life-history.

As is well known, the study of the life-history of cockchafers is one of great difficulty and takes years to accomplish. Pits were dug at various periods to find out the condition of the pests and the different species were sown in order to find out which grubs belonged to the different beetles. These observations are not yet completed. A number of facts have, however, been brought to Ugh* which indicate the way in which the pest can be combated.

9. A disease in the Wynaad pepper plantations received a certain amount of attention. After a careful examination of the specimens received it was decided that study at a distance was useless. Several pests were found, and it is always a matter of difficulty to determine which of these has attacked plants weakened from some other cause and which has made an onslaught on originally healthy plants.

10. In conclusion of this review of the economic work during the year, I will mention some of the many other subjects of minor importance which have engaged our attention.

The following were dealt with :—Rust in wheat from the Palnis; minute insects (Aptera) among Cinchona seedlings, determined to be harmless because of the character of their mouthparts ; smutted Sorghum, remedies suggested and a scheme of experiments with recent methods dra#n up for the Saidapet farm; turnip fleas (Biagrada piota) in the Ootacainund gardens ; plant bugs (Nezara viridula var.) in the gardens and notably in the Cinchona plantations; difference in colour of coffee beans ; a destructive outbreak of green scale (Aspidiotus Camelliae) in the Kanan Devan Tea plantations; a coffee-root fungus in Coorg; a disease of the prickly-pear, unfortunately received in bad condition; Striga euphrasioides, etc, as pests in badly cultivated lands; sand binding plants as protection on the Bast Coast; salt bashes as fodder plants ; the requirements of the Durian tree as regards climate and elevation; fibre machines suitable for "Aloe fibre " ; and questions on Hydnocarpus, mosquitoes, Balsamodendron Berryi as a hedge plant, various species of Cassia as "senna," Tephrosia or " wild indigo " for green dressing, and many other referencss of minor importance.

11. A number of photographs have been taken of subjects of economic interest and a set of negatives has been sent to Dr. Watt for copying.

A considerable nuoiber of forest trees and shrubs have been named for forest officers.

A labelled collection of barks of A.namalai trees was made. These are to be handed over to the Conservator of Eorests, Southern Circle, for his Musetfm at Coimbatore.

As already stated a large collection of grasses has been made during the year. A set of 46 species was obtained in the neighbourhood of Ootacamund for the Supply and Transport Officer, Southern Circle, Wellington, and a preliminary list of South Indian grasses was prepared at the request of the Forest Department.

Considerable additions have been made to the collection of pests and diseases during the year, but efforts in this direction have been discouraged because the staff is fully occupied with other matters.

A commencement has been made towards the formation of a herbarium of plants grown as crops. This will form an important part of our future work. Such plants as sugar-cane cannot be preserved in this way, but a series of photographs to scale and analytical drawings have been made. For this kind of work, however, an artist will be needed and descriptions of varieties will be incomplete without a simple chemical analysis.

Appendix to Botanical Survey of India Report for 1901-1902-

PASPALTJM DILATATUM *Foir.*

Early in 1900 several enquiries regarding this grass were addressed to the Superintendent, Royal Botanic Garden, Calcutta, who at once took steps to obtain a supply of seeds adequate to "the sudden demand. This demand was the direct outcome of certain newspaper notices in which the grass was highly spoken of as a fodder and greatly praised for its drought-resisting qualities.

The grass itself is not unlike and is nearly allied to a well-known Indian species, *Paspalum scroliculatum*—Hindi *kodo* \ best known, perhaps, in connection with the poisonous properties it develops at certain seasons and under certain conditions. So far as is known, P. *dilatatuw,* which is a native of both North and South America, is free from this reproach. In Americ̣a, the grass, which extends into extra-tropical latitudes, has al ways been held in high repute tor the excellent quality of its fodder and because it keeps green during the hottest months or summer.

It was, with many other fodder grasses, introduced to Australia by the late Baron v.°n Mueller and in the Australian colonies has found much favour owing to its hardy qualities, from the rapidity of its growth when heavy rains follow drought, and espacially because of .i[ts] great drought-resistance. The notices in Indi an Journals were merely echoes of its Australian reputation.

In reply to requisitions addressed to them, the Governm ent Botanists at Brisbane and Sydney were able to send small quantities of seed; other Australian officers were unable at the time to assist. As the quantity received was wholly inadequate for his purposes, the Superintendent asked the help of the Agr ostologist to the United States' Department of Agriculture, who kindly arranged with a well- known firm of seed merchants (Wood & Sons, Richmond, Va.) for a substantial supply. The quantity asked for was 100 lbs. but, even from America, only 28 lbs. could be got.

Shortly thereafter the Government of India, in the Department of Revenue and Agriculture, also took the matt er up and, learning that their wishes had already been anticipated* have taken a warm interest in this effort to introduce the grass on an adequate scale into India. The seed received was, in consequence of this interest, issued not only to those parties who had applied to the Royal Botanic Garden for assistance, but to others who had applied to the Government of India direct or through the Reporter oa Economic Products. For this reason, and in consequence of the interest felt by Government in the subject, a *precis* of the report which parties receiving supplies of the seed were requested to send, is appended to the Report on the Botanical Survey for the year. The experiment, it may be remarked, is not ye[fc] concluded, nor have all the parties to whom seed was originally sent yet submitted reports. Moreover, the Government Botanist, Melbourne, who in 1900 was unable to help, has this year (1902) sent a large consignment of seed; this seed, with a considerable quantity harvested at Calcutta in 1901, and again in 19;)£, has also been freely distributed, and at least a year must elapse before the results of theae fresh sowings can be stated. A sufficient number of reports has, nevertheless, been received to warrant the formation of at least a preliminary estimate of the grass as regards its suitability for India and Indian conditions.

EASTERN INDIA.—*Central Bengal.*—At Calcutta the seed was sown in the open in February 1901; only a small percentage of the seed genuimtel. A second trial was therefore made in March 1901; the seed was then sown in pans in nurseries. The percentage wa9 carefully estimated ; of 18,950 seeds planted, only 105 germinated, or just over one-half° per cent. These plants were put out iu June 1901 when the rains had set in, by which time the plants of the February sawing were in flower. The plants of the February sowing formed sparse tussocks ; the transplanted plants of the March sowing, having been placed close together, formed a dense patch. In other respects the plants of the two sowings did not differ, all being equally healthy and robust and all yielding ultimately a copious crop of seed. The plot in which the first sowing was made and the pans used in the second sowing were watered daily and shaded till the seed germinated. After this no attention was given to or required by the plants ; the subsequent appearance of many self-sown seedlings makes it clear that the grass is quite at home under the conditions that prevail in Lower Bengal. These conditions, however, are such that the experiment at Calcutta throws no light on the main question, the suitability [or] otherwise of this plant for poor or parched soils. As a fodder the grass as grown at Calcutta is excellent.

Chutia Nagpur.—Seed sent through the Director, Land Records and Agriculture, to Palamow, in Chutia Nagpur and sown in August failed to germinate at all. Seed of the same consignment, sent through the Reporter on Economic Products, to Maubhum, where the conditions are not unlike those at Palamow, did not germinate well in proportion to the bulk sown, but the plants thac did come up flowered and seeded. The grass did not grow luxuriantly ; indeed, self-sown plants of the native *Elemine agyptiaoa,* which germinated along with *Paspulwn chlatatuti,* grew so much more vigorously that they had to be weeded out, else

the *Pasna*^ ^ould not have survived. After the rains ceased some of the plants dried up and the rest were only kept alive by watering. The Revd. Mr. Campbell, a particularly careful oDserver, who reports this experiment, concludes that ' it does not appear that *Pasnalum dilatatum* is suited for the dry climate of Choia Nagpur.' ^«*p«**»

Burma.—The only report received relates to experimental sowings at Meiktila in May, in 3 and again in July 1901. Not a single seed germinated.

NORTHERN INDIA.— *United Provinces.*—At Cawnpore seed received by the Direstor of Records and Agriculture from the Agricultural and Horticultural Society of India, and in July 1900 did not germinate at all. Seed from the same source s>wn in December was equally unsuccessful. Seed received from the Royal Botanic Garden, sown in

[illegible] failed. The Director obtained some seed direct from the firm of Henderson & Co., New York, which was sown in two instalments. Of »the first sowing, in September 1901, no seed germinated ; from the second sowing, made in November, a few small plants were obtained, which were still alive in February 1902. About 12 per cent. of this seed germinated—7 per cent, well; 5 per cent, feebly. The experiments " did not give any gaod results."

Central Provinces.— Seed received by the Commissioner of Settlements and Agriculture from the Royal Botanic Garden was sown experimentally in the Sironcha Tahsil, both in the government Garden and *in* low land along the river bank, but not a single seed germinated. Seed however that had been received from the Wollongbar Experimental Farm in November [illegible] was sown at the Nagpur Experimental Farm and in the Fuel and Fodder Reserves at Nagpur. which are situated on a low range of barren hills. The seed sown at the farm gave a good yield of fodder grass. That sown in the reserves germinated well, but it dried up at the same time as other local grasses. The quality of the *Paspalum* was superior to that of the native grasses« It appeared that *Paspalum* throve better on black soil than on stony hilly land and the experiment seemed to indicate that *P. dilatatum* does not resist drought but is likely to thrive on the banks of rivers and streams where there is moisture throughout the year (vide Report, Nagpur Experimental Farm, 1900-1901/ paragraph 20).

Rajputana.—Seed sent through the Reporter on Economic Products to Jaipur Raj did not germinate at all' *h°ttgh other plants and seeds got on well at the commencement of the rains which fell, the monsoon ultimately failed, were at first normal.

Was received in quantity of sped was sent to the Director of Farms, Punjab Command. This any germinated at Jullunder, Perozepar, Multan and Djra Ismail Khan. It failed to germinate in

germination test sent to the Superintendent of the Hissar Cattle Farm sown in March 1901 did not germinate at all. A small quantity of the same seed was sown in the garden attached to the office of the Director, Land Records and Agriculture, Punjab, in the same month in land twice ploughed and heavily dressed with farmyard manure before sowing. At first it was feared it would not germinate as the seed remained in the ground for a considerable interval after sowing, but it ultimately came up after receiving four waterings at intervals of a fortnight.

The land on which the seed was sown was of the poor quality known as *Kalrati* (clayey) [illegible] Four plots were set apart for the *Paspalum*, *two* of which were manured and two of them not. On one of the manured plots the grass grew very rapidly, attaining a height of four feet and spreading well. *On* the other plot which was *by* 5 ft. [illegible] germinate at all. One of the unmanured plots which was little affected [illegible] corresponding manured plot; on the other whicli was very [illegible] grass did not grow at all. The roots in both the manured and the unmanured plots [illegible] grass throve, went 10 inches into the sail and took firm hold of the ground. [illegible] excellent fodder. These Lahore experiments "seem to show that the grass [illegible] thrive at all on salty soils, but with care in watering it thrives well in clay soils, if [illegible] very decidedly impregnated with salts."

The Officiating Reporter on Economic Products early in 1901 visited the Government Farm at Allahabad and Cawnpoie and the experimental garden attached to the office of the Director, Land Records and Agriculture, Pan jab, at each of which he saw *Paspalum dilatatum* growing. At Allahabad the grass had been sown right and left of a drain which brings it abundant water and a considerable amount of manurial matter. Where the overflow of the drain reaches it the *Paspalum* is very dense and grows to the exclusion of every thing else ; where the water does not reach it the growth is miserable and apparently very slow.

At the Government Farm, Nawabganj, near Cawnpore, the *Paspalum* had been planted on a Plot where it obtains irrigation. The plants were small and appeared unlikely to cover the ground for a long time. Both at Cawnpore aud at Allahabad it was observed that where the grass was exposed to the sun the shoots of small plants tended very much to lie along the ground so as to the give breadth without depth.

At Lahore the grass was grown under irrigation and partially under shade. It formed a dense and deep bed, but the tussocks did not touch so that there was some loss of space ; suggesting that the most remunerative place for growing the *Paspalum* might be in a grass fixture with other fodder plants to fill the waste corners between the *Paspalum* tussocks.

Mr. Burkill concludes his interesting note by expressing the opinion that in India the grass will not become established uuless it can obtain a large water-supply, and he doubts very

much " if it will be fouml to maintain itself in the drier parts of India, when established, unless irrigated."

WESTERN INDIA.—Seed sent to the Director, Land Records and Agriculture, Bombay, was sown at Dee6a, both on manured and on unmanured ground, but failed to germinate in both cases. The ground was not watered but good rain fell on it a few days after the seed was sown. On the Poona Farm a few seeds germinated, but the plants have not flourished.

SOUTHERN INDIA.—*Coorg.*—Seed sent through the Reporter on Economic Products to Mr. P. G. Tipping, Sidapur, was tiied on a piece of land from which *Lantana* had been cleared, but none came up. In marked contrast to this was the experience with part of the same consignment of seed sent direct to Mr, G. L Newbery, Pollibeta, South Coorg, who planted some seed in virgin soil and some in very barren and dry soil, similar to that of the Mysore plains. Both lots came on very well indeed and throve equally. Some seed was also scattered broadcast in the jungles ; that grew well also. The seed was put out in September 1901, the altitude of the place of experiment being 3,022 feet, the average rainfall 53 inches. No water was applied to encourage growth when the hot weather pet in$_3$ nor did the grass seem to require much water. In North Coorg at a greater elevation and with an average rainfall of 120 inches it was said not to be a success, but in Mysore, 20-30 inches rainfall, it did well. Mr Newbery states that cattle are very fond of the grass and that it seems much hardier than Guinea grass, and is inclined to give a more luxuriant crop during the dry season.

The manager of the Saidapet Farm sowed *Paspalum* seeds received in June 1900 in a small bed ; transplanting half to another plot after two mouths, the remainder alter about a year. The grass did well under irrigation. Tae grass at Saidipet did not appear to possess any advantage over Guinea grass.

The Conservator of Forests, Northern Circle, Madras, furnishes au interesting: *resumé* of the results obtained by the District Forest Officers of Bellary and Gaujam. lu Bellary the seed failed to germinate. In Ganjam seed sown at Chatrapur, in a bed of sandy loam, m July, failed to germinate. Seed SOWD in pots, however, germinated exceedingly well and on the pots becoming crowded with the grass, the plants were put out. The contents of one po^{fc} transplanted into a patch of ordinary indigenous grasses all died; this was supposed to be owing to their not having been watered. Another lot of plants, put out in two beds in the nursery at Chatrapur, and all the plants left in pots throve well. The plants in the beds and pots were watered daily. At Agustinogam, where the rest of the seed sent to Ganjam was sown, the results were as follows :—Seed sown in a bed in the nursery in good soil germinated well. The plants were afterwards transplanted to other beds and produced seeds which when sown also germinated well, and all the plants so obtained have since thriven perfectly. Some seed was sown in a patch uuder Casuarina trees 10 years old, the soil being pure sand with a covering of dead Casuarina twigs. The ground was slightly hoed without removing the dead leaves. The seed germinated well; subsequently the plants were transferred to the nursery beds. Finally, two small patches of pure sea shore sand were enclosed in a fencing of Casuarina branches six feet high so as to protect the plots from the sun. In these plots the seed was sown broadcast and no other soil was added. The seed germinated well, but the plants, with the exception of a few sickly specimens, seemed to die off though they were watered daily* After a considerable interval a certain number of the sickly surviving plants became healthy and quite green so that it is hoped that if, by watering, they survive the hot weather, they may afterwards survive without watering*. The plants form scattered tafts.

The Honorary Secretary, Madras A^ri.-Horticultural Society has very obligingly furnished a report, embodying the experience of several parties to whom the Society forwarded seeds. At Old College Park the grass was by no means a success. The seeds did not germinate for two months and then did so only sparingly. At Oo'acamund the grass proved decidedly valuable at 5,600 feet elevation. The seed was rather difficult to germinate and the same correspondent found some seed, independently obtained by him, a failure. At Virrudupattee tbe seed did not germinate at all. At Adyar the seeds came up but did not mature. Growo in a flower-pot the success was rather greater, but the plant was not a good drought resisting fodder. At Sivaganga the points noticed were (1) that the seed is Jo-ig in germinal ing, (*J that the growth is stunted and poor unless the plant receives as much water as most other fodder grasses require, and*(3) that grown along side of *Pennisetum cenchroides* and under similar conditions, *Paspalum* is much inferior both in facility and in luxuriance of growth. On the Kainia Betta estate, South Coorg, the seed was put down in the dry weather and made very slow progress although watered awd looked after. In the wet Feason a number of plants were put out as Guinea grass is and did well. But it Sfemed doubtful if it had any advantage over Guinea grass or indeed if it were as good. The only point in its favour would be that it should grow during the long dry weather, which Guinea grass will not. But there fas rain in December last in South Coorg, so that it is premature So 6ay what its drought resisting powers may be. At Bangalore half the seed was planted in the open on carefully prepared fenced land. None of this seed germinated, most of the other half of the seed, sown in good soil in flat pans and carefully watered and shaded, germinated but tbe resulting plants grew slowly. They were transplanted during the rains to a piece of ground raised in ridges. Here the *Paspalum* subsequently did fairly well, but it appeared certain that without attention and if left unwatered it must have perished. The conclusion formed at Bangalore is that *Paspalum dilatattiw* has bean greatly over-rated ; that unless carefully attended to it will be unsuited for Iniia as a fodder-grass ; that it is not to be compared for usefulness

with the well-known *Cynodon dactylon,* the *Rarlall* of South India, or *Dub* of North India, which as a fodder-plant in India cannot be equalled and whiuh, if only given a fair chance and not rooted out of the ground, as the custom in India is, during the dry weather, is capable of propagating itself by its widely spreading roots.

At the Agri.-Horticultural Society's Gardens in Madras some of the seed was sown m beds and very carefully attended to, but barely 1 percent, of tha seed germinated. At the same time seed was sown in flat pans. This germinated well an I the plants were treated as ordinary annual seedlings, being first pricked off into pans, three weeks later transferred to 3 inch pots, finally put out into prepired beds and carefully watered. Under this treatment the grass did very well and the plants formed large tufts which were in September 1901 divided up and partly transplanted, the surplus being distributed. Plants left unwatered were of hard and stunted growth. The plants at Madras flowered in November 1901 and seeded freely, but this seed failed to germinate.

In the Annual Report on Government Gardens and Parks in Mysore for 1900-1901, page 10, Mr. J. Cameron refers fully to this grass. Seeds were received from the Madras Agri.-Horticultural Society, from Trivandrum, from the Government Botanist, Melbourne ; some seed was also purchased from the firm of Somner & Co., Melbourne. (The Madras seed came from Calcutta and was of American origin, so that the Mysore experiments were conducted with both American and Australian seed.) Cultivation in the L.il Bagh and the Palace Gardens was encouraging, and seel WILS gathered from the first crop. With manure and irrigation a single crop of^green grass, averaging 12-15 tons per acre, could easily be raised. Such a crop takes 2£ to 3 months to grow. Grown in the rainy season without manure or m-igation, at least half the above out-turn might be expected. The result of leaving the grass to its own resources during th-j dry season had yet to be recorded when the report was written. But with regard to the question of its value Mr. Cameron quotes the guarded statement of Dr. Luehmann, the Government Botanist sA Melbourne, made when presenting a quantity of seed:—" It is no doubt a very useful grass, but whether it will come up to the extravagaut expectations entdrtiined about it may well be doubted."

Thig *resumS\ oi* results so far obtained shows very clearly that there is a great initial difficulty i$_{u}$ getting the seed to germinate. This diffo-ilty has been experienced both with seed of American and of Australian origin, and that it ha* been due to no special defect in the quality of seed imported by the Superintendent of the Royal Botanic Garden is evident «om the experience of the Director of Land Records and Agriculture, United Provinces, and ^{oE} the Superintendent of Government Gardens, Mysore, who obtained also independent supplies of seed from America and Australia, respectively. It is still more evident from the fact that whan treated with special care, as at Calcutta, at Lahore, at Madras, and at bangalore it $_{wag\,go}$*t* to germinate. The seed evidently takes a considerable time to germinate, and is thus, except under special conditions, apt to be a complete failure.^ This discouraging result must not, however, be assumed, by those who have failed, to indicate that the seed supplied them was bad; nor must it be assumed, by those who have succeeded in raising plants to indicate any want of care or undue impatience on the part of those whose results have been negative! The latter may, however, in the hgUt ot the experience here recorded, beenoourao-ed *to* try again. The results obtained by Mr. Newbery in South Coorg, w>»ch ate in striking contrast to those of all the others who have been good enough to ^{su}Pp'r ".formation, really only prove what has been said ; by some happy accident the conditions under whiih the seed supplied to him was sown were those that smted the grass, so that he obtained, without trouble, the results that at Calcutta, Madras, Lahore, and bangalore have only been realised by givinsj special care and attention to the seed.

As regards its drought-resisting qualities everything so far goes to show that^they are, under Indian conditions, of the slightest, and that the outcome of our efforts has meteiy been the introduction to India of a *new* fodder of excellent quality which w.ll thrive well m ^.ons where, and in seasons when, fo lder is plentiful many case. B.tw have not m *Paspthm dilalatum* obtained that ideal plant, whoso, attributes, if conndeied."a™[1]* •)[e] Practically a contradiction in terms;) a fodder that will grow in times of famine and in masons of scarcity.

D< PEAIN,

G. I. C. P. O.-No. 535 R. & A.-1.8-1902.-360.-C. W.

Report of the Director of the Botanical Survey of India for the year 1902-03.

1. *Survey of Eastern India.—The* allotments provided for Botanical Surveys in .Bengal, Assam, and Burma have been expended in full. In Bengal the Director, through the courtesy and with the assistance of the Conservator of Forests, Bengal, was enabled to make a personal tour in the Sundribuns, a forest tract of much interest and value, during the latter part of July and the early part of August 1902, with the result that it was possible to prepare for the .Records of the Botanical Survey an account of the vegetation of the region that, it is hoped, may prove of use to the various officers of Government in charge of it. In Sikkim, collections were made by the Curator, Lloyd Botanic Garden, Darjeeling, and by trained Lepcha collectors. In Chota Nagpur, the Commissioner of the division most kindly supervised the work of a native collector in the Tributary States, with the result that very considerable additions were made to out acquaintance with the vegetation of the region.

In Assam, the services of a native collector were utilized for part of the season in the Assam valley, while during November and Decamber 1902 it was possible, through the kind co-operation of the Superintendent, Lushai Hills, to depute the Assistant Curator of the Royal Botanic Garden to make a botanical collection in the North Lushai Hills, a region regarding which hitherto little was known botanically. In Burma, the Curator of the Calcutta Herbarium was deputed to make a systematic study of the vegetation of Minbu, a district typical of the desert zone in Burma, our knowledge of which has hitherto been very inadequate. During this visit the Curator received much assistance from the local officers at Minbu, and particularly from the Superintendent of Land Records there The services of native collectors were utilized prior to this deputation and as ancillary to this investigation in the districts of Minbu and Myanaung. The results both of the Lushai and Minbu deputations promise to be of great interest.

2. *Survey of Northern India.*— During the early portion of the year the services of native collectors were utilized in providing material for the completion of Mr. Duthie's *Flora of the Tipper Gangetic Plain.*

3. *Survey of Western India.*—The chief botanical survey work of the year was done on the Western Ghats by the officer in charge of the survey and his Herbarium Assistant; native collectors were also sent to various localities in order to obtain material illustrative of particular species dealt with in the *Flora of the Presidency of Bombay.*

4. *Survey of Southern Iniia.*—-The main botanical survey work of the year was done in the Godaveri gorges.

5. *Publications,*—The two parts of *Records of the Botanical Survey of India,* volume II, which were in the press at the close of the preceding year, were issued on 15th August 1902. The first, entitled *Plants of Chutia Nag pur,* by Lieutenant-Colonel J. J. Wood, I.M.S., provides a useful hand-list of the species hitherto reputed for that important province; the second entitled *A note on plants used for food during famines and seasons of scarcity in the Bombay Presidency,* by Mr. G. A. Gamniie, P.L.S., gives a convenient *resume* of all the information available on this subject. A third part, a *Systematic enumeration of the species of Calamus and Dcemonorops,* by Sigaor O. Becoan, is a most valuable guide to the various species of rattans anl canes ; tins was issued on September 27th, 1902. Two other parts were completed and sent to press during the year, but had not been issued at its close. The Director also prepared during the year an account of *Qat, or Arab Tea,* and various other papers.

The *Flora of the Bombay Presidency,* by Dr. T. Cooke, continues to make steady progress, part III, completing volume I having been published. The *Flora of the Upper Gangetic Plain* has also made substantial progress, volume 1 having been completed before the close of the year though its issue had not then taken place.

6. *Economic and Agricultural Botany.*—The continued attention of the Director has been given to economic and agricultural questions. The investigation of the Indian yams has made steady progress, and now approaches completion. It has involved the necessity of asking for assistance and material from Ceylon, Malaya, and China in order to render the results of the enquiry accurate and, as far as possible, complete ; the Director of the Survey and the Reporter on Economic Products, in whose hands this investigation conjointly is, are much indebted for great and readily granted assistance to the Directors ot the Botanical Gardens at Buitenzorg, Peradeniya and Hong-Kong. There appears to be no little confusion in the fibre trade regarding the sources of the fibres vaguely classed as Indian Hemp: the questions that have arisen can only be settled by the cultivation and identification of the plants yielding the various fibres as classified by dealers. This is accordingly being systematically done. A collection of specimens of plants from Africa yielding Indigo are being submitted for report. The examination of these will be taken in hand by the Director on their arrival. In connection with this subject, the Director visited Behar in August 1902, and the Curator of the Herbarium was deputed, in September and October 1902, to investigate along with the Biologist to the Bihar Planter's Association the sources and nature of the Indigo seed supply in Upper India. -Numerous minor economic questions have been dealt vritn during the year. The economic enquiries undertaken in Western and Southern India are fully dealt with by the respective officers in charge, whose reports are submitted in original.

7. *Staff.*—The Director was in charge of his post throughout the year. The Director of the Botanical Department, Northern India, Mr. J. P. Duthie, retired from the service of Government on 31st December 1902, and the post held by him was abolished with effect from that date. The Herbarium of the Department has been placed, *pro tempore,* under a care-taker over whose work the Superintendent, Government Gardens, Saharanpur, exercises a general supervision. The surveys of Western India and of Southern India have been in charge of Messrs. G. A. Gammie and C. A. Barber, respectively, both ot whom have done excellent work.

DAVID PBAIN,

Directory Botanical Survey of India-

Eeport on the Botanical Survey Operations in the Bombay Presidency for the year 1902-03, *by G.* A. Gammie, F.L.S., Officer *in* charge of the Botanical Survey, Bombay Presidency.

I held charge of the office of the Botanical Survey, Bombay Presidency, throughout the year.

1. *Tours.*—During the hot weather vacation Mr. Bhide and I travelled over parts of Belgaum, Sawantvadi and itatoagiri. In the cold weather vacation Mr. Bhide botanized from Poona to Poorandhar; to Jeur in the Sholapur District; and also from Wathar to Mahableshwar and Pertabgarh during which journey he found a fine new species which Dr. Cooke has described as *Kalanchce Bhidoi.* At the same time I refcraversed parts of the Poona Ghats, Bhor State, Kolaba, and Thana Districts. Besides these journeys some minor ones for definite objects were undertaken by the plant collectors alone. I paid several visits to the Sisal plantation at Nandgaon and devoted much time to botanical investigations on the Poona and Manjri farms.

2. *Herbarium.*—As I mentioned in the last report, the Herbarium with its contents, was completely destroyed by fire on the 1st May 1902. Since then the building and fittings have been reconstructed, and it will be seen from the detailed list of specimens incorporated that no pains have been spared in the attempt to restore the Herbarium to its former high standard. I have to thank the following gentlemen for the assistance they have afforded me. Dr. T. Cooke, who presented the specimens forming his own Herbarium up to the end of Liguminosse. He has generously promised to present the remainder of his Herbarium as his work on the Flora of Bombay progress. His collection is invaluable because it is named in accordance with his book.

