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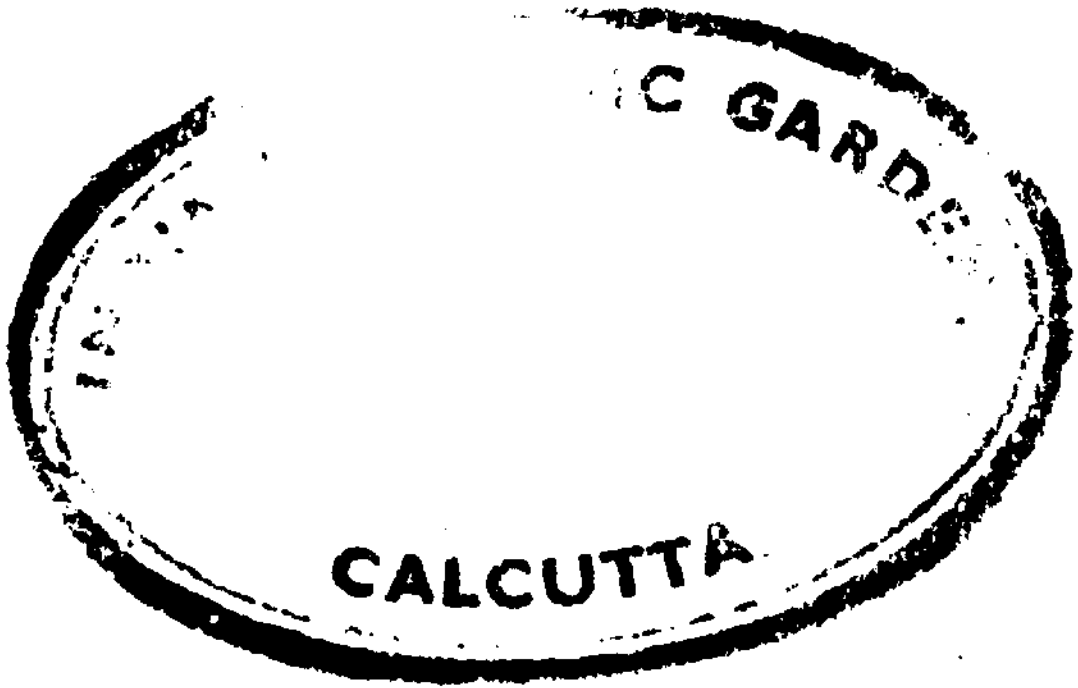
Royal Botanic Gardens, Calcutta

1922-23



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ANNUAL REPORT  
OF THE  
ROYAL BOTANIC GARDEN  
AND. THE GARDENS IN CALCUTTA  
AND OF THE  
LLOYD BOTANIC GARDEN, DARJEELING,  
FOR  
1922-23.

CALCUTTA :  
THE BENGAL SECRETARIAT BOOK DEPOT.  
1923.

[*Price, 2 annas.*]

[ Maximum limit, 4 pages.]

ANNUAL REPORT  
OF THE  
ROYAL BOTANIC GARDEN AND THE GARDENS IN CALCUTTA  
AND OF THE LLOYD BOTANIC GARDEN, DARJEELING,  
FOR 1922-23.

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ROYAL BOTANIC GARDEN.

**1. General.**—For botanical operations the season was favourable. The early rains in June prevented serious results from the prolonged period of drought experienced during the latter part of the hot weather. Rainfall during the year was in excess of the average, so that, with the garden lakes well filled towards the end of the rainy season, very little pumping was necessary throughout the dry cold weather months. A certain much needed relief to garden finances resulted in the shape of diminished pumping charges.

Works of a special nature in the garden include the erection of twenty-six new coolie huts, thirteen of which were completed within the year. For years past the condition of accommodation for the labour force has been far from satisfactory, the huts in use being old, dilapidated and ramshackle. No labour force could possibly be expected to remain healthy let alone contented in the conditions which existed and as, with retrenchment the most pressing need, help from sources other than garden funds proper could not be anticipated, the only course left was to divert part of the grant available for garden upkeep to this very necessary item of housing improvement. The scheme as planned could not be completed within the year, but will gradually be pushed on as funds permit.

On the western side a new gate has been opened near the Banyan tree, intended to give easy access to the garden to residents living in that quarter.

The Oreodoxa Avenue and the Orchid house were selected for special renovation and a new vista opened out with the intention of providing a view into the garden from the river side. Very little work could be done on the river bank, and nothing beyond trivial patching given to the roads. These are now in such a state of disrepair that a special grant will be necessary sooner or later to bring them into a condition in keeping with the rest of the garden. Fast and incessant motor traffic such as the roads were never built to carry is responsible for their wear. To set a limit of speed in the garden is just as difficult as it may be to do

so in Chowringhee, but the exclusion of motor traffic cannot now reasonably be suggested, and the only course left is to equip the roads to suit the changed conditions. It is hoped that means to recondition them will be available ere they get beyond repair.