Mr. G. M. B/yan, Deputy Conservator of Forests, Central Thana, has sent* and still continues to send, valuable sets of plants from his district. The accompanying notes are of great value, and we purpose issuing a record of the whole when completed. The Superintendent, Victoria Gardens, Bombay, has kindly sent a large set of specimens which replace many that were lost.

Mr. Woodrow sent a set of the rarer grasses and sedges which is of the utmost value to the Herbarium. Lieutenant-Colonel Jencken, R.A.M.C., was good enough to give us a small set of Mlgiri specimens, and Mr. V. B.. Damle sent interesting plants from Kolaba.

The following is the year's record of specimens incorporated in the Herbarium:—

Specimens collected by Mr. G. A. Gammie	5,806	sheets.
„ „ R.K. Bhide	1,568	„
„ „ L. D. Garade	2,680	„
„ „ „ „	47	„
„ presented „ „ V. R. Damle	2,891	„
„ „ „ Dr. T. Cooke	110	„
„ Herbarium, Botanic Garden, Calcutta	553	„
„ presented by Mr. G. M. Ryan	157	„
„ G. M. Woodrow	22	„
„ Lieutenant-Colonel Jencken	398	„
„ Superintendent, Victoria Garden, Bombay		
TOTAL	14,182	„

3. *Publications.*—A note'on the Plants used during famine and times of scarcity was published as a contribution to the Records of the Botanical Survey of India. A botanical account of the Indian wheats grown at the Poona and Manjri farms was despatched to the Inspector General of Agriculture in India, and a similar account of the cottons is almost ready.

4. Owing to the loss of my records I was unable to complete the reference to *Catha edulis,* but, by the kindness of the Director of Land Records and Agriculture, I am now able to do so from fresh copies of the correspondence on

the subject. As so little is known of the plant in India, to obtain fuller information, I drew out the following list, of questions which were answered by the courtesy of the Political Resident, Aden:—

1. Where is it grown and how ?

It is grown on the mountains of Yemen. It is brought to Aden from the Turkish District Makatra, situate to the north and west of the Subaihai country under British protection.

2. What are its requirements as regards climate and soil ?

Where coffee grows the plant will thrive. Some years ago good coffee berries from Yemen were sent from Aden to the Victoria Gardens, Bombay, where the plants are thriving well and some coffee is collected from them.

3. If it is a cultivated plant, where did it originate ?

It is not known where the plant originated.

4. Is the plant subjected to any particular cultural treatment ?

It is planted from cuttings, and after it takes root it is transplanted once or twice and then finally planted in the places required. I* is said that it grows like the Indian tamarind tree. As often as the leaves sprout the plant is trimmed. The tender twigs with leaves are cut as the plant grows.

5. How often are the leaves collected in a year, and are old or young leaves made use of ?

The tender twigs with leaves are cut as often as required and the rest allowed to grow to a tree. Only young leaves are made use of.

6. What is the process of manufacture ?

There is no process of manufacture. The fresh leaves are chewed and are said to produce great hilarity of spirit.

7. How is it prepared or packed for export ?

Small bundles are made consisting of about 30 or 40 twigs, which are wrapped up in twigs and leaves of the kât tree or other plants.

8. Whence is it shipped or transported ?

It is imported from places near Aden and sold here.

It is also exported to ports on the Arabian and African coasts.

9. How is it used for drinking ?

It is not used for drinking sinca the use of coffee has become general.

An excellent account of kât, which is often quoted, is published in the historical account of Aden, by Captain F. M. Hunter. On sending samples of kât to Mr. D. Hooper, the Curator of the Economic and Art Section, Indian Museum, Calcutta, that gentleman generously furnished me with the following particulars :—" Albert Beither finds that the previously described alkaloid *katine* is associated with a new caoutchouc substance C_{10} H_{17} O, which softens at 50°C, and melts at 120°C. Traces of a volatile oil lighter than water, which darkens on keeping, ultimately depositing crystals and has a powerful odour, were also obtained. The alkaloid is present in only a very small quantity. The leaves from Aden yielding only 0'076 per cent., while those from Harrar yielded only half as much. It is purified with difficulty and gives precipitates with the usual alkaloidal reagents, but only when present in fairly strong solution. (Arch, de Pharm 239, Feb. 8, 1901.)"

5. *Sisal Hemp.—The* 11 plants, which flowered the previous year, produced nearly 20,000 bulbils, of which over 12,000 were despatched to the Divisional Forest Officer, Nasik, and the remainder were distributed to various applicants [illegible] and they have produced 38,800 bulbils,

The plants put out in the Botanic Garden, Ganeshkhind, made fair progress, and those at the experimental plot at *Nandgaon* are also *in* a thriving condition.

6. *Sabai grass.*—.No application for seed was received during the year. The Managing Agents of the Reay Paper Mills have decided to grow the plants without irrigation, so that now the plant only yields one crop per annum. On irrigated land the difficulty regarding the flower-stalks appears to be insurmountable.

The plants of *Esparto* (Stipa tenacissima) remained small and never recovered from the effects of the hot weather. The plant is thus manifestly unsuitable for cultivation at Poona.

7. *Economic work.*—The examination of the wheat and cotton varieties was continued. During the present year I hope to come to some definite conclusion regarding the classification of the *Jbwars* and some minor crops. Two interesting discoveries among the latter were a peculiar form of *Múg* (Phaseolus Mungo *Linn.)* from Guzerat and a luxuriant form of *Panioum ramosum* Iiinn., which is cultivated as a cereal in one taluka of Ahmednagar.

I have to thank Mr. R. K. Bhide for his cheerful assistance in the Herbarium and field. Mr. L. D. Garade, who succeeded the late Mr. Madane as Head Plant Collector, took entire charge of the preparation of the very large number of specimens and by the exercise of unremitting industry, he avoided any accumulation of arrears. Mr. Ii. Khomne has taken up the duties of Second Plant Collector which he has performed to my eutire satisfaction.

GEORGE A. GAMMIE,

In charge of the Botanical Survey of the Bombay Presidency.

POONA;

The 2nd July 1903.

Annual Report of the Government Botanist, Madras.

I have the honour to forward the following report of the work of my office during the year 1902-03.

2. Owing to the transfer of my head-quarters to Madras the ordinary course of touring was considerably interfered with. The following were the chief places visited:—

Ootacamund.—This was my head-office until 1st July and some two months were spent there in arranging the collections for the transfer.

Madras.—After 1st July my office was located in the Board's buildings at Chepauk. For reasons given below, only two months of the remaining nine were spent in Madras, the rest being devoted to travelling.

Samalkot.—Nine visits were made during the year to the experimental sugar station. The longest of these was for the; month of March during which the crop was reaped.

Coorg.—The first half of June was spent, chiefly at Praserpet, in the investigation of the sandalwood disease known as " spike."

Kistna District. —A general agricultural tour was made through the dry taluks of this district, from the end of September to the beginning of November.

Godavari gorges.—A plant-collacting tour was made up the river during the latter part of November and the first half of December.

South Wynaad.—A fortnight in January was devoted to a tour through the planting districts of the Wynaad, most of the time being spent in the investigation of the pepper disease,

3. An important change was made during the year in the work of the Government Botanist. By G. O., No. 292, Revenue, dated 25th March 1902, he was transferred to the Agricultural Department and his work became mainly economic. As a consequence of this, his office was moved from Ootacamund to Madras. The collections were safely transmitted at the end of June. The rooms in the Board's offices are ill-suited for microscopic and general laboratory work, and, pending the erection of suitable quarters, the Government Botanist found it advisable to spend a considerable part of the year on tour.

4. The only tour devoted definitely to the botanical survey was the short one in the Godavari gorges. The dry flora along the banks of the river were carefully collected, and a number of species were also obtained on a five days' trip among the evergreen forests of the Eastern Ghats near Bison Hill.

Besides this main tour, smaller collections were made in the Kistna District, in Coorg, around Coonoor and Ootacamund, at Gudalur, in the Wynaad and down the Tambracherry ghat. No great effort was, however, made to increase the collections, since the preparing work was completely disorganised by the removal of the herbarium.

5. A commencement was made towards collecting a fungus flora of the Presidency, the Cryptogamic Botanist to the Government of India having expressed*a desire for Madras specimens. Thirty-two collections were made and forwarded to Dehra Dun during the year.

6. Among the numerous specimens received for identification, five parcels of grasses were sent in by different Forest officers. The work of naming these is proceeding, but little progress has been made in this direction because of other work. About 130 sheets of grasses have been named during the year and 500 more await attention.

A collection of 10& sheets of plants was received from Calcutta, but, owing to press of work, no'ie have been sent in return. About 250 sheets have, however, been prepared for this purpose and will be forwarded as soon as they can be dealt with.

7. On the initiative of the Officiating Reporter on Economic Products to the Government of India, considerable attention has been paid to the different

varieties of sorghum grown in the Presidency. Altogether 94 sets of sorghum heads have passed through the office for transmission to Calcutta, duplicates being retained in all cases for future reference.

8. The Superintendent of the Royal Botanical Gardens in Calcutta and the Reporter on Economic Products having decided to work up the varieties of yams, wild and cultivated, throughout India, the somewhat delicate task of forwarding living specimens of the tubers for growth in the Calcutta gardens devolved on this office. Eifty baskets of these have been despatched during the year. The importance of having such sendings passed through a Central office may be gathered from the fact that many have had to be rejected be'cause of small size, decay *en route,* or because they were not yams at all but tuberous plants of other orders.

9. An attempt has been made to collect infor^nation regarding th3 wild indigos of the Madras Presidency. It is supposed that among these there is one at least of great economic value, and the search has been commenced for it. A number of plants have already been received in this office, but, since their state of preservation on arrival has been almost uniformly bad, little progress has been made in the enquiry. Such indigos as the Government Botanist was able to collect on tour have been carefully examined and sent for checking to the Superintendent of the Royal Gardens in Calcutta, and several interesting species have been found among them. The cultivated forms so far collected have been uniformly referred to *Indigofera sumatrana,* and not to *Indigofera tinctoHa* as had been supposed.

10. The sandalwood plantations of Mysore and Coorg have recently developed a new and alarming disease called "spike." In this the plant slowly or rapidly alters the character of its foliage, the leaves becoming smaller and less numerous as the disease advances. Ultimately the affected plant dies out altogether. Large areas where the sandalwood was formerly abundant are now completely devoid of these trees, the disease having made a clean sweep of them. The sandalwood of commerce is entirely collected from dead trees. While therefore the visible supply is not likely to decrease during the next few years and •might indeed be greatly increased with little difficulty, there is some prospect of this profitable source of revenue being lost to the State. Considering the importance of the product, the Government Botanist was lent to the Government of India to examine the plants *in situ.* No trace of any parasite was found in the tissues, but a number of interesting facts were brought to light in the investigation, the report on which was reproduced in the *Indian Forester.*

11. A fortnight was devoted to an examination of the pepper plantations of the South Wynaad. After some years of phenomenal success, many of the vines are seen to be dying out. A number of diseases were met with, but there was no *one* which was universally found. The plants were extremely liable to cankerous growths, and in some cases severe attacks of eelworms on the roots were met with. In certain vines a hyphal infestation was found throughout the vessels in the fibrovascular bundles, but the presence of this fungus did not appear to have any relation to the relative " sickness " of the vines. A preliminary report was issued and the investigation postponed until the Government Botanist should have the opportunity of examining the plants during the dry weather.

12. The cockchafers of the Nilgiris continued to receive attention, although the completion of the work was interfered with by the removal of the Government Botanist's office to Madras.

13. By far the most important economic work of the year was that in connection with the Samalkot experimental sugar station. The complete management of this passed into the Government Botanist's hands on 28th April, and throughout the year its affairs have occupied much of his time.

In spite of the hurried manner in which the land was acquired, and the lateness of the time of planting, the year's work may be considered generally as successful. A change was unfortunately necessary in the Agricultural Inspector in charge, and the land proved in most cases to be in very poor physical condition, but the growth of the canes was, on the whole, satisfactory. Some of the fourteen varieties showed remarkable growth, and the results obtained from the

" methods " plots were interesting. The manurial plots were, on the other hand, of little value, in that the physical condition of the soil was quite unfit for this line of work. A second large piece has been taken up, a number of varieties have been added to the station, the manurial experiments have been simplified, while the different methods of growing the cane have received far greater attention. At the close of the official year the whole station was planted up, and over 100 experiments were being carried out in sixty separate plots. The work of reaping the crop and planting the station up was very heavy, and the bulk *01* the office staff were employed during the month of March*in the necessary counting and weighing operations. The varieties grown were analysed through the kindness of Messrs. Parry & Co. at the Deccan Factory. As was perhaps to be expected at first, the local varieties proved to be superior to those introduced from Bombay and elsewhere. The unoccupied land was laid out in paddy of which several varieties were tried. At the instance of the Deputy Director of Agriculture the short " two-months " paddy of the Tanjore District was success-* fully introduced and the seed sold to the ryots.

14. A short visit was paid to the sugarcane experimental garden at Vizianagram. Here a number of Mauritius canes have been grown for several years in "comparative isolation. These were inspected, and the planting for the current year was superintended by the Agricultural Inspector stationed at Samalkot. By the kindness of the authorities nine of the varieties were planted at Samalkot and subjected to a preliminary analysis, forming a valuable addition to our set of varieties there. It is proposed to pay occasional visits during the year to this interesting little garden.

15. An important innovation in the usual touring arrangements was made, in that a tract of country w is selected for detailed agricultural examination. The Government Botanist toured for about six weeks through the upland taluks of the Kistna District, studied the crops and modes of cultivation and collected examples of the various pests.

The chief crop^ thus submitted to detailed study were indigo, chillies, cotton, cholam, maize, tobacco, dry paddy, sazza, korra, white variga, the various grams and other crops were also noted where met with. It is proposed to devote one tour each year to the study of the crops of a district in this manner.

Among the many fungus and insect pests collected during this tour, perhaps the most interesting was a CoUetotrichum so closely allied to the existing species attacking the sugarcane that it was not possible to distinguish the two under the microscope. It was abundant on dying cholam leaves and appeared to be saprophytic. It is probably widely distributed, and, if so, attempts to stamp out the sugarcane disease must take the proximity of cholam into account. The matter has been referred to the Cryptogamic Botanist to the Government of India. Most of the remaining pests have been merely " recorded " in the offi[ce] collections until such time as may allow of their being worked out in detail.

16. During the year under review the following additions were made to the office staff. An entomological assistant, an artist, an additional plant-collector and an extra peon. These officers, who joined at the commencement of March, were employed during that month at the Samalkot sugar station, the artist making careful paintings of all the varieties of sugarcane grown.

17. No useful purpose would be served by giving references to the many minor matters which have engaged the Government Botanist's attention during the year. Suffice it to say that the number of subjects brought before him was far in excess of what could be properly dealt with, and the wideness of the field of study has never been more keenly felt than during.the period under review-

Appendix to Botanical Survey of India Report for 1902-03.

P ASP ALUM DILATATUM, *Pair.*

A number of reports on the cultivation of this grass having been courteously forwarded by various correspondents during the year 1902-03, a *return** of the further experience thus recorded is given in continuation of the appendix to the Annual Report of the Botanical Survey for 1901-02.

The seed supplied for these experiments, it should be premised, was obtained from Australia in two consignments, one packed in a bag, the other in a zinc-lined case.

Punjab,—Seed sown on the military grass farms at Umballa and Mian Mir failed to germinate at either place.

Burma.—Seed of both kinds sowsi at Mandalay were equally a failure although the Deputy Commissioner made several attempts to raise them. Seed sown in the open .did not even germinate.

United Provinces.—Both kinds, of seeds were tiied both in the rains and in the cold season* but failed to give anything like satisfactory germination. Some seed received from America* after several trials and wilh great care aad attention, germinated on one plot at Cawnpur. By frequent waterings it was kept in existence for two years, but never produced any fodder worth considering. The Deputy Director of Land Records who supplies the information gives it as his opinion, without hesitation, that as a fodder for the United Provinces *Paspahim dilatatum* is worthless.

Bombay.—The Inspector General of Supply and Transport, Bombay Command, reports regarding the experimental cultivation of *Paspalum* in the Mhow and Deesa Commands.

The seed sown both at Deesa and at Ahmadabad failed to germinate. Tea pounds of seed imported from Australia by the General Officer commanding t\\d Mhow District gave very-good results. At Mhow this seed germinated thoroughly when watered by hand labour. Though the seed was sown late in the stason owing to the late monsoon the crop was fit for cutting by the middle of September, but was left in order to obtain seed for further propagation. The crop was covered with old choppad broiren hay to protect it from the scorching heat of the sun and by this means was ktpt green without any watering. This, the General Officer Commanding the Mhow District add?,*iC* undoubtedly proves that it is one of the most drought-resisting gras-es." The Supply and Transport Officer, Nasirabad, reports that seed sown ia manured and iirigated ground germinated well, but saed sown in unirrigated and unmanured land did not germinate at all. Growth was fair but irregular, a good deal of the grass dying off and leaving the field patchy. The grass was cut and issued green during September, an average period of 80 days ; under better conditions it would have been ready for cutting some days earlier.

The officer of the battery to whi^h it wa3 issued thought well of it as a fodder. The yield was equal to 5,8b2 lbs. green grass, or 3,000 lb?. hay per acre, the usual rate of hay for Nasirabal being 1,000 lbs. per acre. This officer farther reports the experience of others *in* Nasirabad with *Paspalum.* In 1901 some seed received by the Cantonment Magistrate was sown *(a)* in his own garden, *(b)* by the Missicto, and *(c)* in°the Commissariat garden. The sowings *(b)* and *(c)* were failures, the seed not germinating. The sowing by the Cantonment Magistrate himself was a success, three crops having been cut from the grass during the rains and colcf weather. The roots were subsequently given by the Cantonment Magistrate to the Suppl. and Transport Officer who planted them on posr soil, lightly manured but liberally wateredy 'J he glass grew vigorously and was cut in the beginning of October to save the seed which was ready for collection though the grass itself was still green. The interest of this experiment lay in its showing that the grass of the second year was of more vigorous growth, and much richer in colour, than the grass raisel from new seed. Whether this was due to acclimatisation or to the soil (kunkur)'being more suitable was not clear. The outturn in this experiment was equal to 7,616 lbs. of green grass per acre.

Another officer at Nasirabad imported fresh seed and put it down in his compound ; the land was softened by ploughing but was aot manured. Though watered, very little of the seed germinated and the plants withered very soon.

On the Military Dairy Farm the seed completely failed to germinate.

The conclusion come to by the Supply and Transport Officer, Nasirabad, on these experiments deserves to be given in full. " From these trials," he says, " it appears that the seed when freshly imported will not alvyays germinate if either too wet or too dry, and that there is a large percentage of failure in what does germinate; that acclimatised roots can be transplanted and do°well, none failing if sufficiently watered; also,, that the crop is better in quality and heavier in the second year."

*Andaman**.—A report has been forwarded by the Superintendent of Port Blair embodying the opinion of the Executive Commissariat Officer there, who reports that, although the seed sown in 1901 had germinated, the result was disappointing, the grass only reaching a height of

12 to 18 inches, and being of poor quality. Cattle fed with it did not appear to eat it with the same relish as they did guinea grass. The seed sown in 1902 is reported as having failed to germinate at all.

Madras.—The Conservator of Forests, Northern Circle, has forwarded a note on the experiments made with the seed of 1902. In Ganjam the seed was sown under various conditions but except some 20 seedlings in a flower-pot none germinated. In Godavari the seed was sown in four beds, soil similar in all, but two in shade, two in the open. After 3 days' coast*cutiye rain the seed was sown; that in the beds in shade germinated, that in the beds in the open did not germinate at all. The growth was good, the maximum height being 3 feet; flowering took place in September and seed was collected during October and November, In Kistna there seemed to be no difference between the seed that had come in a bag and that received in a zinc-lined case, both kinds germinating equally well. Most of the seed v\ as sown in July i[11] raised beds of sandy soil which had been manured. Germination commenced in 5 days and continued for a month, a large percentage germinating. Some seed sown in unprepared beds of sand germinated poorly, some of the seeds germinating as late as in December 1902. The grass in the better soil flowered towards the end of August; the growth was luxuriant and yield of seed fair. In the beds of nearly pure sand the growth was poor and flowering meagre. All the beds were steadily watered. Half of the prepared beds were in the open, In If under shade; the germination in the shaded half was rather more plentiful, the maximum height was 30 inches. In the unprepared beds the growth was insignificant, the plants spreading along' the ground. Some seed was sown on ordinary soil in Khanakhallu reserve on 28th August lb0&. On 22nd November about 16 plants only were found growing spread along the ground, eo that the germination here had been poor. In Bellary the beds for sowing were made under shade, the soil well worked but not manured. Of the four beds, two were inside the nursery, here the seed received in a zinc-lined case was sown; two were outside the nursery and in these the other seed was sown. The seed germinated in all, but the seed received in the zinc-lined case did so more vigorously and profusely. The plants of both kinds subsequently grew well. I[n] Anantapur both kinds of seed were sown broadcast in the District Forest Officer's Bungalow Compound. Both kinds germinated equally well, about 30 per cent, in each case. Seed sown in two beds ia inferior toil and in a more exposed position almost failed to germinate at all, though the few plants that did appear have done well. In the Uppar ipalli reserve two beds were sown broadcast in the open, and here again about 30 per cent, of each kind of sped germinated, the plants subsequently growing vigorously. No appreciable difference has been observed between the plants raised from the two sets of seeds except those from the seed received in a bag appeared to be greener than the others. In forwarding these reports the Conservator of Forests, Northern Circle, remarks : " I understood that *the* great feature about . this grass was that it could withstand drought and do without watering, but this does not appear to be the case at all, and in fact the whole experiment seems to be a very doubtful success."

Bengal.—The Commissioner of Chota Nagpur reports that some of the seed sent to him was sown in a box, the rest in two beds in the open, one bed in shade, the other not in shade. The seeds in the open germinated very poorly, in the box very fairly. The seedlings in the box were transplanted, some to a bed under shade, the rest to a bed in the open. Up to the end of December the four beds were regularly watered, otherwise the plants would not have lived. After the beginning of January the plants were not watered but at the beginning of May 1903, they were still healthy enough except in one of the plots in the open where very few remained alive. The Commissicner, who took great pains over the experiment, concludes his report as follows : " Personally I think that the trouble and the watering needed to keep the plants alive during the past year, make the grass quite unsuitable for this Division/' I[n] the Royal Botanic Garden at Shibpur, where the conditions are those typical of the Lower Gangetic Plain, no attention was bestowed on the grass as regards its cultivation, because none was uecessary. It yielded a very large supply of excellent fodder, which was used to feed the garden cattle who ate it readily, and it afforded an abundant supply of seed. Many stray tussocks are now appearing spontaneously at considerable distances from the plots in which i* was originally sown. The quantity of green fodder yielded was much greater than it was during 1901-02, and the growth of the plants during the past year has been more vigorous- The species is in fact satisfactorily established. But while this is the case it will be seen from this year's reports on the subject that the conclusion hazarded last year has been amply confirmed. The attempt to introduce *Faspalum dilatatum* has provided India with a new fodder grass of good quality, though not superior to many of the fodders already in use, but it has npt supplied the country with a fodder that will thrive in seasons of scarcity and drought. It wiU not, I believe, be necessary to report further on this particular species.

D. PRAIN.

G. I. C. P, O.—No. 794. R. & A.—29-7-1903.- 360.—J.N. S..

REPORT OF THE DIRECTOR OF THE BOTANICAL SURVEY OF INDIA FOR THE YEAR 1903-04.

1. *Survey of Eastern India.—The* allotments provided for Botanical Surveys in Bengal, Assam and Burma, were expended in full. On the North-Eastern frontier the Superintendent was enabled to undertake a visit to Independent Sikkim and Tibet, in order to organise Botanical Survey operations in the latter country in connection with a frontier mission. The results of this visit which was paid by the invitation of the Political Officer in charge of the mission and with the sanction of Government have been most satisfactory. The Curator of the Calcutta Herbarium was deputed to Assam to make a systematic survey of the district of Cachar with the object of linking up the results of investigations recently made in the Lushai country with results previously obtained during the exploration of the hill tracts of Assam by various explorers. This deputation gave very satisfactory results but more exploration work remains to be done both in Cachar and in the Lushai country before it is possible to give a connected account of the botanical features of the region lying between the Barak and the Irrawady valleys. In Burma use was made of the agency of native collectors, while in Tenasserim the co-operation of the Forest Department has led to the communication of a number of valuable specimens.

2. *Survey of Western India*—In* the course of tha year the officer in charge of this survey botanized, during his hot weather vacation from duties at the College of Science, along th6 Poona Ghâts, over part of the Thana District, around the Kanher i caves and on the hills near Matheran. His cold weather vacation was utilised in investigating the Katraj Ghât and in exploring parts of the Guzerat and Khandesh Districts.

3. *Survey of Southern India.*—The principal systematic surrey work of the year was done in the Anamalai forests by the Government Botcanist and an Assistant. Similar work was also undertaken in the coffee zone of the Mysore forests. Collections were also made during the course of agricultural and economic tours in Malabar, on the Mysore GhS,ts and in the Coimbatore district.

4 *Publications.—The* chief publications issued during the year have been a monograph of the species of Dalbergia of South-Eastern Asia, an account of the Flora of the Sundribuns, and various minor notes and papers by the Director of the Survey; a census of the Indian *Polygonum* by the Curator of the Calcutta Herbarium, published in the Records of the Survey; part I of the first volume of a Flora of the Upper Gangetic Plain by the officer lately in charge of the Botanical Survey of Northern India was issued; a botanical account of the Indian Cottons was prepared, for issue by the Agricultural Department, by the officer in charge of the Botanical Survey of Western India, and part I of the second volume of the Flora of the Bqpabay Presidency by an officer formerly in charge of this survey was completed. The officer in charge of the Botanical Survey of Southern India has published a memorandum on the pressing, preservation and despatch of specimens^ a note on the experimental sugarcane cultivation at Samalkata; an account of the diseases of Andropogon Sorghum in the Madras. Presidency; two reports on the Wynaad Pepper plantations,

5. *Economic and Agricultural Botany.*—The continued attention of the various officers of the survey has been given to economic and agricultural questions. During the year the Director made several tours of inspection on behalf of the Agricultural Department in connection with enquiries into the cultivation of Cotton, of Indian Hemp, of Agave and of Jute in Northern India; the officer in charge of the Botanical Survey of Western India visited the Sisal plantations at Nandgaon and devoted much time to botanical investigation at the Poona and Manjri farms; the officer in charge of the Botanical Survey of Southern India devoted much time and attention to the management and study of experiments on the Samalkota Sugarcane farm; to the study of the pepper crop in the Wynaad and in Malabar, and to an investigation of the crops of the Coimbatore district.

The Director examined and reported on a large series of specimens of plants from Africa yielding Indigo, sent for investigation through the Secretary of State for India by the Colonial Office. The enquiry into the sources of Indian Hemp fibre made steady progress. Seeds received from parties interested in the trade in this article from places so remote as Coconada, Central India, the United Provinces and Lower Bengal, Were cultivated experimentally with the result that the fibre was shown in each case to be the product of the same plant, *Crotalaria juncea.* Grown as the plants were side by side, under the same conditions as to cultivation and with identical treatment as regards the extraction of their fibre the difiFerence in value in their products practically disappeared. The fibres from the plants that yielded the seeds vary in valu$_e$ in the trade, according to locality of origin, from £9 to £18 per ton. Yet as grown in Calcutta, the greatest variation experienced was of only £2 per ton ^{a}nd it was reported from London that all the fibres submitted for valuation could have been sold under the same mark. The experiments are to be reported on a more comprehensive scale so as to put the results on a wider and firmer basis. The interest taken by the public in other plants yielding useful fibres has continued to be great and in connection with this it has been found necessary to institute a sustained enquiry, with the co-operation of officers in charge of public gardens throughout India and with the aid of other Government officials and private planters, into the identity and distribution of the various *Agaves* and *Furcroeas* that are naturalised in different parts of India. Among those who have chiefly aided the Director in this enquiry may be specially mentioned the Superintendent of the Botanic Garden, Saharanpur, and J. B* Drummond, Esq., I.C.S., who has given close attention for sometime to this extremely intricate and very important problem. It is too soon yet to say how many different Agaves have really become naturalised in India; to state precisely the areas to which such .is limited; or to enumerate the characters by which they may most certainly be distinguished. The differences in their value as fibre-producing species are, however, in some cases marked and sufficient information has been obtained to show that considerable caution must be exercised by those desirous of laying down extensive plantations of local *Agaves.* Anotetm the subject is under preparation, which is intended to serve a double purpose ; to make conveniently available all the information that it has so far been possible to obtain and to direct the attention of those interested in this subject to the points that are still in debate, in the hopo of thereby inducing those in a position to do so, to help the officers of the survey in rendering the investigation accurate and complete. The enquiry into the characters and distribution of the various Indian Yams on which the Director

of the Survey and the Reporter on Economic Proiucts have been for some seasons steadily engaged is making satisfactory progress. The enquiry, as has already been explained, is one of peculiar diffi3ulty and has involved the experimental cultivation of much material from all parts of the Empire and from adjacent countries. The cultivation of living plants from tubers, bulbs, cuttings and seeds, for the purpose of identifying the sources of economic articles on behalf of the Reporter on Economic Products, has gone on as usual, the number planted or sown during the year exceeding 6,000. The economic and agricultural enquiries undertaken in Western and Southern India during the year are fully dealt with by the respective officers in charge, whose reports are submitted in original.

6. *Staff.*—The Director of the Botanical Survey was in charge of his post throughout the year. The work of the Botanical Survey of Northern India has been in abeyance throughout the year. The survey work of Western India was in charge of Mr. G. A. Gammie till 19th March 1904 on which date that officer, whose work has been of the usual high quality, availed himself of six months' leave to England, his duties being entrusted to Mr, R. K. Bhide by whom the report of the Western India branch of the survey is submitted. The work of the Botanical Survey of Southern India has been throughout the year in the charge of Mr. 0. A. Barber and has been performed with great care and ability.

DAVID PRAIN,
Director, Botanical Survey of India.

REPORT ON TBE BOTANICAL SURVEY OPERATIONS IN THE BOMBAY PRESIDENCY FOR THE YEAR 1903-04 BY K, K, BHIDE,; OFFICER IN CHARGE OF THE BOTANICAL SURVEY OF BOMBAY PRESIDENCY.

Professor G. A. Gammie, F.L.S., Officer in charge of the Botanical Survey of Bombay Presidency, having gone home to England on leave of six months, at the close of the year under report, I was given charge of his office on the 19th March 1904.

1. *Tours.*—During the hot weather vacation Mr. Gammie botanised along the Poona Ghâts and part of the Thana District around the Kanheri caves, and the hills near Matherau. He also paid a visit to the Sisal Plantation at Nandgaon and devoted much time to botanical investigation at the Poona and Maujri farms. I botanised near tbe Kanheri caves again and Mr. L. D. Garade, the Plant Collector, re-traversed the Poona Ghats later in the rains. An the cold weather vacation Mr. Gammie botanised Katraj Ghât and travelled over parts of toe Guzerat and Khandesh Districts. The Plant Collectors also made s >me interesting collections in the Thana District. Owing to ill-health I could not go out on any long journey daring the year.

2. *The Herbarium.—The* Botanical Survey Dspartment of this Presidency is greatly indebted to the following gentlemen for the valuable specimens they have presented to the herbarium:—

Dr. T. Cooke, who presented the specimens forming his own herbarium up to the end of Rubiacese. He has also promised the remainder of his herbarium as his woi'k on the Flora of Bombay progresses. As mentioned in the last report, his collection is invaluable as it is named in accordance with his book.

Mr. G. M. Ryan, Deputy Conservator of Forests, Central Thana, who continues to send valuable specimens from his district accompanied by notes which are of equally great value.

Mr. Woodrow, who still takes an interest in the herbarium and has presented some very valuable specimens of mosses collected in Great Britain.

The Superintendent of Victoria Gardens, B >mbay, and Empress Gardens, Poona, who send miscellaneous specimens of garden plants from time to time.

The following is the record of specimens incorporated in the Herbarium :—

	Sheets.
Specimens collected by Mr. G. A. Gammie	1,351
„ „ „ R. K. bhide	173
„ „ „ L. D. Garade	597
„ presented by Dr. T. Cooke	1,194
„ „ Mr. G. M. Ryan	1,460
„ „ „ G. M. Woodrow	307
„ „ Superintendent, Victoria Gaidene, Bombay	8
„ „ „ Empress » Poona	10
„ „ „ Royal Botanic Garden, Calcutta	791
Total	5,791

The following is the number of specimens distributed :—

Specimens sent to the Principal, Fergusson College, Poona	473
» » » Veterinary „ Bombay	68
Total	546

3. *Publications.*—A botanical account of the Indian cottons was despatched *to* the Inspector General of Agriculture in India, by Mr. Gammie. Volume I, Pact IH of Dr. Cookers Flora of the Presidency of Bombay was published.

4*. *Sisal Hemp**—Eight plants flowered during the year and they have produced 16,300 bulbils.

The following bulbils were despatched to the Sub-Divisional Officer, Ekruk Tank, Sholapur, and the Forest Officer, Kolhapur :—

Bulbils despatched to the Sub-Divisional Officer, Sholapar	5,000
„ „ „ Forest Officer, Kolhapur.	1,000
Total bulbils	6,000

The plants put out in tbe Ganeshkhind Botanical Garden as well as those at the experimental plot at Nandgaon are making fair progress.

5. *Sabai Grass.*—No application for seeds was received during the year. The Managing Agents of the Heay Paper Mills, Mundwa, Poona, are now growing this grass successfully as a commercial venture and this Department has now plants only sufficient to supply applicants with seeds. I have to thank Mr. L. D. Garade, Plant Collector, who knows many Bombay plants by their vernacular names and who is thus very useful at times in identifying specimens. He had entire charge of the preparation of specimens in addition to his duties and on the whole he has done his work satisfactorily. Mi. L. R. Khomne, the second Plant Collector, has been doing his woJk fairly well, and with some experience he wilt also prove to be a good Plant Collector.

R. K. BHIDE,
Acting Professor of Botany and Agriculture,
College of Science, Poona,
in charge Botanical Survey of Bombay Presidency.

OLLEGB OF SCIENCE, POONA:
The 4th July 1904.

ANNUAL REPOBT OF THE GOVERNMENT BOTANIST, MADRAS.

I have the honour to present the following report of work done in my office during the year 1903-04.

2. There has been a very great increase in the number of subjects dealt with, especially in connection with Economic Botany, and it has been found impossible to refer to all individually in the space assigned for this report. The working rooaa at our disposal has remained unchanged. This has proved so inadequate that active collecting has been largely in abeyance, and the time of the staff has been devoted to the attempt to keep the existing collections in a proper condition. In spite of all our efforts, a number of specimens have been destroyed by dust and damp, by rats and insects. The actual investigating work has been conducted under the greatest disadvantages as regards light and space, and many matters which wonld otherwise have occupied our attention have been perforce left over until a more suitable accommodation is provided.

3. The Government Botanist spent ?30 days on tour and Io6 at head office. The Anamalais, the Wynaad, Malabar, the Mysore Ghats, the Mysore sandalwood tract, Dharwar, the Bombay Agricultural farms, Coimbatore, Bellary and various parts ot the Gddavari district have been visited for longer or shorter periods, and the Assistants have now commenced to take their part in this important work. They have been sent to Ootaoamun.l, Bellary, the G<3davari district, North Arcot, South Arcot, Er;de and Chingleput on independent missions.

4. Collections have been made of forest trees, grasses, peppery indigo*, and tne most various economic plants, while a very large number of seeds have been sent to the Keporter on Economic Products to the Government of India. Collections of special groups have been sent to authorities at home for naming, an active correspondence has been kept up with tbose interested in agriculture in the Presideucy aud numerous reports have been prepared lor the Director of Agriculture.

5. The following are among the more important pieces of work undertaken during the yoar iT connection with the systematic part of the survey, the Anamnlai forests were visited by the Government Botanist and an Assistant from April 7th to May 25th. This was at the instigation of the Forest Department, who wished to know what the botanioal names were of their forest trees. Three hundred and eighty numbers were collected consisting ot l&u different plants. Of the 100 trees, 70 have been named and 80 are not at present determined. The 80 fernaand shrubs have mostly been named. A valuable collection of tne peppers of these and other forests has been made, including dried and spirit specimens. A list ot tne trees with their vernacular names (about 200 of which have been collected trom the has been sent to the Conservator of Forests in the Southern Circle and a small tion of 45 trees has been placed in the Coimbatore Museum as a nucleus of a fores

This was the main systematic work of the year, but smaller collections weie made at such places as the Government Botanist visited.

6. An Assistant was also sent to make a study of the trees of the coffee zone of the Mysore forests. His first tour, which was more or less preparatory, was in Dumber. Most of the trees were found to be without Bowers or fruits but a set of about ^00 were got together, of which 109 have now been named. This tour, which was made with the idea ot ultimately helping the planters in their study of suitable shale trees and the causes o£ s ump rot in coffee, was undertaken with the assistance of Mr. Graham Anderson, C.I.*., we are indebted for many facts concerning the vernacular trees collected. The work is still being carried on as opportunity pennies witn en

A-Ao

7. District Forest-officers, two lots of grasses (37 species) from North Salem, one lot of grasses 34 specie,, ot Cuddapah. tunately indeterminable) from Nellore, and one smal I ot While welcoming these collections, we are consderably behindhand ID naming t as those sent infprevious year, Four col ect.ons h a v . systematic work.

8 Many individual plants have been forwardel to the Government Botanist at Sydney, as he

9. Our collection of 76 sheets of yams has been sent to and he has very kindly named them for us. Oar Government Botanist's drawings, has also been sent to of sheets of indigos have also been sent to Dr. Prain, who has ba study of the group and there are to be now species amongst the collected us. A full set of our balsams, together with the paintings sent to Sir Joseph Hooker, who is now engaged in has been pleased to speak well of their general get up, anu words of appreciation as they will show more than botany, although taking a subordinate place at present, is not

"The collection is in splendid order, well collected, well mounted, and well arranged. It is by far the finest collection of Indian balsams that I have seen and will afford me great help in many ways." Our 6maU collection, finally, of *Pandanacece* has been sent to Professor U. Martelli, in Italy, who is monographing the genus.

It may be explained that this sending of sheets from our collection to various correspondents is not at ali an unusual thing. Also, tiiat before doing so the collections are worked out to che best of our abil ity in the office, by this method we obtain a number of valuable and authoritative namings which from our position we are quite unable to give, and, furthermore, the collections are greatly enriched by the annotations or! monographers who are for the time being the greatest authorities on their respective orders.

10'. The herbarium work has been conducted under the disadvantages already alluded to. About £,000 sheets have been mounted for the systematic survey, 700 of which were from the Gódávari gorges and about 1,200 from the Anamalais. A large number (604 sheets) of plants have been prepared for transmission to Calcutta, but the congested state of our office has prevented them from being forwarded. In exchange, a considerable number of sheets (289) have been received from Dr. Prain for incorporation in our herbarium.

11. The collection ot fungi, commenced last year at the instigation of Dr. Butler, has been discontinued for lack of space. All our sorghum smuts have, however, been sent to him f°r naming. Added to them was a large collection of grasses with smuts on them. These have a certain economic importance iu that they affect the feeding value of pastures considerably.

Among the most interesting fungi sent to Dr. Butler was the red spot disease found so abundantly on sorghum leaves. This appeared at first sight to be identical with the red smut of sugarcane, *Cotletotrichum falcatum.* But Dr. Butler has determined it to be the closely allied *Colletotrichum lineola.* Various fungus diseases of sugarcane, prickly-pear, sorghum, etc., were also forwarded while many fungus diseases of sorghum, tenai, cumbu, paddy and other crops were collected. A certain amount of this work was collated in the bulletin on the diseases of sorghum in the Madras Presidency. A considerable amount of t.me was spent over the fungus diseases of the pepper plantations and a report was written on the subject. Casuarina trees, dying in numbers on the east coast, were also examined, but, affcer long search in the specimens f orwardel, no fungus hyphsa were observed which appeared likely to cause the diseased condition of the trees. In the short tour to Yelwal with Dr. Butler some attention was paid to the spike disease in sandal which has much the character of a fungoid attack. Generally speaking, however, this part of our work, the study of cryptoganiic botany, has been neglected. There is no one at present in the office who can be eutrusted with the difficult microscopic examination needed, and the time of the Government Botanist has been taken up with other matters.

12. The study of fungi is closely connected witti that of insect pests. The en to mo logical work of the year has been of a desultory and more or less preparatory character. Owing[1] to pressure in the office, the Sub-Assistaut appointed for this work has been frequently employed in other ways. The previous collections have been gone over and got into good order. By the advice of Mr. Lefroy and in the absence of proper reference collections we havj contented ourselves largely with determining the families of the insects collected. This method has been a useful education for the Sub-Assistant and has undoubtedly strengthened our hands in enabling us to deal more rapidly with such entomological work as is placed before us. -f

A couple of brightly coloured moths, which are accustomed to attack the sunn hemp field* in the Gódávari district disastrously, were worked out and, on reference to the Indian Museum, were named *Beiopia pulchella* and *Argina cribraria.* Some attention was devoted to the *Aleurodes* common in the diseased cane fields, but it was thought that this pest was secondary in its nature and only appeared on weakly plants. It has been used as an outward sign of the presence of red smut in the cane stem. The study of the Nilgiri white grub was continued, but comparatively tew additions were made to our knowledge of this serious pest. The work on this subject will, it is hoped, be shortly presented for publication in the form of a bulletin. A ready method has been discovered of freeing individual gardens from these depredations. Many references of a minor character have been received and dealt with, but as a rule the details forwarded have been too meagre and the spesimens immature. It is felt that the present arrangement of having one sub-assistant is hardly sufficient for dealing with this difficult subject. A certain amount of work on insect pests was included in the bulletin published on the diseases of sorghum m the Madras Presidency, but the Government Botanist has not been able to devote such attention to the subject as it merits.

13. The subject in Economic Botany which has engaged the attention of the office most has been the management and study of the experiments on the Samalkota Sugarcane farm. Ten visits were paid to the farm by the Government Botanist during the year. The longest of these was for twelve days in June after the opening of the canals, but, during the months of February and March, the attention of the office as a whole was almost entirely devoted to^ sugarcane matters, including the reaping of the crop and the planting for the new season. A number of canes were distributed to the ryots for experimental cultivation. A careful study, with the co-operation of the Chemist of the Deccan Factory, was made as to the possible ina" prove,ment of the local jaggery. The Samalkota canal was surveyed with the idea of finding a suitable place for a combined sugarcane and paddy station, but the result was not satisfactory. A number of canes were brought down to Madras and exhibited at the annual show of the Agri-Horticultural Society. A visit was paid to the Vizianagram plantations of five years' acclimatised Mauritius canes, and a considerable number of plants were added to the Samalkota collection through the kindness of the Collector. In return for this generous treatment a

scheme was prepared for the future sugarcane experiments at Vizianagram and the crop was taken off and the jaggery prepared by the Agricultural Inspector attached to the Samalkota farm. A number of canes were received from the Inspector-General of Agriculture, representing the two best Bengal varieties, and local kinds were collected from South Arcot, Madras and North Arcot for detailed study at the farm. Ttie collection of different varieties of cane under observation at Samalkota now numbers about thirty. A series of reports on the results obtained has been submitted to the Board so that further details are unnecessary here.

In connection with this subject it may be stated that the sugarcane cultivation was carefully studied in the Coimbatore district (where a serious attack of a sereh-like disease was noted), in North and South Arcot.

14. At the instance of the South Wynaad Planters' Association, the subject of pepper diseases was taken up with some amount of care. Since the diseases appeared to be chiefly- of fungoid nature, it was not possible to do much, but a couple of reports were written and printed by the association. South India being the original home of the pepper of commerce, and the classification of these puzzling plants being, according- to. Sir Joseph Hooker, in a state of almost hopeless confusion, the wild peppers were investigated and a good collection was made for future study. A visit was paid to the pepper gardens in Malabar (May 26th—June 11th). These were found also to be suffering from a number of diseases chiefly of fungoid and nematode origin. On the whole it was considered that the pepper plantations of the Presidency were not in a healthy condition and wall merited experimental cultivation. A visit was paid to the Cadamaney pepper plantations *on* the Mysore Ghâts, but although the mode of growing the plants was in mmy respects diametrically opposed to that in Tellicherry and the Wynaad, the disease appeared to be as prevalent and evasive as ever. The plantations at Cadamaney are very largely natural, that is to say self-sown in the jungle. The constant presence of a definite fungus ou the dying branches led to a series of inoculation experiments being commenced. But the results thus far seem to indicate that this fungus (a *Nectria ?) M* saprophytic and not the cause of the disease. The disease at Cadamaney was stated by the Kew authorities to be caused by a root fungus called *Rosellinia neeatrix Prill, fy Del.*, but a careful search on the spot failed to reveal its presence. A projactJd visit to the Bonaba Uhâts was frustrated by the lack of information placed at our disposal. From all accounts the pepper there seems to be in a more flourishing condition than elsewhere in India, and for this reason the plantations would be worth a visit later on.

15. The main agricultural tour set apart for the economic survey of the Presidency was in the Coimbatore district (July 9th—August 11th). The line chosen was Coimbatore, Udumalpet, Madaturkolam and Dharapuram. The crops inspected were oholam, cotton, tenai, ragi, cumbu, betel, pepper, cummin, coriander, fenugreek, sugarcaue, gingally, varagu, brinjals and several minor ones. Careful notes were taken on these crops and their pests, together with the water supply and mode of irrigation and the character of the soil and climate, liarge collections were added to the economic herbarium and many specimens were placed in spirit for future investigation. The bazar at Udumalpet was visited and numerous samples of different agricultural produce were taken.

16. During the month of September advantage was taken of a tour in South India by the Cryptogamic Botanist and Entomologist to the Government oE India to discuss matters connected with future joint work. The first place visited was the Samalkota farm where the various experiments were explained and specimens of pests were collected. The Madras office was then car^fuily gone over and a number of specimens in our colle3tlons ware noted and some of them named for us. The Entomologist kindly drafted a set of instructions for the guidance of tho Entomological Sub-Assistant. Tue Mysore State was then visited. The planters took advantage of our presence to hold a general meeting at Saklaspur. The Cadamaney pepper plantations were then visited by me and I again joined Drs. Butler and Lehmann at Yelwal for the investigation of the spike disease in sandal wood. The study of this disease having been placed definitely in the hands of Dr. Butler by the Government of India, I assumed a merely helpful attitude. Incidentally I learnt daring this visit that the same disease had appeared within a few miles of the sandal-hearing tract of Kollegal in the Madras Presidency. This I at once reported to the Board and subsequently learnt from the District Forest Officer of North Coimbatore that spike had made its appearance iu Kollegal at some distance from the Mysore boundary. I have placed the authorities in communication with Dr. Butler, who is conducting the investigation.

The futile attempt to reach the pepper plantations of the Bombay Ghâts belongs to the same tour and has already been referred to. I turned my attention to the crops in Dharwar and made collections and notes. The betel gardens of the little native state of Savanur were carefully gone over with Dr. Butler and a number of pests in this usually healthy crop were noted and collected.

17. In the earlier half of November I accompanied the Deputy Director on a tour of inspection through the Bombay farms. This was at the instance of the Inspector-General of Agriculture, who had assembled agricultural officials from various parts of India. As already reported in detail, we visited Poona, Bombay, Surat, Ahmedabad, Cbharodi, Nadiad, noted the experiments of Professor Gammie in cotton crossing, and observed the sugarcane, groundnut, tobacco and sorghums plots. Some observations made during tHs tour were incorporated m a recent report to the Board.

18. The Bellary farm was visited twica during the year in company with the Deputy Director of Agriculture, in connection with a scheme I had drawa up for cotton crossing in

the Madras Presidency. The plants were examined and numbered, herbarium specimens were collected, and the lint collected was sorted. A more detailed scheme for crossing was prepared for the plants growing at the Saidapet farm, but the weather proved most inauspicious and the floods of December nearly washed the whole place away. Separate reports have been prepared on these places, in connection with the improvement of Indian cottons.

19. These were the main agricultural tours conducted by the Government Botanist during the year. An Assistant was deputed to Ootacamund to study the swarming of the cockchafers in April and May, and again in September to examine the results of sowing some of the chief forms in boxes with grass on them. He was however new to the work and little success attended his efforts. Reference has been made to the tour in the Mysore coffee zone by another Assistant to collect the shola trees. An Assistant was deputed to Bellary to collect heads of the different kinds of cholam growing at the Experimental Farm. An Assistant was deputed to South Arcot and at the same time another to North Arcob to study the sugarcane growth in these two districts, and by this means our knowledge has been largely increased in both these directions. An Assistant was sent with good results among the Godavari ryots to .familiarise them with the methods of cultivation adopted in the Samalkot farm and to show them the kinds of cane we were distributing. Another Assistant was deputed to collect seed of Bourbon naturalised cotton in the Erode taluk for the Inspector-General of Agriculture. The Agricultural In* spector in charge of the Samalkot farm made several tours in the Godavari district and visited the Vizianagram plantation to make preparations for milling their canes for them there. Besides these tours among the Assistants, one accompanied me on the Anamalai tour, another went with me toTellicherry, and a third accompanied me throughout the Coimbatore Economic tour.

This is the first year in which systematic touring has been done by Assistants, and the results have been eminently satisfactory in a general increase of their usefulness.

20. About 1,000 sheets of economic plants have been added to the herbarium. These are made up as follows : —257 sheets of cholams, 93 of cumbu, tenai, etc., 66 sheets of sorghum diseases, 292 sheets of cottorls and over 200 of various others. Besides these a large number have been added to the spirit collections all of which are in a fit state to be examined under the microscope when a suitable opportunity occurs.

21. A number of seeds of different kinds of crops have passed through the office, during the year under review, to the Reporter on Economic Products to the Government of India. This woik, which has largely occupied the cleiical section, included 136 lots of paddy, 51 of cholam, 15 of chillies, 11 of ragi, 17 of cumbu and tenai, and others in smaller quantity, such as gingelly, cow-gram and varagu. A sample of each has been retained in the office, the economic collections being thereby considerably strengthened.

22. Twenty-three parcels of indigos were received from different parts of the Presidency. As recently reported, these include 17 kinds of wild and cultivated forms, and although therefore connected with the systematic survey, several species of high economic value have been recorded. Thus the wished-for *Indigo/era longeracemos* has been rediscovered in Travancore — a plant which has the reputation, rightly or wrongly, of being the most valuable indigo-producing plant in the world, and now cultivated in Madagascar and Zanzibar. *Indigofera sumatrana* appears to be the main cultivated form in the Madras Presidency, but /. *tinctoria*, /. *Anil and 1. artieulata* have been met with wild in different parts, and it seems not improbable that they may be escaped from former cultivation. We have in this study been much indebted to Major Pram, without whose help the work could not have been done.

23. The artist has worked steadily throughout the year and has added a. fine series of drawings and paintings to the herbarium. He was deputed for one month to study the methods of the artist working under Mr. Cameron at Bangalore, and his work has profited much thereby. We are indebted to Mr. Cameron for his kind personal superintendence in this matter. The artist's work consists of 38 paintings, chiefly of flowers and varities of sugarcane, and 53 folio pages of drawings, the latter being reproductions of sketches on tour by the Government Botanist, and chiefly consisting of analyses of various forest trees.

2*4. The following publications have beeD issued during the year :—

(1) A Memorandum on the Pressing, Preservation and Despatch of specimens to the office of the Government Botanist.

(2) A Note on the Experimental Sugarcane Cultivation at Samalkota. This was issued as Bulletin No. 48 of Vol. II of the Madras Department of Agriculture.

(3) The diseases of Andropogon Sorghum in the Madras Presidency, Bulletin No. 49, itt the same series.

(4) Two reports on the Wynaad Pepper plantations have ,been- printed and circulated by the South Wynaad Planters' Association.

(o) *Notes on Floras have been prepared for various publications.—The* Madras Presidency* the South Arcot District, the Godavari District.

APPENDIX TO BOTANICAL SURVEY OP INDIA REPORT FOR 1903-04.

A list of papers published during the year 1903-1904, in or regarding India, bearing on the work of the Botanical Survey Department.

BARBER, C. A.—Note on the experimental Surgar-Cane station at Samalkot, Godavari District ; *Madras Agric. Bull.* vol. II., No. 48.

BARBER, C. A.—Diseases of *Andropogon Sorghum* in the Madras Presidency; *Madras Agrie. Bull.* vol. II., No. 49.

BAKTON, E. S.—(Mrs. Antony Gepp) List of Marine Algae collected at the Maldive and Laccadive Islands by J. S. Gardiner, Esq., M.A.; *Jour. Linn. Soe.* vol. XXXV., p. 475.

Boss, J. C—Electric Response in ordinary plants under mechanical stimulus; *Jour. Linn. Soc.* vol. XXXV., p. 275.

Boss, J. C—On the Electric Pulsation accompanying: automatic movements in *Desmodinm gyrans ; Jour. Linn. Soc.* vol. XXXVI., p. 405.

BotiRDiLLOtf, J. *F.-Holigarna nigra,* a new species; *Ind. Forester* vol. XXX., p. 95.

BRANDIS, SIR D.—A note on *Gelsemium elegans; Pharmaceutical Journal* vol. LXX., p, 868.

BRANDIS, SIR D.—The Bamboo Fungus of Burma; *Pharmaceutical Journal* vol. LXX., p. 868.

COOKE, *T.—ffleiotis trifoliolata; Booker's Icones Plantarum* vol. XXVIII., t. 2753.

COOKE, T.—Flora of the Bombay Presidency, vol. II., part I.

FINET ET GAQNEPAIN.—Contribution a la flore de TAsie orientale; *Bull. Soc. Bot. de France* vol. L., p. 547 : vol. LI., p. 56; p. 130.

FISHER, W. R.—Sweet Chestnuts in India; *Ind. forester* vol. XXIX., p. 190.

GAGE, A. T,—A census of the Indian Polygonums ; *Records Bot. Surv. India, vol.* If,, p. 371.

GAMBLE, J. S.—*(See* KING, Sir G.)

GAGNBPAIN— *(See* FINET).

GAMMIE, G. A.—The trees and shrubs of the Lonavla and Karia groves; *Jour. Bomb. Nat. Hist. Soc.* vol. XV., p. 279.

GLEADOW, *F.—Jatropha Curcas; Jour. Bom. N at. Hist. Soc.* vol. XV., p. 365.

HENSLEY, W. B.—*Bitlbophyllum auric omum; Bot. Mag.* vol. LX., t. 7938.

HOOKER, Sir J. D.—*Iris Collettii, Imp at ie us falcifer, Agapetes Moorei, Sauromatnm brevipes; Bot. Mag.* vol. LIX., t. 7889, t. 7923, t. 7928, vol. LX., t. 7940.

HOPE, C. W.—The Ferns of North-Western India, Part III.—The General List; *Jour. Bom. Nat. Hist. Soc.* vol. XV., p. 78 ; p. 4.15.

KING, Sir G. AND GAMBLE, J. S.—Materials for a Flora of the Malayan Peninsula, No. 14, *Jour. As. Soc. Beng.* vol. LXXII., part 2, p. 111.

KIKTIKAR, Lieut.-Col. K. R.—The Poisonous plants of Bombay, Part XX.; *Jour. Bom. Nat. Hist. Soc.* vol. XV., p. 56 (with Plate).

PHAIN, D.—Some additional *Scrophularinea; Jour. As. Soc. Beng.* vol. LXXIL, part 2, p. 11.

PHAIN, D.—The Species of *Dalbergia* of S. B. Asia; *Ann. Boy. Bot. Gard., Calcutta,* vol. X.» part 2.

PHAIN D.—Flora of the Sundribuns ; *Records Bot. Surv., India,* vol. II., p. 231.