The display of annuals though somewhat late was quite up to standard, as was also the Orchid house at the end of the cold and beginning of the hot weather.

2. **Plant and seed exchange.**—Over 55,000 plants were distributed, of which some 28,000 were trees for roadside and other planting. Nearly 9,000 shrubs and 2,600 palms were sent out to Government institutions, district boards and municipalities, the balance of the total distribution being made up of climbers, ferns and surplus annuals. Three hundred packets and 86 lbs. of seeds were distributed as was also the recurring supply of barrels of mahogany seed received from Kew. Over 5,000 plants were received by the garden, the bulk consisting of Gladiolus bulbs and orchids.

3. **Herbarium and Library.**—Work has been carried out along the usual lines, aid in the herbarium being given by Messrs. Debbarman and Narayanswami of the Botanical Survey of India Department. Over 5,000 specimens have been incorporated in the herbarium, the chief addition being duplicates of South Indian plants provided by Mr. C. E. C. Fischer of the Madras Forest Department.—His gift of these plants is the more welcome that it helps to replace a loss of South Indian plants incurred at sea during the war. Many of the herbarium cabinets are now getting overstocked and some re-arrangement and additional cabinet provision will become necessary in the near future. Sheets on loan for Scientific work to the number of 1,200 were sent out during the year, while about 3,000 specimens, mostly duplicates of Malayan species, were distributed to herbaria in Europe and elsewhere.

Work in progress in the herbarium includes the preparation by Lieutenant-Colonel A. T. Gage and Mr. Debbarman of a catalogue intended to provide information regarding the introduction, flowering and fruiting times and economic uses of the non-herbaceous phanerogams in the garden; also the preparation by the writer and Mr. Narayanswami of a catalogue of Indian plants not included in Hooker's Flora of British India. The more important collections dealt with include that made by Colonel Gage and Mr. P. T. Russel in the Tavoy cinchona area. A preliminary examination indicates the presence in this collection of several undescribed species, but examination at Kew with authentic material—especially recently acquired Siamese plants—is advisable before deciding on what is new to Science. Descriptions in English and drawings of "possibles" have, however, been prepared by Mr. Narayanswami to aid more critical examination when this can be done.

Library work has gone on as usual, 142 books, 53 periodicals and 234 irregular publications being received. As with other departments, the Library has had to stand its share of retrenchment.

4. **Publications.**—The distribution of Part II of Volume XII of the Annals of the Garden as well as of the appendix to Volume XI, which has long been in suspension on account of insufficiency of funds, is slowly going on as conditions allow. A fairly large consignment has recently gone out, and it is hoped to get the distribution completed in the course of the current year.

5. **Financial.**—Out of a total allotment of Rs. 73,880 for staff and permanent establishment, Rs. 66,244 were spent, the balance being savings

due to officers on leave. There were compulsory savings of Rs. 2,800 and Rs. 2,000 under "Temporary establishment" and "Contract contingencies"<sup>1</sup> respectively, and Rs. 5,484 reserved for purchase and freight on Europe stores remained unspent due to the non-arrival of these stores. Revenue being sale-proceeds of surplus plants and foreshore rent amounted to Rs. 5,01,7.

6. **Staff.**—Lieutenant-Colonel A. T. Gage, C.I.E., I.M.S., held charge as Superintendent till 2nd January 1923, when he went on leave preparatory to retirement. From this date till the end of the year the writer held charge. Mr. P. M. Debbarman officiated as Curator of the herbarium from the 1st April till the 26th June 1923 and again from the 3rd January 1923 till the end of the year. Between these periods the writer held charge of this, his substantive post.

Mr. G. T. Lane was Curator of the garden from 1st April till 6th May 1922, when he went on leave preparatory to retirement. With his retirement on the 2nd February 1923 Government loses an officer of long and faithful service. Mr. Lane first joined the garden staff some thirty-two years ago under the then Superintendent Sir George King, who early formed a high opinion of his character and abilities. Mr. Lane saw service under several Superintendents and acting Superintendents, and it is sufficient to say that all have left records endorsing the high opinion of him which Sir George King was first in a position to form. His relations with garden labour were particularly happy. Firmness combined with sympathy and tact were amongst Mr. Lane's natural gifts enabling him to command as loyal service from those placed in his charge as he himself never failed to give.

Mr. W. V. North was Assistant Curator from 1st April till 6th May 1922, thereafter Officiating Curator till Mr. Lane's retirement when he occupied the post substantively. Mr. S. N. Basu was Overseer from 1st April till 6th May 1922 and thereafter Officiating Assistant Curator. Mr. Merlin Jonea was Overseer and Babu Santosh Kumar Mitra head-clerk throughout the year. All officers and the clerical staff have performed their duties satisfactorily.

#### **CALCUTTA GARDENS.**

Work in these gardens was mostly of a routine nature but considerable additional expenditure over the normal was incurred by the renovation of the roads in Dalhousie Square. Some 30 unrepresented plants were planted out and about 200 new plants put into Dalhousie Square, while the widening of Dalhousie Square (West) necessitated the cutting out of several trees and shrubs. The annuals made quite a good show under the careful attention of Messrs. Mitra and Quasim Ali, the Assistant Curator and Overseer. Out of a total allotment of Rs. 46,502, Rs. 4,517 were saved mainly on salaries, house-rent and other allowances. The revenue, being fishing fee<sup>3</sup> from Dalhousie tank, amounted to Rs. 130.

#### **LLOYD BOTANIC GARDEN, UARJEELING.**

To do justice to the work so ably carried on by Mr. Cave in this model little garden would require a voluminous report in itself. Besides routine garden work, which in itself takes constant supervision, the Curator finds

time for many of the more technical problems associated with the Science of Horticulture and Botany. His work in the distribution of plants and seeds, especially, calls for commendation. The distributions during the year under review are the highest in the history of the garden. In spite of pressing financial difficulties the injury to the garden referred to in last year's report is gradually being made good and a special feature of the year was a successful attempt to arrest the subsidence of the south-west corner of the garden where the nurseries are situated. Out of a total allotment of Rs. 21,572 there was a small net saving of Rs. 420.

C. C. CALDBR,  
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ROYAL BOTANIC GARDEN.

**1. General.**—For botanical operations the season was favourable. The early rains in June prevented serious results from the prolonged period of drought experienced during the latter part of the hot weather. Rainfall during the year was in excess of the average, so that, with the garden lakes well filled towards the end of the rainy season, very little pumping was necessary throughout the dry cold weather months. A certain much needed relief to garden finances resulted in the shape of diminished pumping charges.

Works of a special nature in the garden include the erection of twenty-six new coolie huts, thirteen of which were completed within the year. For years past the condition of accommodation for the labour force has been far from satisfactory, the huts in use being old, dilapidated and ramshackle. No labour force could possibly be expected to remain healthy let alone contented in the conditions which existed and as, with retrenchment the most pressing need, help from sources other than garden funds proper could not be anticipated, the only course left was to divert part of the grant available for garden upkeep to this very necessary item of housing improvement. The scheme as planned could not be completed within the year, but will gradually be pushed on as funds permit.

On the western side a new gate has been opened near the Banyan tree, intended to give easy access to the garden to residents living in that quarter.

The Oreodoxa Avenue and the Orchid house were selected for special renovation and a new vista opened out with the intention of providing a view into the garden from the river side. Very little work could be done on the river bank, and nothing beyond trivial patching given to the roads. These are now in such a state of disrepair that a special grant will be necessary sooner or later to bring them into a condition in keeping with the rest of the garden. Fast and incessant motor traffic such as the roads were never built to carry is responsible for their wear. To set a limit of speed in the garden is just as difficult as it may be to do

so in Chowringhee, but the exclusion of motor traffic cannot now reasonably be suggested, and the only course left is to equip the roads to suit the changed conditions. It is hoped that means to recondition them will be available ere they get beyond repair.

The display of annuals though somewhat late was quite up to standard, as was also the Orchid house at the end of the cold and beginning of the hot weather.

2. **Plant and Seed exchange.**—Over 55,000 plants were distributed, of which some 28,000 were trees for roadside and other planting. Nearly 9,000 shrubs and 2,600 palms were sent out to Government institutions, district boards and municipalities, the balance of the total distribution being made up of climbers, ferns and surplus annuals. Three hundred packets and 86 lbs. of seeds were distributed as was also the recurring supply of barrels of mahogany seed received from Kew. Over 5,000 plants were received by the garden, the bulk consisting of *Gladiolus* bulbs and orchids.

3. **Herbarium and Library.**—Work has been carried out along the usual lines, aid in the herbarium being given by Messrs. Debbarman and Narayanswami of the Botanical Survey of India Department. Over 5,000 specimens have been incorporated in the herbarium, the chief addition being duplicates of South Indian plants provided by Mr. C. E. C. Fischer of the Madras Forest Department. His gift of these plants is the more welcome that it helps to replace a loss of South Indian plants incurred at sea during the war. Many of the herbarium cabinets are now getting overstocked and some re-arrangement and additional cabinet provision will become necessary in the near future. Sheets on loan for scientific work to the number of 1,200 were sent out during the year, while about 3,000 specimens, mostly duplicates of Malayan species, were distributed to herbaria in Europe and elsewhere.