PHAIN', D.—Notes on Sundribuns Plants ; *Proc. As. Soc Beng.* for 1903, p. 107.

PHAIN, D.—Bengal Plants; 2 *vols.* : Calcutta, October 1903.

RAO, M. RAMA .— Root-parasitism of the Sandal Tree ; *Ind. Forester* vol. XXIX., p. 386.

RYAN, G. *M.—Dioseorea daemona* Roxb.; *Jour. Bomb. Nat. Hist. Soc.* vol. XV., p. 366.

WOODROW', G. M.-Four Interesting Bombay Plants; *Jour. Bomb. Nat. Hist. Soc.* vol. XV., p. 363.

G. I. C. P. *O.—XQ. m D.* a *H.* I.—2-8-1904.—50.—C N D.

Report of the Director of the Botanical Survey of India for the year 1904-1905.

1. Survey of Eastern India.—It was not found possible to depute a botanist to do any botanical survey work in the proper sense in the area under the Superintendent of the Royal .botanic Garden, Calcutta. Native collectors —who however are not in the remotest sense botanists—were sent to Jfjlliet, to Tenasserim and—by the kindness of Mr. Merk, Chief Commissioner of the Andamans—to the Nicobar Islands. Lepcha collectors were also employed in the Chumbi valley, working under the supervision of Mr. G. L. Searight, the officer then in charge of the Koad Survey there. Native collectors were also made use of in Chota Nagpur through the kindness of the Reverend Father Cardon, S.J. TEeTofficers of the Tenasserim Forest Circle also contributed a good few interesting plants. Although the efforts of the native collectors resulted in a goodly accumulation of specimens, a true picture of the character and aspect of the vegetation of any district collected over can be formed only by a qualified botanist surveying it at first haad and unhurriedly. So far as the survey has to depend on collector^ quite ignorant of botany so far is it an unsatisfactory make-shift.

2. **Survey of Western India.**—During the hot weather vacation Mr. Bhide, the officer then in charge of Mr. Gammie's duties, made a botanical excursion from Kolhapur to Ratnagiri *via* Amba Ghat, returning by the Phonda Ghat. In the cold weather Mr. Gammie botanised over parts of Ouzerat and the Khandesh district.

3. Survey of Southern India.—The Government Botanist—for reasons fully set forth in his report as Government Botanist—could give but little attention to systematic survey work during the year. He, however, made collections at various places wherever he was on tour in connection with his economic duties. A sub-assistant also collected in the Travancore backwaters and along the chief sandal-bearing tracts of Mysore.

4. Survey of Northern India.—The Economic Botanist to the Government of the United Provinces is shewn in the classified list of officers of the Botanical Survey. He states that he is unable to furnish a report.

5. **Publications.**—During the year there were issued the following **numbers of the *Records of the Botanical Survey* :—**

Volume III. No. 1.—*The Vegetation of the district of Minbu in Upper Burma* by *A. T. Gage.*

Volume III. No. 2.—*The Vegetation of the districts of Bughli-Bowrah and the 24rPergunnahs* by *D. Train.*

Volume IV. No. *l.—An Epitome of the British Indian Species of Imp aliens9 Part I,* by *Sir J. J). Hooker.*

Various other papers have been published during the year, which have got little or nothing to do with the Botanical Survey of India as a Department. They are mentioned in the appendix to this report.

6. Economic Botany.—The Officiating Director attended the Conference of the Board of Agriculture held at Pusa in January 1905.

The enquiry—referred to in last year's report—into the identity and distribution of the various *Agaves* and *Furcroeas9* was finished during the year, and the results have been embodied in a Bulletin of the Bengal Agrir **cultural** Department still in the press. Samples of the fibre obtained from plants of *Crot alar iajuncea* in cultivation during the year were sent to England **for** valuation. On the whole these samples were bad as compared with those of the previous year, but it was clearly enough brought ^Qut that there is not **any** real difference in the plants raised from seed received from widely separated parts of India. The samples *sent to* England from the Botanic Garden compared well enough with trade samples from Cawnpore, Coconada **and** *elsewhere which reached the London market* about #ie same time i#

November but compared badly with the Bengal or Belgatchia brand of Sunn-hemp which reached London about February. This may have been due to the fact that the sowing of the seeds for experiment in the Calcutta Garden apparently took place at an unsuitable time, and the fibre consequently was harvested under unfavourable conditions. In Northern and Central Bengal* Chota Nagpur and in the United Provinces, Sunn-hemp is sown in May or June and harvested in August or September, the product reaching the London market in November. In the moister districts, especially in Eastern Bengal, Sunn-hemp is sown after the Jute harvest in September and October and harvested in December and January so that the Bengal brand of Sunn-hemp may reach the London market in February. The experimental cultivation is to be repeated, sowing this time in accordance with the Eastern Bengal practice.

The Director in conjunction with the Inspector General of Agriculture and the Reporter on Economic Products to the Government of India, investigated the alleged deterioration of Jute, and a report thereon was submitted to Government. A great number of various kinds of cotton received from the Inspector General of Agriculture have been cultivated during the year for botanical identification. The cultivation of plants and the identification of plants and specimens ot economic importance on behalf of the Beporter on Economic Products has gone on as usual.

The Economic and Agricultural problems dealt with by the Economic Botanist to the Bombay Government and by the Government Botanist, Madras, are referred to in their respective reports subjoined. This economic and Agricultural work which takes up most of the time of those offBcers, is initiated and entirely controlled by their respective Governments so that it does not come directly under the cognizance of the head of the Botanical Survey.

7. Staff.—Lieutenant-Colonel Prain, I.M.S., was in charge of his post as Director of the Survey until he went on furlough on 1st November 1904. ^ For the remainder of the financial year Captain A. T. Gage, I.M.S., officiated. Mr. G. A. Gammie was on leave from 19th March 1904 to 19th September 1904, during which period Mr. B,. C. K. Bhide, offl&ciated. Mr. C. A. Barber had charge of his post during the year. Mr. H. M. Leake is shown in the classified list of offBcers of the Botanical Survey as appointed to the Department in November 1904.

A. T. GAGE,

Acting Director, Botanical Survey of India.

Report on the Botanical Survey Operations in the Bombay Presidency for the year 1904-1905 by G. A. Gammie, Economic Botanist, in charge of the Botanical Survey of the Bombay Presidency.

I was absent on leave from the 1st April to the 19th September, and again on deputation to the conference at the Agricultural Research Institute, Pusa, from January 3rd to January 11th, 1905. During these periods Mr. R. K, Bhide, the keeper of the Herbarium, held charge of the office.

1. TOURS.—During the hot weather vacation Mr. Bhide, accompanied by Mr. Shevade, Assistant Biological Botanist at the Pusa Research Institute, completed a botanical excursion from Kolhapur to Ratnagiri *viâ* Amba Ghat, returning *viâ* the Phonda Ghat. During the cold weather vacation I botanized over parts of Guzerat and the Khandesh District. In addition I devoted much time to the conduct of botanical researches in the Government Farms at Kirkee, Manjri and Surat. The work effected at the Ganesh Khind Botanical Gardens forms the subject of a separate report submitted through the Director of Land Records and Agriculture. The two plant collectors paid several visits to Lonawla, Khandala, Matheran and other places in search of particular plants.

2. THE HERBARIUM.—The following gentlemen have made most valuable contributions during the year. Dr. T. Cooke, who presented a further instalment of his Herbarium up to the end of Boraginaceae. His collection is invaluable as it is named in accordance with his book.

The Superintendent, Royal Botanic Gardens, Calcutta, who presented a valuable series of specimens.

Mr. G. M. Ryan completed his collection of Thana plants and these now remain for us to conjointly work up for publication.

Mr. A. C. Hartless presented a large set of Eastern Himalayan plants.

The Superintendents of the Victoria Gardens, Bombay, and Empress Gardens, Poona, sent specimens of many rare plants primarily for purposes of identification.

The following is the record of specimens incorporated into the Herbarium during the year :—

Collected by	Mr. Gammie	954.	sheets.
„	„ Bhide	1,459	*a*
„	„ Shevade	695	„
„	„ Ciarade	1,243	*a*
Presented by	Dr. T. Cooke	1,066	*a*
„	Mr. Hartless	1,007	*a*
„	„ Ryan	760	ii
„	„ Mollison	142	)>
„	Superintendent, Royal Botanic Gardens, Calcutta	871	*if*
„	31 Empress Gardens, Poona	60	*a*
„	it Victoria Gardens, Bombay	30	39
	Total	8,287	JJ

The following is the number of specimens distributed :—

To Ganesh Khind Botanical Gardens. . . . .109 sheets.

8. PUBLICATIONS.—Part 1 of Volume II of Dr. T. Cooke's Flora of the Bombay Presidency was published. I supplied a revised Botanical account of the Indian cottons with coloured illustrations drawn by Mr. Bhide, to the Inspector General of Agriculture in India who is arranging for its publication. Preliminary classifications on the wheats, juars, rices, etc., of Bombay have now been drawn out and I hope to publish them after anothei\ season's experience.

4. SISAL HEMP.—NO healthy plants flowered during the year. Those already in cultivation at the Ganesh Khind Botanical Gardens are making good progress. Those at Nandgaon increase in size very slowly and it will be some years before they attain their full size.

5. SABAX GRASS.—This **experiment is now being conducted at the Ganesh Khind Botanical Gardens. It has been proved that this grass can be successfully grown in the Deccan as a commercial venture so that it is not necessary to continue the report on this subject.**

6. ESTABLISHMENT.—**I have to thank Mr. R. K. Bhide for his efficient control of survey operations during my absence and also for his assistance in the work throughout the year. Mr. Shevade, B.Sc, also assisted as a part of his training for the post of Assistant Biological Botanist at Pusa. Messrs. Garade and Khomna, the two plant collectors, have done good work.**

G. A. GAMMIE,
Economic Botanist and Officer in charge
*Botanical Survey of Bombay**

COLLEGE OF SCIENCE,
POOKA ;
The 22nd June 1905.

#• J, C. P. 0—No. 1021 D. B. S. L-26-7-1905.-.52.-B. N. D.

APPENDIX I.

Table of Contents,

ANNUAL REPORT OP THE GOVERNMENT BOTANIST, MADRAS.

I have the honour to present the following report of work done in my office during the year 1904-1905.

2. Owing to various causes this work suffered considerable derangement—

(1) The office was transferred during the year to the Drill Hall of the Madras Volunteer Guards. The collections were rearranged and spread out, the new premises were furnished, a laboratory was constructed and the library brought into order.

(2) There was a great extension in the work of the Samalkota sugarcane farm. Land was acquired for a permanent farm and building operations commenced. Two new farms were opened—one at Palur in South Arcot for the study of ground-nut, sugarcane and indigo, and one at Taliparamba in Malabar for the study of pepper.

(3) The ordinary work of the office was further disturbed by the deputation of the Government Botanist to the Pusa Conference and the ensuing heavy work in connection with the development of the Agricultural Department in Madras.

3. An important addition was made to the staff in the shape of fieldmen. This experiment promises to be of the greatest assistance in various directions. There has, however, been considerable difficulty in obtaining suitable candidates, because of the absence of an assurance of future prospects. Only two of the three posts have been filled.

4. The Government Botanist spent 200 days on tour during the year. The tours projected and sanctioned by Government were (1) an economic tour in the Ceded Districts and (2) a systematic survey tour in the Travancore forests. The former was given up in favour of a thorough study of the South Arcot district in connection with the Palur farm and the latter was postponed in favour of a similar study of Malabar pepper plantations in preparation for the Talipatainba farm. Seven visits were made to Samalkota during the year. A visit was paid to Koilpatti to observe the cotton crossing experiment", to Burliyar and Kallar plantations of the Nilgiris and to the Melrosapuram farm. Frequent visits were paid to the Saidapet farm to observe the experiments in ground-nut, indigo, sugarcane and cotton. A short tour was made to Alamuru in the Godavari district to study the palmyra disease and the deputation to Pusa was made use of for special studies at the Royal Botanic Gardens, Calcutta, and the office of the Reporter on Economic Products to the Government of India.

The various assistants spent about 360 days on tour including visits to Travancore, Mysore, Godavari, South Arcot, Koilpatti, Ootacamund, Erode, Guntur, Malabar, Udamalpet, Saidapet, Coimbatore, Tanjore and Salem.

5. The systematic botanical survey of the Presidency has had comparatively little attention paid to it during the year. One Sub-Assistant is set apart for the work of keeping the collections of the Madras flora in order. . He has also to make occasional collecting tours. But this officer has during the year been frequently employed on economic work.

A tour was made by him along the Travancore backwaters, partly for the purpose of preparing the way for the Government Botanist, but more especially for making a collection of the indigenous indigos and collecting seeds of *Indigofera longeracemosa* recently rediscovered in that part of South India. Another tour was made along the chief sandal-bearing tracts of Mysore for the formation of an authoritative " Sandal flora ". This work was unfortunately rendered difficult by the prevailing drought, few flowers or even leaves being found on the majority of plants. Advantage was taken of this tour to make a collection of the haustoria of the sandal-wood attached to different plants for a comparative study on which the Government Botanist is engaged.

Collections of minor importance were made at various places wheiever the Government Botanist was on tour.

b. The herbarium received a considerable amount of attention. The whole of the cases were rearranged and the sheets examined and cleaned upon transference to more commodious quarters, and the regular monthly inspection was rigidly adhered to. About 2,000 sheets were mounted, this number being made up of 1,000 from the Godavari gorges, 700 from the Wynaad and 300 from the Kistna uplands. Three hundred sheets were mounted for the Calcutta herbarium and about the same number was despatched. In exchange for these, 291 sheets were received from Calcutta.

Only 500 sheets were written on and incorporated in the finished collections, and this fact is worthy of attention. There is a very large collection of mounted specimens in the herbarium not yet written upon. Many of these are already worked out, but there has not been time for the Sub-Assistant or the Government Botanist to put the finishing touch and add them to the collection. During the year 2,000 sheets have been mounted and only 500 have written upon, the mass of sheets undealt with having thus been increased by 1,500, and this in a year when active collection was in abeyance. The Botanical survey of tbe Presidency takes up a very small portion of the time of the staff at present. But, considering the value of the collection and the advisability of keeping pace with Bengal, Bombay and the United Provinces in all of which floras have now been prepared, it should be placed upou a more satisfactory basis.

7. During the intervals of economic work, the Government Botanist devoted some of his time to a biological study of the parasitic phanerogams of the Presidency. These have considerable economic importance. The various species of Loranthus severely injure many of the forest trees and a careful study of their mode of life has been instituted. Considerable collections have been made of all stages of their development from the seed to the mature plant. Observations are much needed by Eorest officers as to the special birds which distribute the seeds of the different varieties.

A close study has been undertaken of the sandal haustoria. It is felt that a biological study of this curious parasitic tree is needed in order to prepare the way for successful plantation. Some of the results of this investigation have been published in a couple of papers in the " Indian Forester ".

8. Although no great strides have been made in the collection of economic plants during the year (for the reasons stated in paragraph 2), the tendency towards the development of this branch of herbarium work at the expense of the systematic survey has been very marked. The study of plant diseases generally has received a check because of the absence of competent assistants and the necessity of employing the whole staff on general agricultural matters. Practically the whole strength of the office has been thrown into the foundation of the three faims mentioned below.

9. The work of the *mgarcane farm at Samalhota* has been carried on with energy. Great attention has been paid to the collection and study of the different varieties of canes, 80 or more, which have now been got together. Large numbers of the Red Mauritius canes were distributed to the ryots at the commencement of the year and the plots on which these were planted were inspected twice during their growth by the Agricultural Inspector. The success of this variety as compared with the local kinds was so marked that the demands for seed were in far excess of the capacity of the farm. The experiments with methods of planting, the application of different kinds of manures, the formation of a weed compost, the raising of seedling canes and the collection cf sports have been continued.

Under instructions from the Director of Agriculture, a block of 86 acres has been selected for the formation of a permanent sugarcane farm, the land during the past 2 years having been rented each season, a jaggery shed and store-house has been erected and plans have been prepared for the laying out of the farm, the erection of quarters for the Inspector in charge and an inspection bungalow for European officers.

The farm has received many visitors including the Director of Agriculture, the Deputy Director of Agriculture, the Collector of the district, Dr. Lehmann, the Hon'ble Mr. Yorke, the Raja of Venkatagiri, three Zamindars of Peddapur, the Manager of Pithapuram Estate, the Cocanada Chamber of Commerce, the District Association and hundreds of ryots, many of whom have travelled great distances. Selected cultivators deputed by various land-owners have been received upon the farm and instructed in the methods of cane cultivation adopted. During the year a set of Barbados seedlings have been successfully introduced and are being grown under observation at Saidapet farm and the Agri-Horticultural Society's garden in Madras.

10. Consequent upon the study of the conditions of the pepper plantations commenced last year, it was decided by Government that a special farm should be devoted to the subject. After a considerable amount of touring, it was considered advisable that this farm should be placed in Malabar, the home of the pepper plant, and not in the Wynaad, although a subsidiary farm might be formed there later. A site has been accordingly selected at Taliparamba in the Chirakkal taluk. Although most of the preliminary work has been accomplished, the land had not been acquired at the close of the official year.

11. The importance of the ground-nut in South Arcot and the occurrence of a serious disease in this staple in the Poona farm led to a careful study of this crop. Three tours were made by the Government Botanist and several by his assistants in the South Arcot district and, finally,

site for the farm was selected near Palur in the Cuddalore taluk. Arrangements were made by the inclusion of 5 acres of wet land for the formation of a sugarcane nursery in the south of the Presidency, and a truck-load of the best Samalkota varieties were sent down and planted A number of indigo varieties had been collected in the Government Botanist's office as detailed elsewhere in this report, and these have been planted as a rotation crop on the dry land not required for ground-nut. The land for this farm has been rented for two years. It has been enclosed and planted up and an office and cattle-shed have been erected.

12. The following subjects of economic interest have received special attention during the year :—

Grasses.—Seven hundred and eighty-five sheets were mounted during the year, com" prising collections from Tinnevelly, the Nilgiris, Madras and the Wynaad. Seventy-one of these sheets refer to diseases. A set of grass-smuts, sent for determination in November 1903, were worked out by Dr. Butler, and, out of the fifteen kinds sent, six were found to be new species, while three have not been finally named.

13. *Lemon-grass.*—Two lots of lemon-grass have been received for the herbarium, one from Mr. Jowitt of Ceylon, who is specially studying the group, and one from Mr. Barton Wright o£ the Nilgiris. These have been determined as regards tho species, but the naming of the varieties has not been possible in the absence of authentic herbarium specimens.

A wardian case of Cochin lemon-grass was carefully packed and forwarded to Kew for the Imperial Commissioner of Agriculture in the West Indies. The result was a failure, the plants being dead on their arrival in England. A third lot has been obtained from Cochin for another attempt. Seed will also be collected for transmission.

14. *Agaves.*—At the instance of the Superintendent of the Calcutta Botanical Gardens., and of Mr. J. R. Drummond, I.C.S., a thorough survey has been made of the agaves of the Presidency. These plants, although widely scattered, are not natives of India, having been introduced at various periods. One hundred and nine lots were received and forwarded to Calcutta. The sending of such large specimens involved a considerable amount of labour and the collection of their vernacular names a»»d nses entailed an active correspondence throughout the year. The results, however, have justified the trouble, for it has been found that the names locally applied are pretty generally incorrect. The ecnomic importance of this cannot be over-estimated. Various attempts have been made in South India to start fibre plantations, and, for this, the true determination of the species is of prime importance. For instance, the plant usually called *Agave americana* proves to be *Agave vera-cruz* and the fibre value of these plants is probably very different. A bulletin on the subject is about to be published by the Calcutta authorities and full details will be found in it regarding the Madras varieties.

15.>*Sorghums (cholum,jonna).*—Stventy-one numbers of sorghums were forwarded to the Reporter on Economic Products in continuation of last year's collections. Specimens of all these have been retained in the local office herbarium. A study was made of the Irungu oholums in the Koilpatti farm and these were divided into fifteen varieties which, it was recommended, should be kept apart. An attempt was made to classify all the sorghums thus far collected and an assistant went over all the sheets with the Deputy Director of Agriculture. The collection of eorghums in the office is now large and fairly representative. It includes 680 sheets of sorghum heads and 70 sheets of diseased specimens, filling six large herbarium cases.

16. *Yams, etc.*—The survey of the wild yams of the Presidency has been continued and 51 sets of leaves and tubers have been forwarded to the Reporter on Economic Products for further growth and determination. Besides these, various packages of paddy, kudiraivali *(Panicum frumentaceum, Boxb.),* varagu, cumbu, tenai, pepper chillies and so forth were aUo forwarded for experimental growth at Sibpur, duplicates being retained in the office collection.

17. *Indigo* —Indio-o seed has been collected from various sources for growth on the Palur farm. An assistant was sent to Travancore to obtain seed of *lndigofera longeracemosa.* He succeeded in finding a number of plants, the seed of which was selected and has been planted at Palur, Saidapet, Pusa, Calcutta and Java. Seed of *lndigofera ami,* discovered only in the SatyamanfflaoT taluk of the Coimbatore district, has also been shown but *lndigofera arti culata?*found in the Palnad taluk of the Kistna district, was not obtainable because of the failure of the north-east monsoon. *Delhi indigo* was obtained from Colonel Pram. *lndigofera arreeia* was received from Mr. Coventry at Pusa, while the *Cocanada, Tanjore* and *Nandyal* varieties have been obtained from various parts and have been planted in the series.

18. *Cotton.*—The investigation of cotton problems has been relegated to the office of the Deputy Director of Agriculture. A certain amount of attention was, however, devoted to the S e c t . A larU collection of the *tree cottons* from all parts of the Presidency was grown on the Saidapet farm for the Inspector General of Agriculture, and herbarium specimens of these teen varieties of *American cottons,* considered

and crown at SaidaDet . Herbarium specimens have been taken *CX.* these^ A couple ot plots *^iihtsSlt^ZYerrapattyoi* Kamool and the *Bourboun* of Erod were also grown at SaidfpetTnder the Government Botanist's directions. Three mmor experiments m cotton-growinl were tried in the Salem, Tanjore and Coimbatore Jails, an attempt being made to determine the nature of the plants grown from bazaar seed in each case. Owing to

unfavourable nature of the weather, all of these plots which were inspected several times during the year, have failed.

19. *Castor.*—At the instance of the Ceylon Agricultural Department, a small collection of the different varieties of castor was made and the following were transmitted :— *Pedda* and *Chit fa amudam* from Bezwada, *Periya* and *Chitta amanakku* from Coimbatore, *payira amudam* from Guntur, *Tota amudam* from Hindupur and *ShenJcottai,* from Erode. The results of sowing these different varieties in the Ceylon agricultural farm will be followed with interest and should be of use to Madras.

£0. A great amount of miscellaneous work has been accomplished by the office during the year and the correspondence has been large. Attention has already been drawn to the absence of the skilled assistants in the investigation of plant diseases. Considerable numbers of specimens have, however, been obtained during the year and have received as careful attention as was possible under the circumstances. No large additions have been made to the collection of .Madras plant-pests. The Cryptogamic Botanist to the Government of India, besides naming our grass-smuts, has forwarded a useful herbarium set of sugarcane diseases in North India and has helped us in various other ways. Both he and the Itiepector General of Agriculture have visited Madras during the year to the great benefit of the Department. Upon removal of the office to more commodious quarters, the collection of photographic negatives has been got into order and now numbers between 300 and 400. Work in this direction has, however, been hampered by an injury in the Government Botanist's fingers and the absence of any one else in the office capable of doing the work. A photographic subordinate is badly needed. The office has sustained a severe loss in the death of the artist Govindarajulu who showed great talent and whose place it will be difficult to fill.

C. A. BARBER,
Government Botanist, Madras,

MADBAS ;
The 12th June 1905.

G. I. C. P. O.-No. 1021 D. B. 8. I.-26-7.1905.-62.-B. N.

APPENDIX TO BOTANICAL SURVEY OF INDIA REPORT FOR 1904-1905.

*'A list of papers published during 1904*1905 bearing on the Botany of India.*

JBOURDILLON, T. F. . Eugenia Rama-Varma, a new species. *Indian Forester,* xxx, No. 4, p. 147.

^OUEDILLON, T. F. • Eugenia occidentals, a new species. *Indian Forester,* xxx, No. 5, p. 195.

BoURDILLON, T. F. • Dialium travancoricum, a new species,. *Indian Forester,* xxx, No. 6, p. 243.

BOURDILLON, T. F. . On two species of blackvvood found in Southern India. *Indian Forester,* xxxi, No. 3, p. 124.

BRANDIS, SIR D. . Lindera aromatica. *Hook Icones Plant,* viii, t. 2784.

BURKJLL, I. H. See *Prain.*

DRUMMOND, J. R. • On a new Scirpus from Baluchistan and certain of its allies. *Journ. As. Soc. Bengal,* Ixxiii, pt. ii, 1904, pp. 137—148.

FINET ET GAGNEPAIN . Contributions a la Flore de l'Asie orientale. *Bull, Soc. Bot. de France,* li, p. 388, 461.

FISCHER, C. E. C. „ Notes on the Flora of Northern Ganjam. *Journ. Bombay Nat. Hist. Soc,* xv, No. 4. p. 537.

GAGE, A. T. „ The vegetation of tho district of Minbu in Upper Burma. *Records Bot. Survey India,* iii, No. 1.

GAGNBPAIN, F. . Zingiberacees efc Marantacees Nouvelles. *Bull. Soc. Bot. de France,* li, No. 4, p. 164.

GAMBLE, J. S. . See *King.*

HEMSLEY, W. B. . Loropetalum chinensc. *Bot. Mag.,* 3rd Series, Ix, t. 7979.

HEMSLEY, W. B. . Rosa gigantea. *Bot. Mag.,* 3rd Series, Ix, t. 7972.

HEMSLEY, W. B. . Dendrobium Williamsoni. *Bot. Mag.,* 3rd Series, Ix, t. 7947.

HEMSLEY, W. B. „ Vanda pumila. *Bot. Mag.,* 3rd Series, Ix, t. 7968.

HEMSLEY, W. B. . Tupisfcra Clarkei. *Bot. Mag.,* 3rd *Series, Ix, t. 7957.*

HOLE, R. S. . *A* contribution to the Forest Flora of the Jubbulpore Division, C. P. *Ind. Forest,* xxx, pt. 11, p. 499, pt. 12, p. 566.

HOOKER, SIR J. D. . An Epitome of the species of Impatiens of British India, Fart I. *Records Bot. Survey India, iv,* No.].

HOOKER, SIR J. D. • On the species of Impatiens in the Wallichian Herbarium of the Linnean Society. *Journ. Linn. Soc,* xxxvii, No. 257, p. 22.

KING, SIR G., AND GAMBLE, J.S. Materials for a Flora of the Malayan Peninsula, No. 15. *Journ. Asiat. Soc* Bengal,* lxxiii, Part II, No. 3, p. 47.

MAIIALUXMIVALA, C. D. • Notes on some of the plants introduced into the Victoria Gardens, Bombay, during the past eight years. *Journ. Bombay Nat. Hist. Soc.,* xv, No. 4, p. 674.

MARTELLI, IT. . Pandani Asiatici nuovi. *Bull. Soc. Bot. ItaL,* 1904, No. 6, p. 298.

NECHITCH, A. . Sur les ferments de deux levains de l'Inde, Ie Mucor Prainii et Ie Demotidium Chodati. *Bull. Soc. Bot. de France^* v., p. 106.

PRAIN, D. . The vegetation of the districts of Hughli-Howrah and the 24-Pergunnahs. *Records, Bot. Survey of India,* iii, No. 2.

PRAIH, D. . An undescribed Indian Musa. *Journ. Asiatic Soc. Bengal,* Ixxiii, Part II, No. 1, p. 21. (Noviciae Indicaa XXI).

PRAIN, D. . An undescribed Araliaccous Genus from Upper Burma. *Journ. i Asiat. Soc. Bengal,* Ixxiii, Part II, No. 1, p. 23, with plate. (Novicise Indicre XXII).