Work in progress in the herbarium includes the preparation by Lieutenant-Colonel A. T. Gage and Mr. Debbarman of a catalogue intended to provide information regarding the introduction, flowering and fruiting times and economic uses of the non-herbaceous phanerogams in the garden; also the preparation by the writer and Mr. Narayanswami of a catalogue of Indian plants not included in Hooker's *Flora of British India*. The more important collections dealt with include that made by Colonel Gage and Mr. P. T. Russel in the Tavoy cinchona area. A preliminary examination indicates the presence in this collection of several undescribed species, but examination at Kew with authentic material—especially recently acquired Siamese plants—is advisable before deciding on what is new to Science. Descriptions in English and drawings of "possibles" have, however, been prepared by Mr. Narayanswami to aid more critical examination when this can be done.

Library work has gone on as usual, 142 books, 53 periodicals and 234 irregular publications being received. As with other departments, the Library has had to stand its share of retrenchment.

4. **Publications.**—The distribution of Part II of Volume XII of the *Annals of the Garden* as well as of the appendix to Volume XI, which has long been in suspension on account of insufficiency of funds, is slowly going on as conditions allow. A fairly large consignment has recently gone out, and it is hoped to get the distribution completed in the course of the current year.

5. **Financial.**—Out of a total allotment of Rs. 73,880 for staff and permanent establishment, Rs. 66,244 were spent, the balance being savings!

due to officers on leave. There were compulsory savings of Rs. 2,800 and Rs. 2,000 under "Temporary establishment" and "Contract contingencies" respectively, and Rs. 5,484 reserved for purchase and freight on Europe stores remained unspent due to the non-arrival of these stores. Revenue being sale-proceeds of surplus plants and foreshore rent amounted to Rs. 5,017.

6. **Staff.**—Lieutenant-Colonel A. T. Gage, C.I.E., I.M.S., held charge as Superintendent till 2nd January 1923, when he went on leave preparatory to retirement. From this date till the end of the year the writer held charge. Mr. P. M. Debbarman officiated as Curator of the herbarium from the 1st April till the 26th June 1923 and again from the 3rd January 1923 till the end of the year. Between these periods the writer held charge of this, his substantive post.

Mr. G. T. Lane was Curator of the garden from 1st April till 6th May 1922, when he went on leave preparatory to retirement. With his retirement on the 2nd February 1923 Government loses an officer of long and faithful service. Mr. Lane first joined the garden staff some thirty-two years ago under the then Superintendent Sir George King, who early formed a high opinion of his character and abilities. Mr. Lane saw service under several Superintendents and acting Superintendents, and it is sufficient to say that all have left records endorsing the high opinion of him which Sir George King was first in a position to form. His relations with garden labour were particularly happy. Firmness combined with sympathy and tact were amongst Mr. Lane's natural gifts enabling him to command as loyal service from those placed in his charge as he himself never failed to give.

Mr. W. V. North was Assistant Curator from 1st April till 6th May 1922, thereafter Officiating Curator till Mr. Lane's retirement when he occupied the post substantively. Mr. S. N. Baau was Overseer from 1st April till 6th May 1922 and thereafter Officiating Assistant Curator. Mr. Merlin Jonea was Overseer and Balm Santosh Kumar Mitra head-clerk throughout the year. All officers and the clerical staff have performed their duties satisfactorily.

#### **CALCUTTA GARDENS.**

Work in these gardens was mostly of a routine nature but considerable additional expenditure over the normal was incurred by the renovation of the roads in Dalhousie Square. Some 30 unrepresented plants were planted out and about 200 new plants put into Dalhousie Square, while the widening of Dalhousie Square (West) necessitated the cutting out of several trees and shrubs. The annuals made quite a good show under the careful attention of Messrs. Mitra and Quasim Ali, the Assistant Curator and Overseer. Out of a total allotment of Rs. 46,502, Rs. 4,517 were saved mainly on salaries, house-rent and other allowances. The revenue, being fishing fees from Dalhousie tank, amounted to Rs. 130.

#### **LLOYD BOTANIC GARDEN, DARJEELING.**

To do justice to the work ably carried on by Mr. Cave in this model little garden would require a voluminous report in itself. Besides routine garden work, which in itself takes constant supervision, the Curator finds

time for many of the more technical problems associated with the Science of Horticulture and Botany. His work in the distribution of plants and seeds, especially, calls for commendation. The distributions during the year under review are the highest in the history of the garden. In spite of pressing financial difficulties the injury to the garden referred to in last year's report is gradually being made good and a special feature of the year was a successful attempt to arrest the subsidence of the south-west corner of the garden where the nurseries are situated. Out of a total allotment of Rs. 21,572 there was a small net saving of Rs. 420.

C. C. CALDBR,  
*Offg. Superintendent,*  
*Royal Botanic Garden, Calcutta.*

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and of the Lloyd Botanic Garden  
Darjeeling

For  
1923-24

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**ANNUAL REPORT**  
OF THE  
**ROYAL BOTANIC GARDEN AND THE GARDENS IN CALCUTTA**  
**AND OF THE LLOYD BOTANIC GARDEN, DARJEELING,**  
**FOR 1923-24.**

—◆—  
**ROYAL BOTANIC GARDEN.**

**1. General.**—The year under review has not been altogether favourable from the horticulturist's standpoint. During the early part of the hot season, and again towards the end of the cold, there was an almost entire absence of rain in consequence of which the garden took on a parched appearance and a larger part of the labour force than is usually employed in caring for potted plants and beds in the open, had to be detailed to do watering work. This was the more unfortunate that labour itself was none too plentiful and that financial considerations dictated the strictest economy in its employ. The results of the prolonged periods of drought were not immediately apparent on trees and shrubs already well established, but a number subsequently dried and will require replacing.

The dry spell at the end of the year unfortunately gave opportunity for a form of damage that has become serious and much too frequent of recent years. Whether from visitor's thoughtlessly throwing away lighted matches or as a result of deliberate wickedness on the part of evil doers is difficult to say, but quite an abnormal number of fires have taken place of recent months. Some of them are difficult to account for on the assumption that accident was responsible.

Fires are not likely to break out spontaneously or accidentally on islands inaccessible to the visiting public, yet a large island in the King Lake suffered severely one night as a result of what must have been deliberate incendiarism. The object gained, whatever it may be, by this form of crime, must be satisfying for some malcontents but it is poor recompense for those who have laboured to make the garden a beauty spot for the crowds of visitors who now frequent it. A check kept at all the entrances to the gardens one day during the cold weather show a total of 1,540 visitors.

In spite of the discouragements above mentioned routine work directed to keep the garden in a fit and proper state went on throughout the year, and a certain amount of garden improvement was also found possible. This took the form of rearranging and restocking some of the plant houses. The Orchid house in particular having become dense and overgrown stood most in need of attention. The rearrangement brought about has added greatly to its attractiveness in rendering it lighter and opener and in



allowing the eye to take in the general effect at a glance. New beds and rockeries have been prepared while a number of desirable shade-loving species have been added to the collections. Similar work in certain of the remaining plant houses will be undertaken as opportunity and funds allow.

In last year's report mention was made of the very unsatisfactory condition of the garden roads. There being no special allotment available for the purpose it became imperative to divert part of the now reduced grant under contingencies to their renovation. They had reached a state when public disapprobation was justified and when indignation was already expressed in the form of side paths on the grass lawns running parallel with the main avenues. Although the funds could ill be spared from other urgent items of garden improvement, an amount sufficient to remake the whole length of the Banyan and to patch up other avenues, was put aside and the work completed. To keep the miles of road under modern conditions of traffic in a state befitting garden surroundings generally would leave little available for the host of other improvements awaiting funds ; so while work of this description is and can be done from garden funds proper at a time of financial stress it should be emphasised that to do so permanently can only result in stagnation of garden improvement as a whole. Needless to say while the roads were tackled nothing could be done towards revetment of the river bank, another perplexing and extraneous drain on garden resources.

The general plant collections in the garden were reasonably well maintained. A display of *Cacti* and other succulents and of palm and ornamental foliage plants put up in the Eden Gardens in December and January was much visited and admired by the crowds who flocked to the exhibition. The display of cold weather annuals was quite up to standard as was also the collection of Orchids.

2. **Plant and seed exchange.**—Over 25,000 plants were distributed, of which 9,450 were trees for roadside and other planting, 6,900 were shrubs and about 7,000 palms and surplus annuals, the distribution being as usual to Government institutions, District Boards, Railways and Municipalities. Besides these, 200 packets and 40 lbs. of seed were distributed to various gardens, scientific departments and private individuals throughout the world. Over 2,400 plants, mostly Orchids and bulbs, were received. The annual supply of mahogany seed from the West Indies did not reach the garden in germinable condition.

During the year two magnificent specimens of mahogany trees went from the Garden to the timber section of the British Empire Exhibition. They must date from the early history of the Garden, the annual rings in one proving this specimen to be well over 100 years old. Reports received states that the logs were too heavy to be dealt with entire. The intention was to put them into sections suitable for handling and to piece these together at the exhibition. Visitors from Bengal will be able to view a product unequalled in its line which has taken their province over a century to produce.