PRAIN, D. . Four orchids new to the Indian Flora. *Journ. Asiat. Soc. Bengal,* Ixxiii, Part II, No. 5, p. 189. (Noviciae Indies XXIII).

PRAIN, D. . Some new Indian Plants. *Journ^sAsiat. Soc. Bengal.* Ixxiii, Part II, No. 5, p. 192, with'^2 plates. (Novici© Indicse XXIV).

On the Morphology, Teratology and Diclinism of the Flowers of CannabiV. *Set* Mem. officers of the Med. and Sanit. Dept8. of the Government of India.* New Series, No. 12.

PRAIN, D. . Notes on the Roxburghiacea, with a description of a new species of Stemona. *Journ. Asiat. Soc. Bengal,* lxxiii, Part II, No. 2, p. 39.

PRAIN, *D.* . The Asiatic species of Ormosia. *Journ. Asiat. Soc. Bengal.* lxxiii, Part II, No. 2, p. 45.

PRAIN, D., AND BTJRKILL, H. On Dioscorea birnianica—a new species from Burma—and two allied species. *Journ. Asiat. Soc. Bengal.* Jxxiii, Part ii, 1904, pp. 183—187.

ROUE, R. A. . Dendrobium regium. *Botanical Magazine,* 4th Series. i, t. 8003.

ROLPE, K. A. . Spathoglottis Hardingiana. *Bot. Mag.* 3rd Series. lx, t. 7964.

RYAN, G. M. . The Wild Plantain (Musa superba, Roxb.) *Journ. Bombay Nat. Eis. Soc.* xv, No. 4, pp. 586—593, with plate.

RYAN, Q. M. . Water-yielding plants found in the Thana forests. *Journ. Bombay Nat. Hist. Soc.* xvi, No. 1, p. 65.

SPIRE, C. . Contribution a l'etude des Apocynees indo-chinoises. *Trav. Labor. Mat. Med.* Paris, 1904. Tom. 2, Part. 4.

STAPF, O. . On the fruit of Melocanna bambusoides. *Trans. Linn, Soc.* 2nd Series, vi, Part 9.

STAPF, O. . Arundinaria Falconeri. *Bot. Mag.* 3rd Series, lx, t. 7947.

«. L C. P. 0.—No. 1021 D. B. S. I.-.26.7-1905.-52.—B. N. D.

Report of the Director of the Botanical Survey of India for the year 1905-06.

1. Eastern India.—In Bengal one collector was sent to Orissa and another to Pusa, the latter to collect the interesting plants of the still wild parts of the estate. Collections of living plants continued to be made in Chota Nagpur by men working under the supervision of the Rqv. Father Cardon, S.J. In the Darjeeling district collections were made by the Acting Director to supplement the herbaria in the Lloyd Botanic Garden, Darjeeling, and at the Government Cinchona Plantation. The Curator of the Lloyd Botanic Garden collected on the high levels of Sikkim both plants and seeds. In the Chumbi valley one of the garden collectors accompanied Mr. J. C. White, C.I.E., on a tour, and did some collecting along the route. In Assam the Botanical Survey was fortunate in having collections made on its behalf by Mr. A. Meebold, a German Botanist, during a journey across the Naga Hills to Manipur and thence to Silchar.

In Buima the Survey was unfortunate in its own collector. He was sent to the district of Pakdkku to collect material to serve as a northward continuation of the survey of Minbu district made in 1903. However, the inhabitants of Pak6kku appear to have considered the harmless enough operations of the plant collector as of a nefarious character connected in some mysterious way with a fancied poisoning of wells. The result was that collecting in Pak6kku came to an abrupt conclusion and the collector had to be recalled. Prom Pegu Mr. J. H. Lace, Conservator of Forests, contributed interesting and as usual excellently prepared collections. From Tenasserim very interesting and important collections continued to be contributed by the Forest Department. A thorough botanical survey of the district by a trained botanist, for several years in succession, would be likely to yield very interesting results, but at present there is unfortunately no officer available.

2. **Western India.**—Mr. G. **A.** Gammie collected in Bassein, Ahmedabad, Kaira, Surat, Khandesh, Ahmednagar, Poona, Belgaum and Dharwar. His report is appended. In addition to those official collections, Mr. G. M. Ryan, of the Forest Department, has completed his collection of plants of the Thana district. .The same offiper has also collected largely in the Poona district during the year.

3. **Southern India.—**The time of the Government Botanist, Madras, is so largely taken up with agricultural and general economic work, that only very limited attention can be given to systematic survey work. What has been done during the year in the latter direction is detailed in paragraph 4 of Mr. Barber's Report as Government Botanist, a copy of which is appended. Mr. C. E. C. Fischer, Deputy Conservator of Forests, Coimbatore, although he has no official connection with the Botanical Survey, has done excellent work in his leisure, time and the Calcutta Herbarium is indebted to him for a rich and excellently prepared collection of Coimbatore plants.

4. **Northern India.**—Officially nothing whatever has been done. Mr. Meebold, however, the same gentleman who collected in Assam, made an extensive tour in the N.-W. Himalaya, chiefly in Kashmir. He was allowed all facilities for working in the Calcutta Herbarium, to which he has kindly presented a duplicate set of his collections. The bulk of them are being worked up at Breslau, and already several novelties have been discovered.

5. **Publications.—**during the year there was issued No. 2 of Volume IV of the Records of the Botanical Survey of India, forming Part II of *An Epitome* ***of the British Indian species of Impatiens*** **by Sir J. D. Hooker, G.C.SI.** Part II of Volume II of Dr. Cooke's *Flora of the Presidency of Bombay* bringing the work up to the natural order Verben^ce© has appeared during the year. Amongst other publications not immediately connected with the Botanical Survey as a Department, the more important are:—*The Aconites of India* with 21 plates, a monograph by Dr. 0. Stapf, principal Assistant in the

Kew Herbarium, forming Part II of Volume X of the Annals of the Royal Botanic Garden, Calcutta, and a very valuable contribution to the study of eystematic Botany; Sir George King and Mr. Gamble's *Materials for a Flora, of the Malayan Peninsula,* Nos. 16, 17,18 in the Journal of the Asiatic Society of Bengal; an interesting series of papers in the *Indian Forester* by Mr. W. A. Talbot, Conservator of Forests, Bombay Presidency, on *The Distribution of the Forest Flora of the Bombay Presidency and Sind ;* **several articles in the** same journal on *Indian Forest Fungi* by Dr. E. J. Butler ; a series of papers on the *Orchids of the Bombay Presidency* by Mr. G. A. Gammie in the Journal of the Bombay Natural History Society. A list of papers published during the yeai? is appended to this report.

6. **Economic Botany.**—The study of economic problems forms no part of the work of the Botanical Survey as such, but has nevertheless taken up most of the time of the officers composing it in their capacities as Economic Botanists to the various Local Governments. Their economic work is fully detailed in the individual report of each officer, and it seems unnecessary to repeat their accounts here, Economic work, however, comes under the consideration of the Director in an advisory capacity, and in this last the Acting Director, in association with the Inspector-General of Agriculture and the Reporter on Economic Products, has submitted to Government reports on such subjects as the growing of flax for fibre in India, the investigation of the causes of lathyrism, the improvement of Indian cotton; and in association with the Inspector-General of Forests and the Reporter on Economic Products reports on the utilisation of Indian timbers for railway sleepers, the production of creosote, and the manufacture of wood pulp for paper making.

7. Staff.-^jieutenant-Colonel Prain, I.M.S., was on furlough throughout the year, during the whole of which Captain A. T. Gage, I.M.S., officiated. The other officers of the Survey held charge of their respective posts throughout the year.

A. T. GAGE, ***Captain, I.M.S.,***
Acting Director^ Botanical Survey of India-

Eeport on the Botanical Survey Operations in the Bombay Presidency for the year 1905-06 by G. A. Gammie, Economic-Botanist, in charge of the Botanical Survey of the Bombay Presidency.

I held charge of the Botanical Survey operations throughout the year.

1. TOURS.—*As* the greater part of my time was devoted to investigations in Economic Botany and to the organization and supervision of the Ganeshkhmd Botanical Gardens, and the Botanical Garden and Experimental Farm at Bassein, the following districts only were visited and survey operations conducted in them *in* coujunction with other duties:—Bassein and the surrounding country, Ahmedabad, Kaira, Surat, Khandesh, Ahmednagar, Poona, Belgaum and Dharwar. An exhaustive enquiry was made into the distribution of the various forms of wheat under cultivation throughout the Presidency, and the results will be summarized as soon as possible in separate reports.

Special researches were carried out on behalf of Sir George Watt on an edible species of Cyperus and several species of the same genus, which yield perfumes; for Dr. T. Oooke, information and specimens were obtained of some doubtful plants. Many references were dealt with regarding the identification of plants and in many cases also their economic uses.

2. HERBARIUM.—The following sheets were added during the year : —

Specimens collected departmentally	. . . .	2,480 sheets.
„ presented by Dr. T. Cooke, C.I.E.	. . .	2,412 „
„ Calcutta Herbarium	. . .	55 „
Total	.	4,947 „

Tl:e specimens presented by Dr. T. Cooke are particularly valuable as they form part of the material on which he is elaborating a Flora of the Bombay Presidency. Mr. G. M. Ryan has completed his collection of Thana plautsand we are conjointly drawing up a paper on the Flora of the district. Since his transfer to the Poona district he has collected many specimens during his tours and these will also be used ultimately in the preparation of another paper.

3. PUBLICATIONS.—Another number of the Flora of the Bombay Presidency has been issued by Dr. Cooke bringing the account down to Verbenacese. I published three parts of an account of the orchids of the Bombay Presidency in the Journal of the Bombay Natural History. A revision of my paper on the Indian cottons was published by the Inspector General of Agriculture and a set of coloured plates and photographs were submitted for a new edition. Various botanical notes were also supplied to the Journal of the Agri-Horticultural Society of Western India.

4. ECONOMIC WORK.—As this was conducted mainly in the Ganeshkhihd Botanical Gardens and on the Experimental Farms, details will be furnished in my report as Economic Botanist.

5. SlSAL.—Six plants flowered during the year and produced 9,545 bulbils. Nearly 20,000 bulbils were distributed for *experimental* purposes *to* many applicants,

6. ESTABLISHMENT.—Mr. B. K. Bide, senior Assistant Economic Botanist, was in charge of the Office and Herbarium of the Survey during the year. He worked with his usual industry and intelligence and his skill as an artist is of the greatest value to me. Mr. Gharade and Mr. Khomne, the plant collectors, worked well during the year.

G. A. GAMMIE,

Economic Botanist %nd Officer in charge.
Botanical Survey of Bombay.

COLLEGE OF SCIENCE,
POONA ;
***The** 22nd June 1906.*

O. I. C. P. **O.-No.** 4 D. B. S. I.—3O-7-1906.-5O. W, S. D'B.

Extract, paragraph 4, from the Report of the Government Botanist, Madras, for the year 1905-06.

4. The work in *Systematic Botany* has been of a varied character. The whole collection has been kept thoroughly cleaned during the year. The sheets " not yet added to the herbarium " have been completely rearranged for ready reference. This necessary work was somewhat laborious as the number has now reached over 10,000 sheets. A very large number of sheets have been mounted during the year. Of these the chief collection was that of *peppers* with 679 sheets while the *balsams* numbered 115. Of other plants 3,825 sheets were mounted, bringing up the total to 4,619.

The *balsams (Impatient)* received some attention and further collections were forwarded to Sir Joseph Hooker for determination. The results were unexpectedly interesting in that some ten new species were discovered to occur in South India.

The *sandal (Santalum album)* flora collected in the typical Mysore zone was worked out by the assistant.

. A very large number of *peppers (Piper nigrum)* was collected and worked out by the Government Botanist, chiefly from the Nilgiris, the Tambracherry ghaut and the Wynaad, the Palnais and the Anamalais. Valuable drawings of the more important species were added to the collection.

The flora of the Taliparamba farm received marked attention, the trees and shrubs growing on the farm being collected and named.

A collection of the different species of *barberry (Berberś)* was made for Mr. Drummond, I.C.S., chiefly from the Nilgiris, and a set of the seeds of *sundew (Drosera)* was obtained for an American correspondent.

The whole collection of *Gentians (Gentianacece)* was forwarded to the Reporter on Economic Products for naming. Part of the collection of ebonies *(Diospyros)* sent to Calcutta for the same purpose was returned. The *Lemon grasses (Andropogon Schoenanthus* and *A. Nardus)* were also forwarded to Calcutta and afterwards to Kew for similar treatment.

A special expedition was undertaken to the Travancore hills for the collection of germination stages of *Ochlandra travancorica.* This was done at the instigation of Sir Joseph Hooker, and the results were the formation of a very fine collection in spirit of all stages, which was forwarded to Dr. Stapf at Kew.

A special 9tudy was made of the Madras *root-parasttes* and their hosts, the latter being named by the assistant. A very large collection of the roofc connections (haustoria) was made in spirit for future work. This was chiefly of *Santalum, Osyris, Thesium, Olax, Cansjera* and *Ximenia.* A first paper on the sandal haustoria was sent to the editor of the Pusa Memoirs in September.

Numerous minor lots of plants were named for correspondents, largely Forest officers, during the year. Among these was a setf of plants forwarded by the Collector of Malabar from the *Laccadives.*

Two hundred sheets of plants were forwarded to the Director of the Botanical Survey for incorporation into the local floras of the Calcutta Herbarium, and forty Calcutta sheets were received in exchange from him.

G. I. C. P. 0.—ffo. * D. B. 8.1.—3'·-M906—50.-J. A.

APPENDIX TO BOTANICAL SUEVEY OF INDIA REPORT FOR 1905-06.

A list of Papers bearing on the Botany of India published during 1905-06.

BARBER, C. A.	. The Haustoria of Sandal roots. *Indian Forester, XXXI No. 4, p. 189, with 5 plates.*
BIRBAL, BABU	, The Ripening of Cones of Pinus longifolia. The formation of Pseudo-cones or Galls. *Indian Forester, XXXI, No. 8, p. 425.*
BLATTER, E.	. The Mangrove of the Bombay Presidency, and its Biology. *Journ. Bombay Nat. Hist. Soc. XFI, No. 4, p% 644, with. 2 plates.*
BLATTER, E.	# The "Pectinate organs" of Trapa bispinosa, Roxb. *Journ. Bombay Nat. Hist. Soc. XVII, No. 1, p. 84, with a plate.*
BUTLER, E. J.	• Some Indian Forest Fungi. *Indian Forester. XXXI, Nos. 10, 11,12, pp. 548, 661, 670.*
COOKE, T.	. The Flora of the Presidency of Bombay, Vol. II, Part II.
"DUTHIE, J. F.	. A new species of Diospyros. Diospyros Kanjilali. *Indian Forester, XXXI, No. 6, p. 307, with plate.*
FINET ET GAGNEPAIN	. Espfeces nouvelles de TAsie Orientale. *Bull. Soc. Bot. de France, LJII, No. 2, p. 125.*
FINETET GAGNBPAIN	. Contributions a l'etude de la flore de l'Aeie Orientale. *Bull. Soc. Bot. de France, Memoire 4, 1905.*
GAGE, A. T.	« Eugenia praetermissa, a hitherto undescribed species from Assam and Burma. *Indian Forester, XXX11, No. 1, p. 6, with plate.*
GAGE, A. T.	; Hedyotis sisaparensis, a hitherto undescribed Indian species. *Journ. Asiat. Soc. Bengal', I, No. 9, 1905.*
GAGNEPAIN, F.	• Zingiberacees nouvelles de l'herbier du Museum. *Bull. Soc. Bot. de France, LJIÍ No. 2, p. 132.*
GAMMIE, G. A.	. The Orchids of the Bombay Presidency, Part II. *Journ. Bombay Nat. Hist. Soc. XFI, No. 4, p. 562, with plate.*
HOOKER, SIR J. D.	An Epitome of the species of Impatiens of British India, Part II. *Records Bot. Survey, India, IF, No. 2.*
KING, SIR G., & GAMBLE, J.S.	Materials for a Flora of the Malayan Peninsula, Nos. 16, 17, 18. *Journ. Asiat. Soc. Bengal, I, Extra Number, 1905.*
LEAL, F.	• The Origin of Anonas. *Anona squamosa* L., *Anona reticulata.* L. *Journ. Bombay Nat. Hist. Soc. XVII, No. 1, p. 195.*
XMAYES, W.	. Note on the occurrence of a parasitic fungus on Pinus excelsa. *Indian Forester, XXXI, No. 7, p. 369.*
OSTENFELD, C. H.	m• A List of plants collected in the Raheng District, Upper Siam* *Bull. I'Herb. Boissier, 2nd Ser., 1905, No. 8, p. 729.*
X PIERRE, L.	. Plantes nouvelles de l'Asie tropicale. *Bull. Soc. Bot. de France. LII, No. 7, p. 490.*
PRAIN, D.	. The species of Meconopsis. *The Gard. Chronicle, XXXFIL No. 964, p. 369.*
ERATN, D.	. The Genus Ceratostigma. *Journ. of Botany, XL IF, No. 517, p. 4.*
'^TRAIN, D.	» Mansonieaa, a new Tribe of the Natural Order Sterculiace®. *Journ. Linn. Society, XXXVII, No. 259, p. 250, with plate.*
RAO, M. RAMA	, Chickrassia tabularis. *Indian Forester, XXXII, No. 2, p. 55.*
SCHLECHTER, R.	, Neue Orchidaceen de Flora des Monsun-Gebietes. *Bull. I[9]Herb., Boissier, 2nd Ser., 1906, No. 4, p. 295.*
^ SCHNEIDER, C. K,	Die Gattuing Berberis (Euberberis), *Bull. I'Herb. Boisrier, 2nd Ser., 1905.*
SPIRE, DR.	. Contribution a Te'tude de la flore Indo-Chinoise. *Bull. Soc. Bot. de France, LII, No. 7, p. 551.*
STEBBING, E. P.	On the Cecidomyid [Cecidomyia (?) sp.] forming the Galls or Pseudo-cones on Pinus longifolia. *Indian forester, XXXI, No. 8 p. 429.*
STAPF, O.	The Aconites of India. *Annals Royal Bot. Garden, Calcutta, vol. X_f part II, with 24 plates.*
TALBOT, W. A.	The Distribution of the Forest Flora of the Bombay Presidency and Sind, *Indian Forester, XXXII, Nos. 1, 2, 3, pp. 8, 56, 126.*
WILLIAMS, F. N.	Liste des Plantes connues du Siam. *Bull. I'Herb, Boissier, 2nd Ser., 1902, pp. 428, 949.*

G. I. C. P. O.-No. 4 D. B. S. I. — 3O.7.19O6,-6O.- C. T.

Report of the Director of the Botanical Survey of India for the year 1906-07.

1. Eastern India.—BENGAL.—In the Sunderbuns collections were made of species of *Sonneratia, Carapa, Kandelia, Ceriops, Bruguiera, Meretiera,* etc, which are specially interesting on account of their morphological modifications characteristic of such an estuarial flora. In Chota Nagpur, plants of various monocotyledonous genera were collected by men working under the supervision of the Reverend Father Cardon, S.J. In the Darjeeling district and in Sikkim, collections both of plants and seeds were made as usual. Another collector made a special collection of water liliés in the Midnapore district.

EASTERN BENGAL AND ASSAM.—An Indian collector was sent to the district of Mymensingh, where he spent some time, making as representative a collection as time would allow of the flora of that district.

BURMA,—By the kindness of Mr. I. H. Burkill, M. A., F.L.S., Reporter on Economic Products to the Government of India, a collector of the Botanical Survey was attached to him during his tour in the district of Arracan. The vegetation of this district is very imperfectly known, so that interesting results are anticipated from the collection, when once opportunity of working it up occurs. As usual the officers of the Tenasserim Forest Circle contributed interesting and excellent specimens from Lower Burma. A fair collection of orchidaceous and other monocotyledonous plants was obtained from the Shan Hills.

2. Western India.—Pressure of other duties prevented the officer in charge of the Botanical Survey of Western India from making any tour solely in the interests of the Botanical Survey, although in his capacity as Economic Botanist to the Government of Bombay, he toured in the Karnatak and Gujarat. Mr. Gammie's Report is appended *in extenso.*

3. Southern India.—The official work in connection with systematic Botany is detailed in the Report of the Government Botanist, Madras, paragraph 5, a copy of which is appended. JVlr. 0. E. C. .Fischer of the Forest Department continued his investigations of the Flora of Coimbatore and contributed largely to the Calcutta Herbarium.

North-West India.—There being no official arrangements for conducting systematic investigations in Northern India, what work has been done has been performed by individuals unconnected wirh the Botanicnl Survey. A considerable amount of collecting work has been done in Baluchistan, chiefly for economic reasons and the collections themselves have been worked up in the Calcutta Herbarium by Mr. I. H. Burkill. A collection of plants from Koweit, collected by Captain Knox, the Political Agent there and forwarded by Mr. J. G. Lorimer, I.C.S., C.I.E., have been worked out as far as possible. An excellent collection of plants from the N.-W. Frontier district of Bannu was presented by Mr. James Marten of the Forest Survey Department, while the Survey is indebted to Mr. A, R. Tucker of the Revenue and Agricultural Department for a fine collection of North-West Himalayan plants.

Publications.—Of the Records of the Botanical Survey there was issued No. 3 of Vol. IV forming the concluding part of Sir Joseph Hooker's *Epitome of the British Indian Specif8 of Impatiens.* **Another nujnber embodying** descriptions of new species of *Sapindacece* by Professor Radlkofer of Munich was in the Press at the end of the year. Dr. Cooke's *Flora of the Presidency of Bombay* has advanced a further stage, Part III *of Vol. II being: published during the year, bringing the work down to the end of *Euphorhiacece.* Since last report, Part II of Vol. IX of the Annals of the Royal Botanic Garden, Calcutta, **being a Monograph of the *Orchids of the North-West Himalaya* by** Mr. J. F. Duthie, B.A., F.L.S., formerly Director of the Botanical Department of Northern India and now at Kew, has appeared. This volume comprises descriptions of all the orchids of the North-West Himalaya, with keys to facilitate the identification and 58 plates of those species which are not or only

unsatisfactorily figured elsewhere. Two other volumes of the Annals are also in the Press and nearing completion. An important work on Indian Trees by the late Sir Dietrich Brandis, K.C.I.E., appeared just a short time before the death of its illustrious author. The other publications which appeared during the year are given in the list appended to this report.

General.—In October and November 1906 the Director visited the Botanical Institutions and Gardens of Southern India, and in February and March 1907 made a similar tour through Upper India. A special report on the present state of the Botanical Survey Department, and proposals for its reorganisation on a proper footing have been recently submitted to Government.'

Staff.—Captain A. T. Gage, I.M.S., officiated as Director until 30th July 1906, and on the retirement of Lieutenant-Colonel D. Prain, I.M.S., F.R.S., C.I.E., was confirmed in the post from 30th July 1906.

A. T. GAGE,

Director, Botanical Survey of India.

Report on the Botanical Survey operations in the Bombay Presidency for the year 1908-1907 by G. A. Gammie, Economic Botanist, in charge of the Botanical Survey of the Bombay Presidency.

The Economic Botanist toured in the Karnatak and Gujrat but, owing to pressure of other duties, no tour could be undertaken solely in the interests of the Botanical Survey. Arrangements are being made during the succeeding year for the establishment of continuous research work by himself and his assistants.

1. THE HERBARIUM.—Numerous specimens were added to the Herbarium during the year. The chief contributors were Dr. Cooke, who presented 1012 sheets from his own Herbarium. Mr. Ryan presented collections made by him during his tours in the forest areas of the Poona District. The remainder was collected by the Economic Botanist and his assistants. 274 sheets were presented to the Bombay Natural History Society.

2, PUBLICATIONS.—Dr. Cooke, C.I.E., has published another number of his Flora of Bombay, bringing the account down to the end of *Euphorbiacece.* The Economic Botanist supplied an account of the vegetation of Bombay Island for inclusion in the forthcoming Gazetteer; a further instalment of his notes on the Orchids of the Bombay Presidency to the Bombay Natural History Society; a revised account of Indian Cottons and a note on American Tree Cottons to the Inspector General of Agriculture in India. A botanical account of the field, garden, and Orchard crops of the Presidency has been drawn up and will be submitted for publication at an early date.

The collection of specimens of the indigenous fodder grasses has now been completed. The Economic Botanist has been generously assisted in this work by a great number of district officers. The working up of this material is now taken in hand and the results will be ready for publication during the ensuing year.

3. SISAL.—Seven plants flowered during the year and produced 14,780 bulbils. These have been reserved for distribution to applicants.

4. STAFF.—Mr. U. K. Bhide, Assistant Economic Botanist, has been in executive charge of the Herbarium during the year. He has worked steadily and well and has made fair progress in figuring dissections of the indigenous grasses. Messrs. Earade and Khomne, the Plant Collectors, have also performed their duties to my satisfaction.

G. A. GAMMIE,

*Economic 'Botanist, in charge Botanical Survey**

Bombay Presidency.

GANESHKHIND BOTANICAL GARDENS,

KIRKEE ;

The 4th July 1907.

Extract, paragraph 5, from the Report of the Government Botanist, Madras, for the year 1906-07.

5. WORK OF THE SYSTEMATIC ASSISTANT.—The Systematic Assistant attended also to the duties of the Economic Assistant and to the general management of the office during Mr. Barber's tour. Owing to illness, he could not spend more than 27 days on tour. He identified grasses sent by several officers, and 2,000 plants of Mr. Barber's collection including all the host plants of *Olax scandens*, a root parasite of the prickly-pear, etc. In October, he explored the Nallamalais to find new kinds of haustoria, collected at Digunametta many root connections of *Ximenia americana*, discovered a new root parasite, *viz.*, *Opilia amentacea* of the order of Olacineæ and made also a general botanical collection. The tour on the Nallamalais lasted about three weeks. The naming of the barks collected on the Anamalais and of the grasses collected in South Canara was finished. He contributed notes on sundry botanical subjects to the Reporter on Economic Products, the Director of Agriculture, etc., and also assisted Professor Fyson of the Presidency College. While he was preparing for a tour in the Travancore forests he was attacked with malarious fever. The Director of the Botanical Survey of India inspected the Botanical collections in the office on the 12th October 1906.

4 list of Papers bearing on the Botany of India mostly published during 1906-07.