3. **Herbarium and Library.**—This section was under the care of Mr. Debbarman to whose industry and helpfulness acknowledgments are due. Valuable assistance was also rendered by Mr. V. Narayanswami of the Botanical Survey Department. Besides routine work on small collections, the early identification of which alone satisfies correspondents, and the more difficult work of attending to the large collections awaiting examination, some 7,300 named species were put into the herbarium during the year. About 1,200 sheets were out on loan in connection

with work on provincial floras. The publication of Mr. Burkill's "Flora of the Abor Expedition", a work which will run to at least three numbers of the Records of the Botanical Survey, is responsible for the holding back from publication of several papers of botanical interest. The result of work in the herbarium and library by members of the staff.

Library work has gone on as usual, the accessions being confined as far as possible to periodicals for which standing orders exist in order that arrears of library debts might be wiped off.

4. **Publications.**—No purely garden publications appeared during the year. The distribution of Part II of Volume XII of the Annals of the Garden, as well as the Appendix to Volume XI, is now almost finished. Arrangements for the publication by Professor Martelli of work left by Signor Beccari have been under discussion. It is hoped that funds will be available to continue the monumental work on palms which Signor Beccari's death interrupted.

5 **Financial.**—Out of a total budget allotment of Rs. 66,742 for staff and permanent establishment Rs. 55,098 were spent, leaving a saving of Rs. 11,644 which was effected mainly by Rs. 10,360 being saved under pay of Superintendent and Curator of the Herbarium. The temporary establishment allotment of Rs. 30,000 was utilised in full and\* from Rs. 27,120 granted under other heads Rs. 1,500 were saved. The net savings under all heads for the year amounted to Rs. 13,144. Revenue being sale proceeds of surplus plants and foreshore rent amounted to Rs. 3,916.

**Staff.**—Lieutenant-Colonel A. T. Gage, C.I.E., I.M.S., was on leave throughout the year, during which time the writer officiated as Superintendent. Mr. P. M. Debbarman officiated as Curator of the Herbarium, Mr. W. V. North was Curator, Mr. S. N. Basu, Assistant Curator and Mr. M. Jones, Overseer, throughout the year. The Head Clerk, Habu S. K. Mitra, was on leave from 2nd January 1924 till the end of the year during which time his place was conscientiously filled by the seventh clerk<sup>‡</sup>, Babu A. T. Banerji. All officers and the clerical staff have performed their duties satisfactorily.

### CALCUTTA GARDENS.

Until preparations for the exhibition began, work in these gardens followed the routine of previous years. From December onwards the appearance of the Eden Gardens was completely changed and after the close of the Exhibition much work became necessary to repair the inevitable destruction that had taken place. Help, wherever it could usefully be given, was extended to the Exhibition authorities during the period they remained in the occupancy of the garden.

The Dalhousie Square Garden suffered to some extent by the operations of the Improvement Trust in widening the street. Mr. Mitra, the Assistant Curator in charge of these gardens, deserves praise for the manner in which he carried out his multifarious duties, his work for the horticultural section of the Exhibition in particular being worthy of mention. The allotment for all these gardens was Rs. 31,976 on which there was a small net saving of Rs. 104.

### LLOYD BOTANIC GARDEN, DARJEELING.

The rainfall for the year was about 26 inches in defect, but, as the rain was well distributed throughout the rainy season, this shortage was not productive of any ill effects. With regard to the work, the year may be

characterised as one of severe struggle against adverse conditions. Apart from difficulties of a financial nature, against which the Lloyd Botanic Garden is having its struggle in common with many other departments, there have been difficulties of a nature associated with gardening in particular. Thus a simple order concerning milk on the part of the municipality had the effect—no doubt quite unsuspected by that body—of practically wiping out the trained malis of Darjeeling in so far as their garden work was concerned. A student of social conditions would find this a curious and interesting item of study, but it is a real hardship to one having charge of gardens, as the training of lads has to be commenced *de novo* and with unpromising, sometimes unwilling, material. There are also noticeable tendencies on the part of that class, from which malis used to be recruited, to drift from one occupation to another, to shun steady industry in a spirit of get-rich-quickly and to develop an attitude of impatience to restraint and discipline. Gardening is not a profession that can be taught in a few months, and the years of plodding work required to make any headway do not appeal to a class who see few and insufficient inducements offering and who may be feeling that changes are impending which may result in their being required to find employment other than that in which they will have trained themselves to be useful.

The above conditions notwithstanding, the Curator, Mr. Cave, has done best to maintain the garden and its collections of plants in good order and to add to the latter so far as possible. Stocks are again plentiful both for garden use and for distribution and it may be claimed that the garden is a place of pleasure and interest at any season of the year.