BEER, U. • *On* the development of the spores of Helminthostachys zeylanica

BERGTHEIL, D. J. *Ann. of Bot., xx, 1906, pp. 177—186, with 2 plates.*

" The cause of " Hardness " in the seeds of Indigofera arrecta *Ann. of Bot., 1907, pp. 67—60.*

LATTE, M. • Flowering season and climate. *Journ. Bomb. Nat. Hist. Soc. xvii, 334, 697, with 5 plates.*

GRAND, A. . Additamenta nova ad cognitionem generis Symplocos *Bull Herb. Bois., vt, 1906, pp. 747—750.*

BEAN, SIR D. , Indian trees. An account of trees, shrubs, woody climbers, Bamboos and Palms indigenous or commonly cultivated in the iiritish Indian Empire. *London, 1906, p. xxxiv, 767, with many figures.*

BRANDIS, SIR D. , Remarks on the structure of bamboo leaves. *Trans. Linn. Soc, ™i 1907, pp. 69—92, with 4 plates.*

BRANDIS, SIR D. . Mastixia euonymoides, *Prain. Ind. For. xxxiii, 1907, p. 57, with 1 plate.*

BRANDIS, SIR D. , Phcebe Hainesiana, *Brandis,* n. sp. *Booh. Ic. Plant, ix, 4th Ser.f pt. I, 1906.*

BRANDIS, SIR D. , The spruce of Sikkim and the Chumbi Valley, *Ind. For. xxxiv 1906,pp. 579—581.*

BURKILL, I. H. . AJpine notes from Sikkim. *Kew Bulletin, 1907, pp. 92—94, with 1 plate.*

BURKILL, I. H. . Groa Beans in India. *Agri. Ledger, No. 4, 1906, pp 51—64.*

BURKILL, I. H. . The pollination of Thunbergia grandiflora *JRoxb.* in Calcutta; and the pollination of Corchorus in Bengal and Assam , and also the mechanism of six flowers of the North-West Himalaya. *Journ. Asiat. Soc. Bengal, ii, pp. 511—525, 1906.*

CANDOLLE, C. DE . Meliacese novsB vel iterum lecta et Eutacese novae. *Bull. Herb. Bois., vi, No. 12, pp. 981—986, 1906.*

CARANO, . Ricerche sulla moifologia delle Pandanacee. *Ann. di Bot., v% pp. 1—46, 1906, with 5 plates.*

CLARKE, C. B. , Reductions of the Wallichian herbarium. I Bignoniaceae; PedaliDeffl. *Kew Bulletin, 1907, pp. 16—18.*

II Gesneraceae. *Kew bulletin, 1907, pp. 16—18 and 94—97.*

COOKE, . The Flora of the Presidency of Bombay, Vol. ii, Part iii, *Verbenacea to Fuphorbiacea.*

DEMILLY, . Les plantes du genre Laportea *Gaudich.,* leurs caracteres, Ieur action urticante dangereuse. *Bull. Sc. Pharmacol; xiii, p . 144, 1906.*

DEY, SURENDRANATH # A short account of the seeds and oil of Cochlospermam *Gossypium. Agri. Ledger, 1906, pp. 65—68.*

DIELS, L. . Die primitivsfce Form von Lygodium. *Eedwigia, xliv, 1905, pp. 133-136.*

DIELS, L. . Droserace®. *Das Pflanzenreich, IV. No. 112, 1906.*

DOP, P. . Physiologic des mouvements des etamines de Mahonia nepalensis *DC. Bull. Soc. Bot. France, 1905, p. 136.*

DRABBLE, E. . The Transition from stem to root in some palm seedlings. *New Phytologist, v, 1906, pp. 56—66, with 7 figs.*

DRUMMOND, J. R. # Chlamyditeg: A new genus of Composite. *Kew Bulletin, 1907, pp. 90—92.*

DRUMMOND, J. R. & PRAIN, D. Notes on Agave and Furcrsea in India. *Bengal Agric Bulletin. No. 8,1906.*

DUTHIE, J. F. m The Orchids of the North-Western Himalaya. *Ann. Boy. Bot. Gard., Calcutta, ix, Part II, pp. i—", and 81—211, with 68 plates.*

FINET ET GAGNEPAIN. . Especes nouvelles de l'Asie Orientale. *Bull. Soc. Bot. France, liii,pp. 573—576, 1906, with fig.*

GAGE, A. T. . Bulbophjllum Burkilli, a hitherto undescribed species from Burma. *Journ. Asiat. Soc. Bengal, it, p. 343, 1906.*

GAGE, A. T, . The varieties of Bombax insigne *Wall,* in Burma. *l^A. For. xxxiii, No. 3, 1907.*

GAGE, A. T. . Wormia Mansoni: a hitherto undescribed species from Burma. *Journ. Asiat. Soc. Bengal, ii, 1906, p. 73.*

, GAGE, A. T. . Sketch of the Herbaceous Vegetation of Burma. *In Sir George Seott's " Burma,[39] 1906.*

GAGNEPAIN, F. . Zingiberacees nouvelles de l'herbier du Museum. *Bull* Soc Bot. France, 1906, liii, pp. 351—356.*

GAMBLE, J. S. . Gutta percha trees of the Malay Peninsula. *Kew Bulletin, 1907, No. 4,pp. 109—121.*

GAMMIE, G. A. . The orchids of the Bombay Presidency. Part iii, *Jonrn. Bom* Nat. Hist. Soc. xvii, 31, with plate.*

GATIN, C. L. . Nouvelle contribution a l'etude chimique de la germination du Borassus flabelliformis, *L. Rev. Gen. Bot., xviii9 216, pp. 481—483.*

GUENOT, J. P. , Contributions a 1'etude anatomique des Pittosporaceae. *These, Paris, 1906.*

GUERIN, P. . Cellules a mucilage des Dipterocarpees. *Bull. Soc. Bot. France, liii, pp. 443—451, 1906.*

HAINES, H. H. . On two new species of Populus from Darjeeling. *Journ. Linn* Soc, xxxvii, No. 262, pp. 407—409, 1906, with text figs.*

HEMSLEY, W. B. . Nepenthes Macfailanii, *Hemsl., Hook. Ic. Plant, ix, 4th Ser., pt. L, 1906.*

HILL, A. W. . A revision of the geophilous species of Peperomia, with some additional notes on their morphology and seedling structure. *Ann. of Bot., 1906, xxi, pp. 139—161, with 1 plate.*

<" HOOKER, SIR J. D. . Triomma malaccensis, *Hook. f., Hook. Ic. Plant, ix, 4th 8er*9 pt. I, 1906.*

HOOKER, SIR J. D. . Epitome of the British Indian Species of Impatiens. Part III- *Rec. Bot. Sur. Ind., iv, No. 3., 1906.*

HUTCHINSON, J. . Gentiana ornata. *Bot. Mag. Hi, No. 30, 1907.*

JAENSCH, O. . Beitrag zur Embryologie von Ardisia crispa, *A. DC. Dissert Breslau, p. 35, 1905.*

KANNGIESSER, P. . Blattziechnungen bei Oxalis acetosella. *Oartenfiora, 1906, p. 441.*

KINDERMANN, V. . Zur Anatomie und Biologie des Samens von Hydrocharis Morsus-ransB, *L. Lotos, Prag. Bd., xxvi, No. 4, 1906, pp. 105—109.*

' KRUYPF, E. DE , Quelques recherches sur la composition de Teau et sur les'diastases du fruit de Cocos nucifera. *Bull. DepU Agri. Inde* Neerland. 1906, No. 4, pp. 1—8.*

t MAHEN, J. . Sur les organes secreteurs des Me*nispermacees. *Bull. Soc. Bot. France, 1906, pp. 651—663.*

. MUTH, FR. . Untersuchungen iiber die Friichte des Hanfes. (Cannabis sativa *L.) Jahrbuch der Vereinig. Vertreter angewand. Botanii Berlin, 1906, pp. 76—122, with 1 plate.*

POND, R. H. . The Incapacity of the Pate endosperm for self-digestion. *A*n-of Bot., pp. 62—78, 1906.*

REED, H. S. & SMOOT, I. •*)The mechanism of seed-dispersal in Polygonum virginianum.

I SCHOUTE, J. C. . J *Bull. TorreyBot. Club, xxxiii,pp. 377—386, 1906.*

. Ueber die Verastelung bei monokotylen Baumen. I. Die Verastelung von Pandanus. *Ann. du Jard* Bot. de Buitenzorg* xx, pp. 53—87, 1905, with 27 fig*.*

* SOAVE, M. . II forro nella Trapa natans. *Ann. Ace. Agri. Torino., xlvHh pp. 409—415.*

^ SPLENDORS, A. . Sinossi descrittiva ed iconographica dei semi del genere Nicotiana* *Portici, 1906, p. 163, with 60 plates.*

* SPRENGEB, C. . Die Crinum Asiens. *Ost?rreich. Garten-Zeit. Wien, 1906> Heft 10, pp. 361—366.*

/ STAPF, O. . The Oil Grasses of India and Ceylon, *Kew Bulletin, 1906J pp. 297—363, with plate.*

J STOPSS, M. C. . On the double Nature of the Cocdean Integument. *Ann* of Bot. XIX, pp. 861—866, 1905.*

SVEDELIUS, N. % Reports on the Marine Algae of Ceylon, No. I. Ecological and Systematic Studies of the Ceylon species of Caulerpa* *Ceylon Marine Biological Reports, it, No. 4, 1906, pp. 81—144, with 51 figs, in text.*

SVEDELIUS, N. . Uber die Achnlichkeit zwischen der Marinen Vegetation Westindiens und des indiscben und stilien Ozeans. *Botaniska Notiser, 1906, pp. 49—57.*

TODD, F. H. . Pterocarpus dalbergioides. *Ind. For. xxxii, No. 12, ppl 581—587,1906.*

TREUB, M. , *1/* Apogamie de l'Elatostemma acuminatum *Brongn. Ann. du Jard. Bot. de Buitenzorg, v, 2 8er., pp., 141—152) 1905.*

VIOUIER, R. . Recherches anatomiques sur la classification des Araliacees. *Ann Sc. Nat. Bot iv, 1906, pp. 1—208.*

WALTER, H. . Die Diagramme der Phytolaccaceen. *Engler's Bot. Jahrl., xxxvii, 1906, 4th Heft. Beibb. 85, pp. 1—57.*

WEHNERT, A. . Anatomisch—systematische Untersuchung der Blatter der Gattung "Symplocos." *Diss. Munchen, 1906, p. 57.*

WILLIAMS, F. N. . On the genus Clarkella (Rubiaceae). *Journ. of Bot,, xliv, pp. 377-379,1906:*

WILLIS, J. C. . The Progress of Botanical and Agricultural Science in Ceylon. *Science Progress, if pp. 308—*324,1906.*

YAPP, R. H. . Fruit-dispersal in Adenostemma viscosum. *Ann. of Bot., xx, 1906\ pp. 311—316, with plate.*

Q. 1. C. P. (fc-tfo. 2 D. B. S. I.-*8.8-1907,-5l-B. N. D.

Report of the Director of the Botanical Survey of India for the year 1907-08.

Eastern India.—BENGAL.—Collections were made from several localises, chiefly of seeds required for various parts of India and for abroad. A pegmning was made of a photographic survey of the chief types of vegetation m the province.

The usual collections of both plants and seeds were made in the Darjeeling district and in Sikkim and these were distributed chiefly to European and American Botanic Gardens and Herbaria. Captain F. H. Stewart, I.M.S., made a large collection of Tibetan plants in the neighbourhood of Gyantse and these—over 1,000 in number—he generously presented to the Calcutta Herbarium and they are now under examination. Mr. I. H. Burkill contributed Plants collected on the Singlela ridge.

EASTERN BENGAL AND ASSAM.—Herr A. Meebold visited various districts on behalf of the Survey and obtained valuable collections from this area, Native collectors forwarded specimens chiefly *Orchidece* from Manipur and neighbourhood.

BURMA.—Herr Meebold collected in various localities from Eangoon to Mandalay and his specimens are now being worked up and incorporated in the Herbarium. Mr. I. H. Burkill contributed to the Herbarium from his collection of Arraean specimens* Interesting specimens continue to be received from Forest Officers, and further collections of *Orchidece* were obtained from the Shan Hills.

2. Western India.—The report of the Government Botanist is appended.

3. Southern India.—Extracts from the report of the Government Botanist, Madras, are appended. Mr. O. E. C. Fischer of the Forest Department forwarded to the Calcutta Herbarium collections made in North Coimbatore and North Malabar. Mr. I. H. Burkill sent a collection of Deccan grasses.

North-West India.—tVom this area the Survey is indebted to the following for valuable contributions :—

Sir H. A. Deane, K.C.S.I., Chief Commissioner of the North-West Frontier province, forwarded several collections from Peshawar and Afghanistan; I- BL Burkill, a series of Baluchistan plants, collected by the Gazetteer staff under the direction of Mr. R. Hughes Buller, I.C.S., and a collection from Simla; Colonel J. M. Carpendale, plants from Kashmir; Mr. James Marten of the Forest Survey Department, plants from Bannu; Mr. T. F. Main from Umballa ; Mr. A. B-. Tucker of the Department of Revenue and Agriculture, a further collection of North-West Himalayan plants.

Of the more important foreign contributions bearing on Indian Botany may be mentioned collections from Turkestan, the Philippines, Siam, and the Andamans.

Publications.—Of the Records of the Botanical Survey there were published No. 3 of Vol. Ill (Professor L. Radlkofer's *Sapindacea nova indices et malaica,* and of No. 4 of Vol. Ill (Professor C. deCandolle's *Revision of the Indo*Malayan species of Oedrela).* **No. 5 of Vol. Ill, an index complet**Bg the volume, is now in the Press and should shortly appear.

Another part of Dr. Cooke's *Flora of the Presidency of Bombay* has been issued bringing the work down to the beginning of *Aracece.*

The two volumes of the Annals of the Royal Botanic Garden, Calcutta—Vol. VI, part 2, Messrs. West's *Fresh Water Alga from Burma,* and Vol. XI, part I, Professor Beccari's *Monograph of the species of Calami,* reported last year as still in the Press, have not yet been issued but should both appear Y^hin six months. Parts 19 and 20 of Sir George King and Mr. J. S. Gamble's ***Materials for a Flora of the Malayan Peninsula*** **were issued and bring the** Work to the end of *Plantaginea.*

The other publications on Indian Botany published during the year are given in the list appended to this report.

Staff.—Captain A. T. Gage, I.M.S., Director of the Botanical Survey of India, held charge until 14th March 1908. He then went on privilege leave, and Mr. W. T9. Smith, Curator of the Herbarium, officiated until the end of the financial y< ar.

W. W. SMITH,

*Officiating Director, Botanical Survey of India**

Report on the Botanical Survey operations in the Bombay Presidency for the year 1907-1908 by Mr. G. A. Gammie, Economic Botanist, in charge of the Botanical Survey of the Bombay Presidency,

TOURS.—Mr. H. M. Chibber, Assistant Professor of Botany, toured through Kathiawar, Pauch Mahals, Ahmedabad, Khandesh, Satara, and Belgaum districts. Messrs. R. K. Bhide, G. B. Patwardhan, and Jff. P. Paranjape, Assistants to the Economic Botanist, toured through Belgaum, Eatnagiri, Thana, Nasik, Ahmednagar and Poona Districts, the junior staff, Messrs. L. D. Garade, L. R. Khomne, 8. R. Jogadeo and R. G. Jawlekar accompanying them.

HERBARIUM.—The following is the number of specimens collected and incorporated into the Herbarium :—

	Specimen!.
Collected by -	
Mr. G. A. Gammie.	.968
Mr. H . M . Chibber	1,432
Messrs. Bhide, Patwardhan, and Paranjape	2,858
Presented by Dr. T. Cook.	.906
TOTAL	6,164,

The following is the number of specimens distributed:—

	Sheeti.
Presented to the Bombay Natural History Society . . .	104f
Presented to the Perg-ussou College, Poona	306
Presented to the Yokohama Specie Bank, Limited . . .	7
TOTAL .	417

PUBLICATION.—Dr. T. Cooke, C.I.B., has published another number of his Flora of Bombay bringing the account down to the end of *Typhacete.*

A further note on the Orchids of the Bombay Presidency was supplied to the Bombay Natural History Society. A note on the introduction of American Cottons in the Bombay Presidency was supplied to the Inspector-General of Agriculture in India and a note on the Setarias was also supplied to the same officer. A note on the Flora of Thana is almost ready for publication. The specimens of the indigenous fodder grasses kindly supplied by the several district Officers of the Presidency have nearly all been identified together with the millets under cultivation and descriptions accompanied by drawings of them will shortly be published.

gTAPE 3^r- Bhide, Assistant Economic Botanist, has been in charge of the Herbarium throughout the year. Mr. Paranjape has also assisted him in clearing up arrears.

G A GAMMIEj

Economic Botanist^ Bombay\ Poona.

Extracts from the Annual Report of the Government; r»otanist, Madras, 1907-1908.

[99] Mr. (now Dr.) C. A. Barber continued to be on leave in England and the Director of Agriculture was in charge of the olfioe for one month in the beginning of the year. On the 1st May M. B. By. Kao Bahadur C. K. Subba Row Avargal took charge as Acting Government Botanist and continued in this capacity for the rest of the year. In his untimely death, which has just been reported, the department has sustained an irreparable loss. His knowledge of the agriculture of the Presidency was unequalled, and he had the gift of acquiring the confidence of the agricultural classes in a unique degree."

[Ci] The flora and fauna of the Kolair lake were studied, and even though the monsoon there was a failure " Alliyalu " *(Nymphwa Lotus)* largely used as a food by some classes was found to grow extensively, and the best economic use of its seeds noted and a short report written on it."

" During the year two papers of Dr. Barber (on leave) on studies in root parasitism—(1) Haustorium of *Santalum album,* part II, and (2) Haustorium of *Olax sea nd ens*—were published in the Botanical series of the Agricultural memoirs."

" WORK IN SYSTEMATIC BOTANY.—The Systematic Assistant was on leave on medical certificate during the first nine weeks of the year owing to a severe attack of the Nallamalais fever, and on joining duty he attended to the thorough cleaning of the Herbarium collections and office in general and to the preparation of a full list of the host plants of different root parasites for forwardal to Dr. Barber in England."

" Seeds of the following root parasites were sent to Dr. Barber in England for experimental sowing and special study :—*Santalum album* from Mysore, *Olax scandem* from Palur, *Ximenia* and *Opilia* obtained from the Nallamalais forests and lastly *Cansjera Rheedii* collected by the Assistant in the Madura and Tinnevelly lower hills."

" About the end of the official year the Madura and TinnevelJy lower hills were visited for re-examining the root system of *Cansjera Rheedii* and collecting its fruits. In this tour *Olax TP'ightiana* was also found to be a root parasite.

The Assistant was *ou* tour for 119 days, of which 104 days were spent in the study and collection of grasses in the Circars and 15 days in Tinnevelly and Madura hills regarding *Cansjera.*

No special systematic survey was made owing to the absence of Dr. Barber in England."

APPENDIX TO BOTANICAL SUEVEY OF INDIA BEPORT FOR 1907-08.

A list of papers on the Botany of India published during 1907-08.

ANONYMOUS — . Patchouli. *(Kew Bull., 1908, p. 78.)*

ASCHERSON P. UND P. GRAEBNER. — Potamogetonaceae. *(Das Pflanzenreich. xxxi, p. 184, with plates, 1907.)*

BARBER, C. A. — . Parasitic trees in Southern India. *(Proc. Cambridge PUlos. Soc., xiv, 3, pp. 246—256, with plates.)*

BARBER, C. A. — . Studies in root parasitism. The Haustorium of *S ant alum album,* part *2,* the structure of the mature Haustorium and the inter-relations between host and parasite. *(Memo. Dept. Agri. India, i, 1, 2, pp. 1—58, with plates.)*

BARBER, C. A. — . The Hanstorium of Olax Scandens. *(Memo. Dept. Agri. India, 1, No. 4.)*

BEDDOME, R. H. — . Notes on Indian Ferns. *(Journ. Bom. Nat* Hist. Soc, xviii, 2, pp. 338-342,1903.)*

BLATTER, E. — . Contributions to the Flora of North Coimbatore. *(Journ. Bom' Nat. Hist. Soc, xviii, 2, pp. 390—429,1907, with map.)*

BLATTER, E. — • Acta et agenda by the Bombay Botanists. *(Journ. Bom. Nat. Hist. Soc.y xvii, 3, pp. 562—577, 1907.)*

BLATTER, E. — . Cassia renigera, Wall. *(Journ. Bom. Nat. His. Soc, xvii, 4, pp. 1036—1037, with plates, 1907.)*

BLATTER, E. — . Flowering season and climate. Part II, 1907- *(Journ. Bom. Nat. His. Soc, xvii, 3, pp. 697—708, with plates.)*

BONATI, G. — . Les Pediculaires de Chine de M. Wilson dans l'harbi^r du Museum de Paris. *(Bull. Soc. Bot. France T. Uv, pp. 183—188,1907.)*

BONATI, G. — . Sur quelques eppèces nouvelles du genre Pedicularis. *(Bull. Soc. Bot. France T. Uv, pp. 371—377, June 1907.)*

BURKILL, I. H. — , A note on Swertia tcngluensis, and on a new variety of Swertia purpurascens. *(Journ. and Proc Asiat. Soc, Bengal, Hi, 1, p. 33, 1907.)*

BURKILL, I. H. — . On Gentiana coronata, Boyle. *(Journ. and Proc. Asiat. Soc, Bengal, iii, 3, p. 149, with plates.)*

BURKILL, I. H., AND FINLOW, R. S. — On three varieties of *Corphorus capsularis,* Linn., which are eaten. *{Journ. and Proc. Asiat. Soc, Bengal. Hi. 10. 1907. p. 633.)*

BURKILL, I. H. — . Note on the Pollination of flowers in India. Note No. 4 on Cotton in Behar. *(Journ. Asiat. Soc, Bengal. HI, 7 July 1907.)*

BURKILL, L.H. — . Anguillicarpus— a new genus of the Cruciferse, *(Journ. and Proc Asiat. Soc.} Bengal, N. S., Hi, 8, pp. 559—561, with plates, 1907.)*

BURKILL, I. H. — . A variety of Ducrosia anethifolia, Boiss, from Baluchistan. *(Journ. and Proc Asiat. Soc, Bengal, N.S., Hi, 8, pp. 563~m 564, 190?\ with plates.)*

BUTLER, E. J. — . Beport on Coconut palm Disease in Travancore. *(BulU Research Institute, Pusa, No. 9, 1908.)*

BUTLER, E. J., AND LEFROY, H. M. — Report on trials of the South African Locust Fungus in India. *(Bull. Agri. Research Inst., Pusa, 1907, 5, pp. 1—5.)*

BUTLER, E. J. — \ Some diseases of cereals caused by *ScUrospora graminicola* Schroet. *(Memoirs of the Dept. Agri. in India, Vol. II, No. 1, March 1907, pp.* 19 with plates.)*

CAMERON, J. — . List of Botanical drawings in water colour in the collection of the State Botanical Gardens, Lai Bagh. *(Bangalore, 1907, pp. 56.)*

CANDOLLE, C. DE — . A revision of the Indo-Malayan species of Cedrela. *(Rec. Bot. Surv.Ind.,iii,pt.4,1908.)*

CLARKE, C. B. — . Beductions of the Wallichian Herbarium, iii, Cyperacese. *(Kew Bull. 1907, 7,pp. 261-281.)*

COOK, T. — . The Flora of the Bombay Presidency, ii, pt, iv. Euphorbiacea to Araceae, pp. 625—816.

COTTON, A. D. — New or little known marine algse from the East. *(Kew Bull. 7, 1907, pp. 260—264, with plates.)*

DRUMMOND, J. R. — Literature of Furcrsea with Synopsis of the known species. *(St. Louis Rep. Bot. Gard., 1907, with plates.)*

ELLIS, E. V. — Cephalostachyum pergracile in flower. *(Indian Forester, xxxw, 7, pp. 323—324, 1907.)*

ENBBS, D. T. — The evergreen forests of the Maunjarabad Forest Range, Mysore State. *(Indian lorester, xxxiii, 7, pp. 324—328, 1907.)*

FINLOW, R. S., AND BEBGTHEIL, C. J. — A Method for producing immediate germination of " Hard coated seeds." *(Jonrn. and Proc. Asiat. Soc, Bengal, Hi, 10th Deer. 1907, p. 625.)*

FISCHEB, C. E. C. — Host plants of Loranthacese. *(Indian Forester, xxxiii, 8, pp» 353-355,1907.)*

FISOHBB, C. E. C. — Summary of genera and species described in the Flora of British Indik. *(Indian Forester, xxxiii, 8, pp. 355—362, 1907.)*

FISCHBB, C. E. C — A remarkable fruit. *(Journ. Bom. His. Soc, xviii, pp. 1027, 1907.)*

FLETCHEB, T. — Note on a toxic substance excreted by the roots of plants. *(Memo. Dept. Agri. India, II, No. 3.)*

FUITSCH, F. E. — A general consideration cf the Subserial and Fresh-water Algal Flora of Ceylon. A contribution to the study of Tropical Alg® and Algse of the inland Fresh-waters. *(Proc. Roy. Soc, London, B. Vol. Ixxix,pp.l97—254, with plates and map.)*

GAGE, A. T. — A case of lateral Floral Prolification of the inflorescence of the Pine-apple (Ananas sativus Schult. f.) *(Journ. Asiat. Soc, Bengal, Vol. Hi, 9, Nov. 1907, p. 593.)*

GAGNBPAIN, F. — Quelques Burmannia asiatiques nouveaux de PHerbier du Museum. *(Bull. Soc. Bot. France liv, pp. 459—465, Juin 1907.)*

GAMBLE, J. S. — Guttapercha trees of the Malay Peninsula. *(Kew Bull. 1907: pp. 109—121.)*

GAMMIE, G. A. — The Indian Cottons. *(Memo. Dept. Agri. India Bot. ser. ii' 2m 23, pp. 14, col. pi.)*

GAMMIE, G. A. — The orchids of the Bombay Presidency. *(Journ. Bomb. Nat. His. Soc, xviii, 1, Novr. 1907, pp. 88—91, with plates, and also 'part iv, Journ. Bom. Nat. His. Soc, xvii, 4, pp. 940—942, with plate, 1907.)*

GOBIS, A. ET "WALLABT, J. — Grains et huile de Chaulmoogra. *(Bull. Sc. Pharm. t. xiv, n. 203, 1907.)*

QBA?, O. B. — The India Tulsi Plant (Ocymum sanctum). *(Pharm. Journ. Ixxix, 1947, pp. 506—507, 1907.)*

HEINIG, R. L. — Flora of Chittagong.

HEMSLEY, W. B. AND WATSON, W. — Saxifraga Brunoniana. *(Curtis Bot. Mag. 1908, 4, ser. 4, Nr. 40.)*

HILL, M. — Note on the introduction and acclimatization of the Mahogany *(Swietenia, Mahogani)* in India. *(Indian Forester, xxxiii, 7, pp. 308—312, 1907.)*

HOLTEBMANN, K. — Der Einfluss des Klimas auf den Bau der Pflanzengewebe. Anatomisch-physiologische TJntersu<-hungen in den Tropen. *(Leipzig, W. Engelmann. 244, p. 6, P'egetationsbilder und 16 lithographische Tafeln ML 12, 1907.)*

HOOPEB, D. — Helianthus annuus. The sunflower. *(Agri. Ledger 1907, 1, pp. 1—11.)*

HOOPEB, D. — Tamarindus indica. The uses and composition of Tamarind seeds. *(Agri. Ledger 1907, 2,pp. 13—16.)*

HOOPBB, D. — The fats of Garcinia species. *(Journ. and Proc, Asiat. Soc-, Bengal Hi, 5, pp. 257—259.)*

HOOPBB, D. — The seeds and oil of the Mexican Poppy, Argemone mexicana. *(Agri. Ledger, 1907, No. 5, pp. 35—39.)*

HOOPBB, D. — The oil of Lawsonia alba. *(Journ. and Proc. Asiat. Soc, Bengal, III, 1908, p. 35.)*

HOOPEB, D. — The fats of India Nutmegs. *(The Agri. Ledger No. 3 of 1907, p. 17.)*

HOOPEB, D. — Amphicome Emodi. *(Pharmaceutical Journal, Vol. 79, p. 506.)*

JOWITT, J. P. . Note on Apluda varia, Hack. *(Ann. Roy. Bot. Gard., Perz* deniya, iv,2, pp. 85—88, 1907.)*

KARSTEN, G. . Das indische Phytoplankton. *(Wiss. Erge6n. d> dentsch. Tiefsee Exp. a. d. Dampfer Valdhia, 1898-1899, Rrsg. v. C. chum. Bd. ii Tl. 2, Lfrg. 3, pp. 223—345, 20 Taf, 566. Jena, G. Fischer, 1907.)*

KING, SIE GEORGE, AND GAMBLE, J. S. Materials for a Flora of the Malayan Peninsula, Nos. 19 and 20. *(Journ. and Proc. Asiat. Soc, Bengal, Ixxiv, pt. 2, pp.* 383—*728, 1908.)*

KIRTIKAK, K. R. » A note on an edible Fungus from Lahore. *(Journ. Bomh* Nat. Ris. Soc. xvii, 4, pp. 1030—1031, 1907.)*

KOHCZYNSKI, A., AND MAKCHBEWSKI, L. Studies on the colouring matters of Datisa cannabina roots* *(Bull. Acad. Soc. Cracowie, II, 1907, p. 124.)*

VLEAKE, H. M. . Studies in the Experimental Breeding of the Indian Cottons—an introductory note. *(Jour?i. and Proc. Asiat. Soc, Bengal, iv, 1, Jany. 1908, p. 13.)*

^USHINGTON, A. W. . Note on some sucker-produced forests of the Krishna District Madras. *(Indian Forester, xxxiii, 10, pp. 445—451, 1907.)*

MANN, H. H. AND HUTCHINSON, C. M. Cephaleuros virescens Kunze, the red rust of tea. *(Memo. Lept. Agri. India, Bot. Series, 1, 6, p. 35, with plates, 1907.)*

OMASSEE, G. . Fungi Exotici. vi. *(Kew Bull. 1907, ffio. 4, pp. 121—124.)*

PEEKINS, J. . StyracacesB. *(Das Pflanzenreich, herausg. von A. Engler Reft • 30, (iv, 241.) Verlag von With. Engelmann, Leipzig. Freis ML 5, 60, 1907.)*

^ HITC, T. . Revisions of Ceylon fungi. *(Ann. Roy. Bot. Gard. Peradeniya, iv., 2, pp. XI—68, 1907.)*

PETOH, T. • A stem disease of tea *(Massaria theicola Fetch). (Circulars and Agri. Journ. Roy. Gard. Ceylon, Vol. iv, 4, July 1907, pp. 21—30.)*

PFITZER, E. UND KRANZLIN, F. Orchidacese-Monandrae-Ccelogynmae. *(Das Pflanzenreich. Reft 32, p. 169, with plates, 1907.)*

PRAIN, D. • Diospyros Kaki, Linn. f. and Meconopsis *(Enmeconopsis)* bella, Prain. *(Curtis's Bot. Magazine 4th ser, Hi, 28, April 1907.)*

PRAIN, D. . Codonopsis convolvulacea. *(Bot. Magazine iv, 38, Fe6ruary 1908.)*

BADLKOFER, L. . Sapindaceae novae indicso et malaicse ex herbario calcuttensi. *(Rec. Bot. Surv. Ind. Hi, pt. 3, 1907.)*

BAM, D. . Notes on the flowering, seeding, and cutting of Strobilanthes in Jaunsar Division in 1906. *(Indian Forester xxxiii, 10, pp. 451—452, 1907.)*

SCHULZ, O. E. • Erythroxylacese. *(Das Pflanzenreich, heransg. V. A. Engler, iv, 134, Leipzig, Engelmann. Preis MJc. 8, 80, 1907.)*

SYDOW, H. ET P. ET BUTLER. E. J. Fungi Indiae orientalis. Pars ii. *(Annalis. Mycologici v, 1907, PP- 485—515, with plates.)*

A TURNER, T. E. C. . Note on Terminalia Chebula and its fruit the Myrabolam of commerce. *(Indian Forester, xxxiii, pp. 362—365,1907.)*

^ "WATT, SIR G. . Handbook of Commercial Products of India.