Some 130 species new to the garden were planted out and the collection and distribution of seeds of plants indigenous to the district continues. Requests for these seeds are now received from a world-wide area. One correspondent has informed another until facilities offered by the Lloyd Botanic Garden in the matter of procuring Eastern Himalayan seed would seem to have become generally known. It would be well that the facilities now offered were taken advantage of while the present Curator continues in office. With his retirement, now at no very distant date, Government loses an officer, whose knowledge of the local flora is unrivalled, and the botanical world services that would take one with aptitude for them years of industry to successfully render.

C. C. CALDER,

*Officer Superintendent,  
Royal Botanic Garden, Calcutta,*

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Annual Report of the  
Royal Botanic Garden  
and the Gardens in Calcutta  
and of the Lloyd Botanic Garden  
Darjeeling

For  
1923-24

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**ANNUAL REPORT**  
OF THE  
**ROYAL BOTANIC GARDEN AND THE GARDENS IN CALCUTTA**  
**AND OF THE LLOYD BOTANIC GARDEN, DARJEELING,**  
**FOR 1923-24.**

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**ROYAL BOTANIC GARDEN.**

**1. General.**—The year under review has not been altogether favourable from the horticulturist's standpoint. During the early part of the hot season, and again towards the end of the cold, there was an almost entire absence of rain in consequence of which the garden took on a parched appearance and a larger part of the labour force than is usually employed in caring for potted plants and beds in the open, had to be detailed to do watering work. This was the more unfortunate that labour itself was none too plentiful and that financial considerations dictated the strictest economy in its employ. The results of the prolonged periods of drought were not immediately apparent on trees and shrubs already well established, but a number subsequently dried and will require replacing.

The dry spell at the end of the year unfortunately gave opportunity for a form of damage that has become serious and much too frequent of recent years. Whether from visitor's thoughtlessly throwing away lighted matches or as a result of deliberate wickedness on the part of evil doers is difficult to say, but quite an abnormal number of fires have taken place of recent months. Some of them are difficult to account for on the assumption that accident was responsible.

Fires are not likely to break out spontaneously or accidentally on islands inaccessible to the visiting public, yet a large island in the King Lake suffered severely one night as a result of what must have been deliberate incendiarism. The object gained, whatever it may be, by this form of crime, must be satisfying for some malcontents but it is poor recompense for those who have laboured to make the garden a beauty spot for the crowds of visitors who now frequent it. A check kept at all the entrances to the gardens one day during the cold weather show a total of 1,540 visitors.

In spite of the discouragements above mentioned routine work directed to keep the garden in a fit and proper state went on throughout the year, and a certain amount of garden improvement was also found possible. This took the form of rearranging and restocking some of the plant houses. The Orchid house in particular having become dense and overgrown stood most in need of attention. The rearrangement brought about has added greatly to its attractiveness in rendering it lighter and opener and in

allowing the eye to take in the general effect at a glance. New beds and rockeries have been prepared while a number of desirable shade-loving species have been added to the collections. Similar work in certain of the remaining plant houses will be undertaken as opportunity and funds allow.

In last year's report mention was made of the very unsatisfactory condition of the garden roads. There being no special allotment available for the purpose it became imperative to divert part of the now reduced grant under contingencies to their renovation. They had reached a state when public disapprobation was justified and when indignation was already expressed in the form of side paths on the grass lawns running parallel with the main avenues. Although the funds could ill be spared from other urgent items of garden improvement, an amount sufficient to remake the whole length of the Banyan and to patch up other avenues, was put aside and the work completed. To keep the miles of road under modern conditions of traffic in a state befitting garden surroundings generally would leave little available for the host of other improvements awaiting funds; so while work of this description is and can be done from garden funds proper at a time of financial stress it should be emphasised that to do so would be a drain on garden resources.

The general plant collections in the garden were reasonably well maintained. A display of *Cacti* and other succulents and of palm and ornamental foliage plants put up in the Eden Gardens in December and January was well received and admired by the crowds who flocked to the as was also the collection of Orchids.

£5,000 plants were distributed, of which about 7,000 palms and surplus annuals, the distribution being as usual to Government institutions, District Boards, Railways and Municipalities.

and 40 lbs. of seed were distributed to various parts of the island. All plants throughout the island were received. The seeds from the West Indies did not reach the garden in germinable condition.

During the year some specimens of mahogany trees went from the garden to the Forest Section of the Forest Department. The mahogany trees from the early history of the Garden, the oldest being in the Forest Section, were to be preserved in sections suitable for study and to piece these together at the exhibition. Visitors from the Province will be able to view a product unequalled in its line which has taken their province over a century to produce.

3. Herbarium and Library.-This section was under the care of Mr. Debbarman to whose industry and helpfulness acknowledgments are due. On small collections, correspondents, and large collections awaiting the herbarium in connection during the year, About 1,200 sheets were received in connection



with work on provincial floras. The publication of Mr. Burkill's "Flora of the Abor Expedition", a work which will run to at least three numbers of the Records of the Botanical Survey, is responsible for the holding back from publication of several papers of botanical interest. The result of work in the herbarium and library by members of the staff.