^WILLIS, J. C. . The geographical distribution of the Dilleniacese, as illustrating the treatment of this subject on the theory of mutation. *(Ann. Roy. Bot. Gard. Peradeniya iv, 2, pp. 69—77, 1907.)*

X YATES, R. ABBEY . Account of an enquiry "with regard to the Candle-nut tree (Aleurites molluccana) in India. *(Agri. Ledger, No. 4, 1907, p. 25.)*

CALCUTTA : PRINTED BY SUPDT. GOVT. PRINTING, INDIA, 8, HASTINGS STREET.

Report of the Director of the Botanical Survey of India for the year 1908-09.

1. Eastern India,—BENGAL.—As there no longer exists any pressing necessity for exploring the plains of Bengal for the flora of which a handbook exists in Colonel Prain's " Bengal Plants ", attention has been concentrated on the vegetation of the hills of the Province mm* especially of the Sikkim Himalaya. Mr. W. W. Smith, M.A., the Curator of the Calcutta Herbarium, who has been directed to devote special attention to the Himalayan flora, has collected largely in the outer and lower hills, and his work in this region has been supplemented by collections made under the supervision of Mr. E. Pant-Jui?, th'3 Assistant Superintendent of the Cinchona Plantation and by collections made by Mr. G. E. Shaw, B.Sc, F.C.S., the Government Quiuologist.

EASTERN BENGAL AND ASS^M.—In As<am collections were made in the hills of the North Cachar district by Mr. W. G. Craib, MA , Officiating Curator °j the Herbarium, to supplement the collections made by the writer in the plains of the South Cachar district several years ago. Mr. A. Meebold, a gentleman to whom the Survey has already been much indebted also collected largely on behilf of the Survey on the eastern side of Assam mostly in the Mate of Manipur.

BURMA.—In Burma collecting work was restricted mostly *to* bringing together a living collection of the orchids of that province, In addition the Forest Department contributed a smill but interesting general collection.

2. Western India.—The Presidency of Bombay has now been added *° the as yet short list of the Provinces for which local floras have been finished, the last part of Dr. T. Cookes " Flora of the Presidency of Bombay " having appeared in December 1908 The Economic Botanist to the Government of Bombay has furnishad an account of what systematic work has been doue by his Department during the year from which it appears that different ^embers of his staff toured through the districts of Poona, Thana, Belgaum, Ranara and Sindh and collected a number of interesting specimens. The Herbarium collection was increased by 3,585 sheets while 4,504 sheets were distributed. Additions to our knowledge of the vegetation of the Presidency have been made by various gentlemen. Mr. G. A. Gammie, F.L.S., continues ^hat is practically a monograph of the Orchids of the Bombay Presidency, while the Rev. Father E. Blatter, S. J., is doing excellent service to the science by his work on the Ferns of the Bombay Presidency, on the Flora of Cutch and by his Statistieo-Biological studies of the general flora of the Presidency.

3. Southern India.—The official work done on behalf of the Survey does not bulk largely in the present report. Dr. Barber's Assistant was on tour 45 days during the year and accompanied the Acting Government Botanist to the Anamalais where he made a few collections. About 2,500 sheets were added to the Herbarium which was kept in good condition during the year,

Mr. A. Meebold, in addition to his Assam material presented to the Calcutta Herbarium a set of his collections which he had gathered while touring in Southern India, mostly in Mysore. The Rev. Father Blatter, S.J., has added to our knowledge of the vegetation of the Peninsula by working up and publishing the collections made in the Ooimbatore district by Mr. C. E. O. I'ischer of the Forest Department.

Mr T, F. Bourdillon/F.L.S., Conservator of Forests, Travancore, has made however the most important contribution in his " Forest Trees of Travancore " which should prove a most useful handbook to the Forest Flora of that State.

4. North-West India.—No official work whatever has been done on behalf of the Botanical Survey. The " Flora of the Upper Gangetic Plain " by Mr. J. F. Duthie, B A., F.US., formerly Director of the Botanical Department of Northern India has advanced a stage further, descriptions of species up to

the natural order *Scrophularineas* being now in the Press. The Flora of the Punjab and North-West Frontier Provinces is still in the hands of Mr. J. U. Drummond, I.O.S., (retired)f but I am unaware of what progress has been made with it. Meanwhile in default of a regular flora the descriptive key to# the Flora of the Punjab, North-West Frontier Province and Kashmir by Lieut-Colonel C. J, Bamber, I.M.S., in course of publication should prove most useful. Mr. I. H. Burkill, M.A., F.L.S., in his working List of the Flowering Plants of Baluchistan has brought together in compact form the scattered results of previous collections as well as much new information regarding the Flora of **that** region gathered by the staff employed on the Gazetteers of Baluchistan.

5. Publications.—Volume **III** of the Records of the Botanical Survey was brought to a conclusion during the year by the issue of title page and index. Since last report publication of the two long delayed volumes of the Annals of the Royal Botanic Garden has been accomplished. The first winch forms the second and concluding part of Volume VI is an account o£ a collection made by Mr. I. H. Burkill, of Fresh Water Algae from Burma and is written by W. West, F.L.S,, and Professor G. 8. West, M.A., F.L.S. The authors mention or describe 276 species of which 35 are new to science, while two new genera are described. Seven beautifully executed plates accompany the paper to which is appended a very full bibliograpy. The other Volume No, XI of the Annals is a sumptuous monograph of the Asiatic olimbing palms of the genus *Calamus* by Signor 0. Beccari, the distinguished Italian Botanist and traveller. There are over 500 pages of descriptive matter comprising in addition to a learned introductory essay on the morphology and distribution of the genus detailed descriptions of over 200 species of which over 20 are new. The monograph is illustrated with 230 ma^nificient double plates and as a whole constitutes one of the finest contributions to botanical science that have ever appeared in this or in any other country. The " Materials for a Flora of the Malayan Peninsula" initiated by the late Sir George King, K.C.I. E., formerly Director of the Botanical Survey of India, are being continued by Mr. J. Sykes Gamble, C.I.E, F.R.S., formerly of the Imperial Forest Department, and during the year part 21 comprising descriptions of the natural order *Gesneracece* and *Verbenaceoe* was published.

A list of publications on the Botany of India that have appeared during the year is appended to this Report.

6. Staff.—Captain A. T. Gage, I.M.S., was absent on combined leave from the beginning of the financial year until 14th December 1908 during which period Mr. W. W. Smith, M.A., Curator of the Herbarium, Royal Botanic Garden, Calcutta, officiated.

A. T. GAGE, ***Captain, I.M.S.,***

Director of the Botanical Survey of India.

A list 0/papers on the Botany of India published during 1908-09.

BAMBER, C. J. . Plants of the Punjab. *{Journ. Bom. Nat. Bis. Soc. xviii, 4, 835—861, 1908 and xix,* i, *59—86, 1909.)*

BARBER, C. A. . Studies in root-parasitism,. The haustorium of Cansjera Rheedii. *{Mem. Dept. Jgrù Ind. Bot. Ser. ii, 5, 37, with plates, 1908.)*

BECKER, *W.* . Ein Beitrage zur Veilchenflora Asiens *(Beih. Bot. Cbl. xx, AbU 2, 125—127, 1906.)*

BERNARD, CH. . Sur une anomalie des fruits de Carica Papaya. *Ann. du Jard. Bot. de Buitenzorg. Ser. 2, vii, 56—68, with plates, 1908.)*

BLATTER, E. . Fern6 of the Bombay Presidency. *{Journ. Bom. Nat. His. Soc. xviii, 3, 599—612, 1908.)*

BLATTER, E. . The Flora of the Bombay Presidency. (Statistico-Biological Notes.) *(Journ. Bom. Nat. His* Soc. xviii, 3, 562—571, 1908.)*

BLATTER, E. . On the Flora of Cutch. *(Journ. Bom. Nat. His. Soc. xviii, 4, pp. 756—777, 1908, and xix,* i, *157—176, 1909.)*

BONATI, G. . Scrofularinees nouvelles de l'Indo-Chine. *(Bull. Soc, Bot. France, Iv, 509 et 537, 1908.)*

BOSE, J. C. . Comparative Electro-Physiology. *(London, 1907.)*

BOUHDILLON, T. F. . The Forest Trees of Travancore. *(Travancore Govt. Press, 1908.)*

BURKILL, I. H., & FINLOW, R.S. The races of Jute. *(Agric. Ledger 1907-08, 6, 41—137.)*

BIJRKILL, I. H. . A working list of the Flowering Plants of Baluchistan. *(Calcutta, 1909.)*

COMPTON, R. H. . The Morphology and Anatomy of *Utricularia brachiata* Oliver. *(New Philologist, viti, 4, 117—130.)*

COOKB, T. & STAFF, O. » *Andropogon (Dichanthium* ?) *serrafalcoides* Cooke staff. *(Kew. Bull. 10, 1908, 450.)*

COOKE, T. , Flora of the Bombay Presidency, ii, pt. 5, with Index, *Jraceae* to *Gramineae*

COSTERTTS, J. C. . Pistillody of the stamens in Nicotiana. *(Bee. Trav. Bot. Neerland, iv, 221, with plate.)*

DANGUY, P. . Note sur une collection botanique rapportée du Pamir par le commandant de Lacoste. *(Journ. Bot. xxi, 3, 49—53, 1908.)*

DIXON, H. N. . Mosses from the Western Ghats* *(Journ. of Bot. xlvii, b57, May 1909, 157—164.)*

DODE, L. A. . Revue des espèces du continent asiatique de la section *Tetradium* et de la section nouvelle *Evodioceras* du genre *Evodia. (Bull. Soc. Bot. France. 1908, Iv, 9, 701—707, 1909.)*

DOP, P. . Contribution à l'élude des Malpighiacees d'Indo-Chine. *(Bull. Soc. Bot. France. Iv, 427—430, 1908.)*

FINET ET GAGNEPAIN . Additions à la flore de TAsie Orientale. *(Bull. Soc. Bot. France, liv, 82-90, with plates, 1908.)*

GAONEPAIN, F_3 . Bixacees et Pittosporacees asiatiques. *(Bull. Soc. Bot. France. Iv, 544, 1903.)*

GAGNEPAIN, P. . Contribution á la connaissance dea Xanthophyllutn. *(Journ. de Bot. xxi, 10, 241-253, 1908.)*

GA«NBPAIV, F. . Essai de classification des Scolopia et Flacourtia asiatiques. *{Journ. de Bot. xxi, 7, 164—173, 1908.)*

GAGNEPAIN, F. • Nouveautés asiatiqaea de Th^rbier du Muséum. (I. Hydrochaiitacees, II. Menispermacees, III. Lardizabalees.) *Bull. Soc. Bot. France. 1908, lv., 34r41, et 43-48.)*

. GAGNEPAIN, F. , Un arbre oleifere d^Indo-Chine. L'huile de Chaulmoogra et le faux Chaulmoogra. *{Journ. de Bot. xxi.,6,187-144, J903.)*

'GAMBLE, J. S. . Materials for a Flora of the Malayan Peninsula pt. 211 Verbenace®. 1908. •

GAMBLE, J. S. . *Acer Osmastoni* Gamble. *{Keio Bull. 10, 1908, 446.)*

GAMBLE, J. S. . *BotcKia Mansoni* Gamble. *(Kew Bull. 10, 1908, 445.)*

GAMBLE, J. S. . *Cynometra Bourdilloni* Gamble. *{Kew Bull. 10, 1908, 446.)*

GAMBLE, J. S. . *Wrightia Sikkimmcmis* Gamble. *(Kew Bull, 10, 1908, 447.)*

. GAMMIE, G. A. . Indigenous trees and shrubs under observation. *(Report of Exp. Work, Ganeshkhind Bot. Stat.* 4—15,*1908.)*

GAMMIE, G. A. . The Orchids of the Bombay Presidency, pts. VI—VIII *(Journ. Bom. Nat. Hist. Soc. xviii., 3., 586-590, 1908, 4 833-834,1908; xix, /., 1909, 139—141.)*

GBKRMANN, K. . Vorarbeiten zu einer Monographic der Gattung *Brideha (Engler's Bot. Jahrb. xli., Beibl. 95, 1—42, 1908 with plates.)*

(GUBGUEN, F. . Enations hypophylles du *Colocasia esculenla* Schott. *(Bull. Soc Bot. France. Iv. 26-32, with plates, 1908.)*

HERTER, W. . *Lycopodium sikkimense* Hert. *(Bot. Jahrbuch Band xliii^ 23 Feb. 1909, 42.)*

^ HILLIER, J. M. . Lalang grass *(Imperata arundinacca* Cyrill.) *(Kew Bull. 1909, 2, 55—59.)*

> HOOKER, J. D. • On some species of Impatiens. *(Hooker's Icones Plantarum , ix., 3, 2851—2875, 1908.)*

HOOKER, J. D. . On some species of Impatiens from Indo-China and the Malayan Peninsula. *(Kew Bull. L, 1909.)*

HUTCHINSON, J. . Notes on the Indian species of *Sambucus. (Kew BulL 4, 1909, 191—193.)*

T. KUSANO, S. . Further studies on Aginetia indica. *(Bull. Coll. Agric. Tokyo viii., /,* 59—78, *with plates, 1908.)*

LECOMTE, H. . Sabiacees asiatiques nouvelles del'herbier du Muséum. *(Bull* . Soc. Bot. France. 1907, liv., 671—678.)*

LINBBATJR, K. . Ueber Reizleitungsgeschwindigkeit und Latenzzeit bei *Mimosa pudica. (fViesner-Festsch. Wein, 1908, 396, with plates.)*

LIJSHINGTON, A. W. * Some notes on palms. *(Indian Forester, xxxv. March 1909, 148—153.)*

MARTEN, J. . List of Feres found at and around Mussoorie 1908. *(Journ. B*m. Nat. His. Soc. xix., I, 1909, 179—183.)*

X/WSTERS, M. T. . . . On the distribution of the species of Conifers in China and on the occurrence of the same species in neighbouring countries. *(Journ. Linn. Soc. London, xxxviii., 198—805, 1908.)*

NESTLER, A. . . > Die hautriezende Wirkung der *Primula mollis* Hook, und *Pr. Arendsii* Pax. *{Ber. deutsch Bot. Ges. xxvia. 468-475, 1908.)*

^PBTITMENGIN, M. . . . Revue critique des Prinaulacees asiatiques# *(Bull. Acad Intern. Geogr. Bot. xvii., Nos. 225—226, 334—338, 1908.)*

PRAIN, D. . . . . A new species of *Butea,* with notes on the genus. *(Kew Bull. 1908, 9, 381—387.)*

PBAIN, D., & BURKILL, I. H. . Dioscorearum novarum descriptiones qu&dam. *(Journ. and Proc. JsiaL Soc. Bengal, iv, 9, 447—457, Septr. 1908.)*

RENNER, O. . . . Beitr'age zur Anatomie und Systematik der Artocarpeen und Conocephaleen inbesondere der Gattung Ficus. *(Diss. Mu"ncheu 1906, 129.)*

SPRAGUE, T. A. . . . The prickly-fruited species of *Euonymus (Kew Bull. I, 29—36, 1908.)*

STAFF, Q. . . . . *Arthraxon, Meeboldii Sba,pi.(Kew Bull. 10, 1908, 449.)*

STAFF, O. . . . . *Mussanda Treulleri* Stapf. *(Kew Bull. 10, 1908, 449.)*

STAFF, O. . . . . *Pyru* Pashia* var. *Kumaoni* Stapf. *(Curt. Bot Mag. 53, May 1909.)*

WILLIAMS, F. N. . . . The CaryophyUaceaB of Tibet. *(Journ. Linn. Soc. xxxviii, 268, leb. 1909, 395-407.)*

WITT, D. O. . . . Forest Flora of the Berar Circle. *(Central Provinces Secre* lariat Press, 1909.)*

WRIGHT, C. H. . . . *Atyinia brae teat a* Roxb. *(Curt. Bot. Mag. 50, Feb.2909.)j*

S. G. P. I.—Xo. 1 D. B. S. I.—27-7-1909.—50.—C. L. M.

Report of the Director of the Botanical Survey of India for the year 1909-1910.

1. Eastern India.—BENGAL.—During July and August 1909 Mr. W. W. Smith, M.A., Curator of the Herbarium, and Mr. G. H. Cave, Curator of the Lloyd Botanic Gardens, Darjeeling, were deputed to thoroughly explore the little known north-west corner of Sikkim that comprises the valleys of the Zemu and Llonakh rivers with their tributaries. Messrs. Smith and Cave did theip work well and returned with some 6,000 specimens including about twenty species new to science. Mr. Smith has prepared a detailed account of the tojir and its botanical results, with descriptions of the new species, that will appear in the Records of the Botanical Survey as soon as the press can arrange for it. Collections from the outer hills were contributed by the late Mr. E. Pantling and by Mr. G. E. Shaw, B.Sc, F.C.S., both of the Cinchona; Department, and by Mr. E. E. Cooper.

EASTERN BENGAL AND ASSAM.—In this province work was necessarily restricted to the agency of native collectors. Trained Lepchas worked for part of the year in the Terai of the Jalpaiguri district.

BURMA.—Large accessions of material, that will prove very useful when the flora of Burma comes to be worked up, were received during the year. Mr. J. H. Lace, Chief Conservator of Forests, presented over 1,000 excellently preserved specimens that contained many species previously very inadequately represented in the Calcutta Herbarium. Important contributions that included species hitherto undescribed were also received from Captain E. W. MacGregor, I.M.S., Southern Shan States, and from the following Deputy Conservators, Mr. G. E. S. Cubitt of Bhamo, Mr. H. W. A. Watson of the Southern Shan States, Mr. A. Eodger of the Euby Mines, and Mr. E. M. Buchanan of Myitkyina. To all those officers the Botanical Survey is much indebted. From the Burma-Yunnan frontier a particularly fine collection of over 1,000 sheets was obtained from Mr. G. Forrest, well known for his botanical explorations in China.

2. Western India.—The most important contribution during the year to our knowledge of the vegetation of the Bombay Presidency has been furnished by Mr. W. A. Talbot, F.L.S., late Conservator of Forests, the first volume of whose illustrated *Flora of the Bombay Presidency* has appeared, including the orders from *Ranunculacece* to *Bosacece.*

Mr. G. A. Gammie, F.L.S., continues his account of the Orchids of the Bombay Presidency, his latest contribution being a description of the species of *Vanda* occurring in Western India. The Eeverend Father Blatter, S.J., has studied in detail the flora of Panchgani, a hill station on the Western Ghats near Mahableshwar. The moss flora of this side of India continues to be studied by Mr. L. J. Sedgwick, I.C.S.

Mr. W. Burns, B.Sc,, Economic Botanist to the Government of Bombay, has collected in the Dharwar and Broach Districts and has studied the plant life of certain limited areas in relation to environment. He has given attention to the genera *Mangifera* and *Tamarix* as they occur in the Presidency. His assistants toured through various districts and made collections chiefly of grasses. About 1,000 sheets were added to the local Herbarium.

3. Southern India.—For help in collecting and in enlarging our knowledge of South Indian plants, the Botanical Survey has been indebted during the year as heretofore to Mr. C. E. C. Fischer, Deputy Conservator of Forests, Coimbatore, through whose energy many gaps in the Calcutta Herbarium have been filled up.

4. North-West India.—From Nepal was received a collection of about 1,000 sheets made by Mr. I. H., Burkill, M.A., F.L.S., Eeporter on Economic Products, mostly from the district around Katmandu. From the Kumaon district a collection of about 600 specimens was made by native collectors under the supervision of Mr. N. Gill, F.L.S., Superintendent of the Government

Gardens there. Mr. A. R. Tucker, late of the Eevenue and Agriculture Department, presented over 300 specimens of plants from the neighbourly of Simla. Colonel C. J. Bamber, I.M.S., P.L.S., has continued his work on w plants of the Punjab, North-West Frontier Province and Kashmir. Mr. J. Duthie, B.A., P.L.S., has during the year finished his material for Volum ex of *The Flora of the Upper Gangetic Plain.* Mr. James Marten has te** attention to the plants in and about Mussoorie and has published a list ot tn with their times of flowering and other information.

5. Publications.—No official publication appeared during the year, a for lack of material but simply because the press has not been able to issue work on hand during the year. There are in the press the following ^^TTJ *Species of the Genus Dcemonorops* by Signor Beccari, which will form Volume or part of Volume XII of the *Annals of the Botanic Garden,* and will be a wor with about 100 double plates after the manner of the previous volume on species of the genus *Calamus,* referred to in last year's report; *Notes J'(ff, Journey to Nepal* by Mr. I.H. Burkill forming No. 4 of Volume IV ol w *Records of the Botanical Survey,* and embodying an account of the botani results of the author's tour to Nepal in 1907 ; *Catalogue of Ncn-herbaceow* ***Phanerogams cultivated in the Royal Botanic Garden, Calcutta, L*** *(numerical) 1st Fasciculus,* by the writer of this report, forming No. 1 of vo ume V of the Records, and furnishing an index to the first 4,000 plants the Garden; the complete material for Volume II of *The Flora of the* t/jgp. *Gangetic Plain* by Mr. J. F. Duthie. There are ready for the press *A i* ***anical Tour in the Zemn and Llonakh Valleys of Sikkim,*** **and** *Nova spec Indices* both by Mr. W. W. Smith, M.A., Curator of the Herbarium, the mer being a detailed account of the tour referred to in the first paragraph this report, the latter being descriptions of new species from various parts India; also 2nd Fasciculus of the Catalogue referred to already. A list ox lected publications bearing on the Botany of India is appended to this report.

A more detailed account of botanical work in India or concerned with I than is consistent with the scope of this report will be submitted later on connection with the Board of Scientific Advice.

6, Financial and Staff.-The Imperial and Provincial grants were in full. The Director was in charge of the department throughout the ye

A. T. GAGE, *M.B., Major, I.M.S.,*
Director, Botanical Survey of I

ADAMSON, R» S. — **. Note on the roots of *Terminalia Arjuna* Bedd.** *(New Phyto., 1910 ix, 150.)*

BAMBER, C. J. — **. Plants of the Punjab.** *[Journ. Bomb. Nat. Eis. Soc, 1909-10, xix, 370, 683, 943.)*

BLATTER, E. — **. The Flora of Panchgani.** *(Journ. Bomb. Nat. His. Soc, 1909, xix, 314.)*

BROWN, N. E. — **. *Mickolitzia obcordata* N. E. Brown.** *(Kew Bull, 1909, No. 9, 358.)*

BRÜHL, P. J. — **. Recent Plant Immigrants.** *(Journ. Asiat. Soc. Beng., iv, 2, 603.)*

BURKILL, I. H. — **. First Notes on *Cymbopogon Martini* Stapf.** *(Journ. Asiat. Soc. Beng., 1909, v, 89.)*

On Coptis. *{Journ. Asiat. Soc. Beng., 1909, v, 73.)*

CLARKE, C. B. — **. New Genera and Species of *Cyperacem.*** *(Kew Bull., Add. Ser. viii, 1908.)*

Illustrations of *Cyperacea.* *(Plates 144, London, 1909.)*

DUBARD, M. — . Les Sapotacées du groupe des Isonandrées. *(Rev. Gen. Bot., 1909, xxi, 392.)*

Sur les Isonandra des Indes orientales, *(Bull. Mus. Nat. Hist., Paris, 1909, 27.)*

DRUMMOND, J. R. — ***, Anaphalis deserta, Leontopodium fimbrilligerum, Leontopodium paradoxum, and Saussurea tangnensis. (Kew Bull., 1910, 76—78.)***

ENGLER, A. — , Die Bedeut. der Araceen für die Pflanzengeograph. Gleider. des tropischen und extratropischen Ostasiens. *(Sitzber. Kgl. preuss. Ah Wiss., Hi, 1909.)*

GAGNEPAIN, P. — ^Bixacées et Pittosporées asiatiques. *(Bull. Soc. Bot. France, 1908. Iv, 521, 544.)*

Essai de classification des *Scolopia* et *Flacourtia* aeiatiques, *(Journ. Bot., 1908, xxi, 164).*

^xEssai d'une classification des *Cratoxylon* asiatiques. *(Notul. System, 1909,14.)*

u/'Essai d^une classification des *Sida* asiatiques. *(Notul. System. 19O9> 37.)*

Nouveautés asiatiques de l'herbier du Museum. *(Bull. Soc. Bot. France, Ivi, 1909, 15, 35.)*

GAMMIE, G. A. — . Orchids of the Bombay Presidency, Part IX. *(Journ. Bomb. Nat, His. Soc, 1909, xix, 624, with 1 plate.)*

GEHRMANN, K. — . Die geograph. Verbreit. und Entwick. der Gattung *Bridelia.* *(Jahrber. Schlesesch. Ges. vaterl. Kultur, Ixxxvi, 1909, 28.)*

GOEBEL, K. — **. *Ilonoselenium tenerum* Griffith.** *(Fl. Allgem. Bot. Zeit., 1910, 45.)*

HAMET, R. — **. *Sedum Prainii, 8. Lenii, S. Xicia* sp. nov.** *(Bull. Soc. Bot. France, hi, 1909, 566.)*

HEMSLEY, W. B. — **. *Cornus macrophylla* and some Asiatic congeners.** *(Kew Bull., 1909, 8, 329.)*

HILL, A. W. — . The Genus Myxopyrum. *(Kew Bull., 1910, 40.)*

HOOKER, J. D. — . Les especes du genre "Impatiens" dans THerbier du Museum de Paris. *(N Arch. Mus. Hist. Nat., 1909, x, 2, 233, with plates.)*

JoWITT, J. F. — . Note on Dr. Otto Stapf s Nomenclature of *Cymbopogon Nardus* Rendl., and *G. cohfertiflorus* Stapf. *(Ann. Hoy. Bot. Gard. Peraden. 1908, iv, 185.)*

KRANTTER, L. — , A comparative study of the genus *Pentestemon. (Contr. Bot. Zab., Univ. of Philadelphia, 1908, Hi, 93.)*

KUSANO, S. — **Further studies on *Aeginetia indica.* *(Bull. Coll. Agric. Tokyo Imp. Univ. 1908, viii, I.)***

MARTEN, J. — . Plants gathered in and about Mussoorie during 1908. *{Journ. Bom. Nat. His. 8oc, 1909, xix, 475.)*

-PRAIN, D. — *Corydalis spathulata. (Kew Bull,, 1910, 73.)*

Rheum inopinatum Prain. *{Bot. Mag., 1908, Tab. 8190.)*

<; RADLKOFER, L. — Ueber die Gattung *Allophylus* und die Ordnung ihrer Arten. *(Sitzber. Math-pkys. Klasse Kgl. bayer Ah. Wiss., 1908, 20L))'*

^ ROLFE, R. A. — *Saccolabium (Calceolaria) platycalcaratum* Rolfe *{Kew BulL, 1909', 868.)*

tSCHWERIN, F. V. — Monographic der Gattung *Sambucus. (Mitteil. der Deuisch DendroloQ. Gesell, 1909, p. 1.)*

SEDGWICK; L. I, — A first List of Mosses from Western India. *{Journ. Bom. Nat. His. Soc, 1910, zix, 938.)*

SERVETTAZ, C. — Monographie des Eleagnacees. *{Beihefte Bot. Centralbl. 1909, xxv, pp. 1 8f 129.)*

/-SKAN, S. A. — *Scutellaria violacea* Heyne. *{Bot. Mag., 1910, Tab. 8320.)*

\SPRAGTJE, T. A. — *Chirita barbata* Sprague. *{Bot. Mag., 1908, Tab. 8200.)*

i TALBOT, W. A. — Forest Flora of the Bombay Presidency and Sind. *{Poona, 1909, pp. 508).*

r WOLF, T. — tJber die neue Monographie der Gattung Potentilla *{Isis, 1908, 52.)*

^WRIGHT, C. H. — *Peliosant/ies violacea* Wall VAR. *Clarkei. {Bot. Mag., 1909, Tab. 8276.)*

CALCUTTA : rSUNTZD DI BUPDT. OOVT. PRINTING, INDIA, 8, HASTINGS 8TBEBT,

Eeporfc of the Director of the Botanical Survey of India for the year 1910-11.

1. Eastern India.—The Director in his capacity as Superintendent of the Royal Botanic Garden, Calcutta, has continued his work of cataloguing the trees and shrubs cultivated therein. Up to 10,000 numbers have now been checked, leaving over 3,000 still to do. During the rainy season of 1910 Mr. W. W. Smith, Curator of the Herbarium, studied in the field the vegetation of the south-east corner of Sikkim in the same way as he had done the north-west corner of that state in the previous year. On this occasion his operations ranged along the Sikkim side of the Cho-La ridge that separates Sikkim from the Chumbi Valley and extended practically from Lingtu and Gyi-mo-chi to the Thanka-La. The weather conditions in contrast to what was experienced in the Llonakh uplands in the previous year were very bad, but in spite of this drawback Mr. Smith collected about 6,000 specimens and first-hand materials for an account of the vegetation of this area that will appear in the Records of the Botanical Survey in due course. The routes followed in 1909 and 1910 are shown in the map illustrating No. 5 of Volume IV of the Records which is just about to be issued. The collection from the Cho-La in addition to conducing to a more accurate knowledge of the vegetation generally of the area has yielded over a dozen species new to science. Towards the end of the year Mr. Burkill, Reporter on Economic Products, in the course of his tours undertaken in that capacity along the Nepal frontier also made collections and recorded observations on the vsgetation of the area traversed by him along the frontier trade route. Mr. EL H. Haines, Conservator of Forests, has during the year issued the fruits of his botanical observations and collections made in the course of his several years service in Chota-Nagpur in the shape of an excellent Forest Flora of that Division and of Gangpur and the Sonthal-Parganahs. This forms a valuable contribution to a systematic knowledge of the vegetation of Bengal.

Although the Botanical Survey as a Department was not able during the year to work direct in Burma it has largely benefited, as hitherto, by the practical interest in the vegetation of that province displayed by several officers of other departments of Government stationed there. Captain R. W. MacGregor of the Indian Medical Service has contributed from the Southern Shan States a very interesting collection of about 1,600 specimens amongst which are several novelties. Messrs. A. Rodger, G. S. Cubitt and H. W. A. Watson, all Deputy Conservators of Forests, have sent materials from various parts of Banna. The first about 400 specimens from the Ruby Mine District, the second over 200 specimens from the Bhamo Division and the third a collection from the neighbourhood of Taunggyi.

2. **Western India.**—Mr. Burns, Economic Botanist to the Bombay Government, has studied the types of vegetation occurring on the sea shore near Bassein and has published his observation. Mr. Burns has also presented the survey with a small but interesting collection of specimens from the Bombay side. He and his assistants have also collected in Kanara, Poona, Thana, Kolaba, Dharwar, Belgaum, Sholapur and Satara, adding altogether over 800 sheets to the local Herbarium. The latter has been greatly enriched by the acquirement of the herbarium—numbering over 10,000 sheets—of Mr. Talbot, Conservator of Forests, retired. Mr. G. A. Gammie has published descriptions of the orchids of the genera Saccolabium, Sarcanthus, Cleisostoma, Pogonia, Spiranthes, Zeuxine and Cheirostylis that occur in the Bombay Presidency. Mr. L. J. Sedgwick has continued his studies of the mosses of Western India and has published a second list of species found on that side.

3. **Southern India.**—The most important contribution from this area was made by Mr. Alfred Meebold who on his own account made an extensive tour in the latter end of 1910 through the States of Cochin and Travancore. Mr. Meebold has enriched the collections at the Calcutta Botanic Garden by over 2,000 sheets—amongst them rare plants and new species—from the above mentioned states. Mr. C. E. C. Fischer, Deputy Conservator of Forests, has, as

before, contributed largely, over 1,600 specimens having been received from him during the year. *Dr. C. A. Barber, Madras Government Botanist, presented over 800 sheets. During the year Dr. Barber had made a study of the natural order *Loranthacea* while on leave.

4. **North-West India-**—Several more parts of Colbnel J. C. Bamber s descriptive key to the Flora of the Punjab, North-West Frontier Province and Kashmir, have been issued during the year. Collections were made in the United Provinces' Himalayas by Indian collectors working—as during last year —under the care of Mr. N. Gill of the Kumaon Government garden. Lieutenant S. M. Toppin, R.G.A., has contributed a small collection of Malakand specimens collected by himself.

5. **Publications.**—Of the publications referred to in last year's Report as being in the press, Signor Beccari's large work on the species of the genus *Dcemonorops* is about to issue, while Mr. Bur kill's *JNotes from a Journey to Nepal* and the first fasciculus of the writer's *Catalogue of the non-herbaceous Phanerogams cultivated in the Royal Botanic Garden, Calcutta,* forming respectively No. 4 of Volume IV and No. 1 of Volume V of the Records of the Botanical Survey have been published. Mr. Smith's account of his tour in the Zemu and LIonakh valleys of Sikkiin and descriptions of new species and the writer's second fasciculus of the Garden Catalogue just referred to are about to issue as No. 5 of Volume IV and No. 2 of Volume V respectively. The account of the determinations of prickly pears now wild in India by Mr. I. H. Burkill **is now ïn f.ypo *a*<* No fi of Volume IV of the Records, while a third fasciculus** of the Garden cataJogue is ready for the press. Both Messrs. Burkill and Smith have published several other papers *on* botanical subjects in non-official periodicals. These are mentioned in the list of published papers appended to this report. The second volume of Mr. Duthie's Flora of the Upper Gangetic Plain including descriptions of species in the natural orders from *Pluinbaginacetz* to *JPlantaginece* has been issued. Mr. R. J. D. Graham, Economic Botanist, Central Provinces, has published a *List of wild plants found on the Nag put and Telin kheri Farms.*

6. **Finance and Staff.**—From 1st of April 1910 the provincial grants from the Governments of Bengal, Eastern Bengal and Assam, and Burma were discontinued and the Survey was placed on a more satisfactory footing. Two Indian assistants f o'- systematic work, a photographer and clerk were sanctioned while R5,000 were allotted for exploration, travelling allowances and contingencies. Messrs. S. C. Banerji and M. S. Ramaswami were appointed assistants on probation for three years from 1st April 1910. Both have worked with commendable assiduity during the year and their help is much appreciated. The other members of the staff have also worked well. All the officers of the Survey were in charge of their respective posts throughout the year. The budget allotment for exploration and contingencies was spent in full; but there was a saving of RI,195 under travelling allowances. From January 1911 the Department of Economic Products was transferred to the Botanical Survey of India. The Report of the Officiating Reporter on Economic Products dealing with the work of his Department has been forwarded to Government separately so that no reference is made to it here. A considerable amount of systematic botanical work concerned with India has been done extra-departmentally and a considerable number of papers published in connection with such. The limits of this departmental report do not. permit of appropriate reference being made to such work here but a more detailed account of botanical work generally done in or with reference to India will be presented later on to the Board of Scientific Advice.

A. T. GAGE, ***Major, I.M.S.,***

Director, Botanical Survey of ***India.***

A list of papers containing references to the Botany of India published mostly during 1910-11.

BAMBER, C. J. . . Plants of the Punjab. Part VI. *{Journ. Bomb. Nat. Hist. Soc, xx, 1910-11, Ms. 2—4, p. 468 -502, 800-836, 1084—1102.)*

BEAUVERD, G. . . Contributions à 1'etu'le des Composées asiatiques. II—IV. *(Bull. Soc. Bot. Geneve, 1910, p. 36-51, 99-145, 207—253.)*

BENOIST, R. . . Espèce et locality nouvelles de *Barleria. (Notulce Systematic^ i, JVo. 12, p. 362.)*

BLATTER, E. J. . . The Palms of British India and Ceylon. II—IV. *(Journ. Bomb. Nat. Hist. Soc, xx, 1910-11, Nos. 2-4, p. 347—360, 675—705, 981—995 with 16 plates and 1 map.)*

BONATI, G. . . . Contribution à l'etude du genre *Pedicularis. (Bull. Soc. Bot. France, Ivii, 1910, Mem. 18.)*

BRUNNER, C. . . . Beiträge zu vergleichenden Anatomie der Tamaricaceen. *(Dissert. Erlangen, 1909, pp. 94.)*

BURKILL, I. H. . . Notes on the pollination of flowers in India. Note No. 7. A few observations made in the Central Provinces and Berar. *(Journ. Asiat. Soc. Beng., vi, 1910, No. 3, p. 101—107.)*

" " . . Notes from a journey to Nepal. *(Rec. Bot. Surv. Ind., iv, No. 4, 1910, p. 59 140, with map.)*

BURNS, W. . . . A *Tamarix* association. *(Journ. Bomb. Nat. Hist. Soc., xx, 1910 p. 198—200.)*

" " . . A study of sea-shore vegetation. *(Journ. Bomb. Nat. Hist. Soc, xx, 1911, p. 1024-1027.)*

CAMPBELL, D. H. . The Embryo-sac of *Pandanns. (Bull. Torr. Bot. Club, xxxvi, 1909, p. 205—220, with 2 plates.)*

CAMUS, A. . . Contribution a l'etude des especes asiatiques du genre *Juncus. (Notula Systematic^, i, 1910, No. 9, p. 274—283.)*

CANDOLLE, C. DB . Note sur la distribution geographique des especes du genre *Peperomia. (Bull. Geogr. Bot., xx, 1911, p. 3 —6.)*

CAVILLIER, P. . . Nouvelles études sur le genre *Doronicum. (Ann. Conservat. et Jard. Bot. Genève, 1909-10, p. 195—368 with 1 pi.)*

CRAIB, W. G. . . [Diagnoses of new species in] " Decades Kewenses." *(Kew Bull., 1910, p. 275—280, 382, and 1911, p. 189—191.)*

CRAIB, W. G. & HUTCHINSON, J. *Xylia Kerrii (Hookers Ic Plant., x, 1911, Pt. 2, tab. 2932.)*

CZAPEK, *F.* . . Beitrage zur Morphologie und Physiologie der epiphytisohen Orchideen Indiens. *(Sitzuttgsber* Kais. Alcad. Wiss. Wien, 1909, cxviii, p. 1555—1580.)*

DIELS, L. . . . *MenispermacecB. (Das Pflanzenreich, 1910, Heft 46, pp. 345.)*

DIXON, H. N. . . *Merceyopsis,* a new genus of Mosses, with further contributions to the Bryology of India. *(Journ. Bot., xlviii, 1910, No, 576\ p. 297—310 with 2 plates.)*

" . . *Hyophilopsis,* a new genus of *Pottiacea,* with further contributions to the Bryology of India. *(Journ. Bot., xlix, 1911, No. 581, p. 137—150, with 1 plate.)*

DOP, P. . . . Sur les *Strychnos* de *V* Asie0rientale. *(Cornpt. Mend. Acad. Sc, 1910, p. 1256—1275.)*

. . . Contribution à Tetude des Loganiacées asiatiques de Therbier du Museum de Paris. *(Bull. Soc. Bot. France, Ivii, 1910, Mem. 19, pp. 30.)*

DRUMMOND, J. R. . . *Agave lurida (Kew Bull. 1910, p. 344—349.)*

DUBARD, M. . . . Reoherches sur le genre *Palaquium. (Bull. Soc. Bot. France, Ivi, 1909, Mem. 16, pp. 24.)*

" . . Remarques sar la classification.des Sideroxylées. *(Compi. Bend. Acad. Sc Paris, clii, 1911, 7, p 390—393.)*

DUNN, S. T. . . *Adinobotrys* and *Padbruggea. (Kew Bull. 1911, p. 193—198.)*

DYKES, W. R. . . *Iris himalaica. (Gard. Chron., xlv, 1909, p. 36.)*

FEDDE, F. . . *Papaveracea-Hf/pecoidea* et *Papaveracea-Papaveroidea. (Das PJlanzenreich, 1910, Heft 40, pp. 430.)*

FEDTSCHENKO, O. . . *JEremurus.* Kritische Uebersicht der Gattung. *(Mem. Acad. Imp. Sc 8t. Petersbourg, xxiii, 1909, pp. 210, with 24 plates.)*

FIEDLER, H. . . . Beiträge zur Kenntnis der Nycta^iniaceen. *(Bel. Jahrbuch. xliv, 1910, No. 6, p. 572-605.)*

FINET, A. . *Bulbophyllumcylindraceum* Ldl. et *B. khaayanum* Griff. *(Notula Systematic^, i, 1910, No. 7, p. 193—194)*

FISCHER, C. E. C . Poisonous plants. *Semerarpus Anacardium* L. V4R. *cuneifolia- [hd. Forest, xxxvi, U)lO, p. 361—362)*

GAGE, A. T. . Catalogue of non-herbaceous Phanerogams cultivated in the Roja Botanic Garden, Calcutta. Part I. Numerical list As Fasciculus, *[Rec. Bot. Surv. Ind., v, No. 1,* JJ. *1—U&> map)*

GAGNEPAIN, F. . Sur la famille des Okcacées. *(Bull. Soe. Bot. France, l*» 1910, No. 5, p. 373-380)*

„ . Essai d'une classification des *Leea* asiatiques. *(Bull Soe. Bot* Prance, hii, 1910, No. 5, p. 331—336)*

„ • Malvacées et Sterculacie"es nouvelles de llndo-Chine. *(Notula, Systematic^ i, 1909, No. 3, p. 77—85)*

„ . Essai d'une classification du genre *Grewia. (Noiula Systematic^, i, 1909, Nos. 4—5, p. 119—132.)*

„ . Tiliacées nouvelles d'Asie. *(Notula Systematica, i} 1910, No. 5, p. 132—137.)*

„ , Essai de classification du genre *Tetrastigma. (Notula Systerna- iicce, i, 1910, Nos. 10-11, p. 306-326.)*

„ . Un genre meconnu : classification des *Cissus* et *Cavratia. [™°~ tula Systematic^, i, 1910, Nos. 11-12, p. 339—362)*

GAMBLE, J. S. . *OxytenanUera Lacei,* in " Docades Kewenses." *(Kew Bull*, 1910, p. 385 and 1911, p. 192)*

„ . New *Lauracea* from the Malayan region. II-IV. *(Kew Bull-* 1910, p. 218—228, 312- 321, 357—368)*

GAMillE, G. J\, . Orchids of the Bombay Presidency. XI. *(Journ. Bomb. Nat. Hist. Soe, xx, 1911, Jlo. 3, j?. 597—602.)*

7~ Oiis} A . , * *Recherches sur les Lythrsicies. (Zons-le*Saunter, 1909, p. 16v> with 3 plates.)*

/> GORIS, M. A. . Contribution a l'etude des Anacardiacees de la tribu des Mangi- ferees. *(Aun. Sc. Nat., Bot., xi, 1910, p. 1—29.)*

^GRIFFITHS, D. . Illustrateo studies in the genus *Opnntia. (Rept. Missouri Bot- Gard,, xxi, p. 165—174 with 10 plates)*

GUEIUN, P. . Recherches sur la structure anatomique de la fleur, du fruit, et en particulier de la graine des JDipterooarpees, *(Bull* Soe. Bot. France, Iviii, 1911, Nos. 1-3, p. 9—17,39—48, 82—W)*

. Cellules a mucilage chez les Urticees. *(Bull. Soe. Bot. France, Iviii, 19 iO, No. 5, p. 399—406)*

GUILLAUMIN, A . Revision des *Atalantia* asiatiques. *(Notula Systematic^, *> 1910, No. 6, p. 175—184)*

. Especes- ou locality nouvelles pour les Rutacees d' Extreme* Orient. *(Notula Systematic^, i, 1910, No. 7,p. 207-224)*

HAGSTRÖJI, O.. *u Potamogelones* novi. *(Repert* spec, nov., viii, 1910, p- I4o 148)*

/ HAINES, H. H. . A Forest Flora of Chota Nagpur including Gangpur and the Santal-Parganahs. *{Calcutta, 1910, pp. VII + 634 + jcxxvii)*

HAMET, R. . Note aur deux especes nouvelles de *Sedum* (Repert. spec, nov., viii, 1910, p. 263—266)*

< HARMS, H. . tTber die Verbreitung der Leguminosen-Gattung *Ma$ter.na- (Repert. spec, nov., ix, 1911, p 367—369)*

/ HATE, V. N. '. Two species of *Ckara* from the Bombay Island. *(Journ. Bomb- Nat. Hist. Soe., xix, 1909, No. 3, p. 762-763.)*

„ . A note on the structure of the giant creeper *Calyeopteris bunda. (Journ. Bomb, Nat. Hist. Soe, xx, 1911, * p. 837—840, with 1 plate)*

> HOCHREUTINER, B. P. G. , Sur un point de nomenclature relatif du genre *Ougeiuia. (Ann Conservat. et Jard. Bot., Geneve, 1909-10, p. 50—51)*

. Indian species of *lmpatiens. (Kew Bull., 1910, p. 291—300)*

HOOKER, J. D. . *Hookers' Icones Plantarum, x, Pt. 1, 1910, Tab. 2901*2925.* [Contains descriptions and figures of Indian and Indo-Chinese species of lmpatiens, mostly new.]

^ JAHKEL, P. . Ueber Anatomie und Microchemie der Bananenfrucht und ihrer Reifung-sers cneineugen. *(Diss. 1309, pp. 41)*

JoffIHOK, D. S. . Studies in the development of the *Piperacea (Journ. estp- Zob'L, ix, 191\), p. 715-749)*

KERR, A. F. G.. • Notes on the pollination of certain species of *Dendrobium.* *{Notes Bot. School Trin. Coll., Dublin, it, 1909, p. 31—37, with 1 plate.)*

KoEHNE, E. . . Was ist *Cor mis macropfiyllat (Mitt, deutsch. dendrol. Ges. xviti, 1909, p. 122- U5.)*

„ . . *Pruni* subgeneris *Padi* species novae. *(Repert spec. nov.,s ix*f *1910, p. 33—37.)*

„ . . Die Gliederunf? von *Prunu,* Sub-g^nus *Padus. (Ferh. bot. Fer. 1'iov. Brandenburg, vii.)*

KRAUSE, K. . . Neue Arasesn. *{Bot. Jahrbüch., xliv, 1910, Beib.* Aa. *101, p. 9—14* j

KUWADA . . . A cyfcological study of *Oriza saliva* L. *(Bot. Mag. Tokyo, xxiv, VilO,p 267—281, with 1 plate.)*

LECOMTE, H. . . Les Myristicacées d'Indo-Chine. *(Notulct Systematical i, 1909, i\o.4,p.98—10L)*

w . . Simaroubacees de Tlndo-Chine et *do* la Chine. *(Notula Systematical, i, 1909, No. 4, p. 101—105.)*

. . Decades plantarum novarum XXVI. *(Repert. spec, nov., ix, 1910, p. 19-21)*

LEVEILLE*, H. . Iconographie du genre *EpVobiwm II.* Epilobés d'Asie. *(1910, p. t)9—167 with 61 plates.)*

. . Recherches morphologiques, anatomiques et physiologiques sur le Neflier du Japon., *[Eimiobotryajapo7iica.] (Thhe pour le Doct. Sci. naL Paris. 1910.)*

LUGARESI, E.

LIJSHINGTON, A. W. . . The genus *Citrus. (Ind. Forest., xxxvi, 1910, p. 323—353.)*

MAYER, F. . . Systematise^—anatomische Untersuchung der *Pogostemonea. (iJiss. 1909, p. 88:)*

MEEBOLD, A. . . Die Vegetationsverhaltnisse von .Maisor. *(Jahrber. scklesisch-Ges. vat. Kult., Breslau, Ixxxvii, 1910, p. 35—46.)*

MICHE, H. . . Die sogenannten Eiweissdriisen an den BJattern von *Jrdisia crispa A.DC, (Ber. deutsch. bot. Ges., xxix, 9, p. 156—157.)*

MILLER, C. . . Beitrage zur vergleichenden Anatomie der Blatter der Gattung *Agave* und ihrer Verwertung fur die Unterscheidung der Arten. *(Bot. Zeit. 1, Ivvii, 1909, Jbt. 22, p. 93—139.)*

PELLEGRINJ F. . . Sur les genres *Aglaia, Amoora* et *Lansium (Notula Systematic^, i, 1910, Nos. 9—10, p. 284—290.)*

PETRAK, FR. . . Uber eine neue Art der Gattung *Cirsium* aus den nordlichen Indien. *(Repert. spec, nov., ix, 1911, p. 197—199.)*

PRATN, D. . . . *Acry7nia aiugiflora (Hook. 1c. Plant., x, 1911, Pt. 2, Tab. 2946.*

QUEVA, C. . . Observations anatomiques sur le *Trapa natans* L. *(Assoc. Frane. Av. 3c. Congrh de Lille, 1909, p. 512—517.)*

REXNE . . Die Lithocysten der Gattung *Ficus. (Beih. Bot* Centralb. 1, xxv, 1910, Abt. 21, p. 183—200.)*

ROTIIERT, W. . . Ueber die anatomischen Differenzen der Gattungen *Dracaena* und *Cordyline. (Bull. Depart, de VAgric. Ind. néerland., 1909, p. 15.)*

SclIELLENBERG, G. . Eeiträge zur vergleichenden Anatomic und zur Systematik der Connaraceen. *(Mitt. Bot. Mus. Univ. Zurich*, und Dissert. Zürich, 1910, pp. 158.)*

SEDGWICK, L. J. . . A second list of Mosses from "Western India. *(Joura. Bomb. Nat. Hist. Soc, xx, 1911, No. 4, p. 1043—1045.)*

SIMMTER, G. . . Monographic der Gattung *Saponaria. (Denkschr. Ak. Wien, 1910, pp. 77 with 2 plates.)*

SMITH, W. W. . . Plantarum Novarum in Herbario Horti Regii Calcuttensis Cognitarum Decas. *(Journ. Asiat. Soc. Beng., vii, 1911, No. 3, p. 69-75.)*

. . A new Gentian and two new Swerfcias from the East Himalaya. *(Journ. Asiat. Soc. Beng., vii, 1911, No. 3, p. 69—79 with 2 plates.)*

. . Note *on Stercvlia alata* Roxb. VAR. *irregularis*—a remarkable instance of leaf variation. *(Journ. Asiat. Soc. Beng. vii, 1911, No. 3, p. 85—86 with 1 plate.)*

SPRAGUK, T. A. . . *Gooringia litlledalei. (Hook. 1c. Plant., x, 1911, Pt. 2, Tab. 8944.)*

^ STADLMANN, J. . Ein Beitrag zuz Kenntnis der Gattung *Pedicularis* L. (*Jahrber. £.£. Staatsgym. im XTI1 Berg, in Wien, x, 1910, p.* 1—7.)

^ STAPF, O. *Iris Clarkei* Baker. *{Bot. Mag., cxxxvi, 1910, Tab. 8323.)*

>- STEPHENS, E. L. The development of the seed coat of *Carica Papaya* L. *i* Ann. *Bot., xxiv, 1910, p. 607—610.)*

N STIETELHAGBN, H. Systematische und pflanzengeographische Studien zur Kenntnis der Gattung *Scrophularia. {Bot. JahrbÜch., xl*iv, *1910, No. 4,p. 409—496).*

% T AH ABA, M. Ueber die Kernteilung bei *Morus. {Bot. Mag. Tokyo,* ***** *1910,p. 231—289 with 1 plate)*

A TUZSON, J. Vergleichenden Anatomie der Nympheen. *{Math. Naturw-Ber. Ungarn., xxiv, 1909, p. 381.)*

/^ WENT, F. A. F. C. Untersuchungen ueber Podostemaceen. *[Verhand. Akad. Wetens. Amsterdam, xvi, 1910, No. 1, pp-* S8 with *15 plates.)*

WEST, W. Descriptions of three new species of *Alga* associated with Indian Freshwater Polyzoa, *[Journ. Asiat. Soc. Beng., vii,* 1911, *No. 3, p. 83—84 with 1 plate.)*

A WETTSTEIN, R. V. Ueber Parthenokarpie bei *Liospijros KaJci. {Oest. Bot.* Zeit-schr., *Iviii, p. 457—462.)*

WILDEMAN, E. DE. Materiaux pour une e*tude botanico-agronomique du genre *Jfc%l {Ann. Jard. Bot. Buitenzorg, 3rd Suppl. 1910, p. 345—oV*-)*

v WILLIS, J. C. A revised catalogue of the flowering plants and ferns of Ceylon- *{Ann. Roy. Bot. Gard. Veradeniya, iv, p. 467—510.)*

ft WISNIBWSKI, P. Ueber Induktion von Lenticellenwachemngen bei *Ficus. Ahad. Wiss. KraJcau, Math. Nat. Kl., Serie B., 1910, o> p. 359—367, with 2 plates.)*

^ YOUNG, M. S. The morphology of the *Podocarpinece. {Bot. Gaz. v, 1910* p. 81—100 wich 3 plates.)*

». G. P. I.—No. 2 D. B. S. I.-R. S .W.

BOOK CARD

Indian Botanic Garden Library

BOTANICAL SURVEY OF INDIA

Call No.....Acc. No. B2342

Author.....fSIffl3.../...ff£.o.rgc.....

(Director's Reports, B.S.I)

Title...Report of Botanical exploration in the Provinces of

'Name of Bofrower/Code No.	Date of Issue	Date of Return

Name of Bonower/Code No.	Date of Issue	Date of Return