Library work has gone on as usual, the accessions being confined as far as possible to periodicals for which standing orders exist in order that arrears of library debts might be wiped off.

4. **Publications.**—No purely garden publications appeared during the year. The distribution of Part II of Volume XII of the Annals of the Garden, as well as the Appendix to Volume XI, is now almost finished. Arrangements for the publication by Professor Martelli of work left by Signor Beccari have been under discussion. It is hoped that funds will be available to continue the monumental work on palms which Signor Beccari's death interrupted.

5 **Financial.**—Out of a total budget allotment of Rs. 66,742 for staff and permanent establishment Rs. 55,098 were spent, leaving a saving of Rs. 11,644 which was effected mainly by Rs. 10,360 being saved under pay of Superintendent and Curator of the Herbarium. The temporary establishment allotment of Rs. 30,000 was utilised in full and from Rs. 27,120 granted under other heads Rs. 1,500 were saved. The net savings under all heads for the year amounted to Rs. 13,144. Revenue being sale proceeds of surplus plants and foreshore rent amounted to Rs. 3,916.

**Staff.**—Lieutenant-Colonel A. T. Gage, C.I.R., I.M.S., was on leave throughout the year, during which time the writer officiated as Superintendent. Mr. P. M. Debarman officiated as Curator of the Herbarium, Mr. W. V. North was Curator, Mr. S. N. Basu, Assistant Curator and Mr. M. Jones, Overseer, throughout the year. The Head Clerk, Babu S. K. Mitra, was on leave from 2nd January 1924 till the end of the year during which time his place was conscientiously filled by the seventh clerk, Babu A. T. Banerji. All officers and the clerical staff have performed their duties satisfactorily.

### CALCUTTA GARDENS.

Until preparations for the exhibition began, work in these gardens followed the routine of previous years. From December onwards the appearance of the Eden Gardens was completely changed and after the close of the Exhibition much work became necessary to repair the inevitable destruction that had taken place. Help, wherever it could usefully be given, was extended to the Exhibition authorities during the period they remained in the occupancy of the garden.

The Dalhousie Square Garden suffered to some extent by the operations of the Improvement Trust in widening the street. Mr. Mitra, the Assistant Curator in charge of these gardens, deserves praise for the manner in which he carried out his multifarious duties, his work for the horticultural section of the Exhibition in particular being worthy of mention. The allotment for all these gardens was Rs. 31,976 on which there was a small net saving of Rs. 104.

### LLOYD BOTANIC GARDEN, DARJEELING.

The rainfall for the year was about 26 inches in defect, but, as the rain was well distributed throughout the rainy season, this shortage was not productive of any ill effects. With regard to the work, the year may be

characterised as One of severe struggle against adverse conditions. Apart from difficulties of a financial nature, against which the Lloyd Botanic Garden is having its struggle in common with many other departments, there have been difficulties of a nature associated with gardening in particular. Thus a simple order concerning milk on the part of the municipality had the effect—no doubt quite unsuspected by that body—practically wiping out the trained malis of Darjeeling in so far as their garden work was concerned. A student of social conditions would find this a curious and interesting item of study, but it is a real hardship to one having charge of gardens, as the training of lads has to be commenced *de novj* and with unpromising, sometimes unwilling, material. There are also noticeable tendencies on the part of that class, from which man<sup>8</sup> used to be recruited, to drift from one occupation to another, to shuff steady industry in a spirit of get-rich-quickly and to develop an attitude of impatience to restraint and discipline. Gardening is not a profession that can be taught in a few months, and the years of plodding work required to make any headway do not appeal to a class who see few and insufficient inducements offering and who may be feeling that changes are impending which may result in their being required to find employment other than that in which they will have trained themselves to be useful.

The above conditions notwithstanding, the Curator, Mr. Cave, has done best to maintain the garden and its collections of plants in good order and to add to the latter so far as possible. Stocks are again plentiful both for garden use and for distribution and it may be claimed that the garden is a place of pleasure and interest at any season of the year.

Some 136 species new to the garden were planted out and the collection and distribution of seeds of plants indigenous to the district continues. Requests for these seeds are now received from a world-wide area. One correspondent has informed another until facilities offered by the Lloyd Botanic Garden in the matter of procuring Eastern Himalayan seed would seem to have become generally known. It would be well that the facilities now offered were taken advantage of while the present Curator continues in office. With his retirement, now at no very distant date, Government loses an officer, whose knowledge of the local flora is unrivalled, and the botanical world services that would take one with aptitude for them years of industry to successfully render.

C. C. CALDER,

*Offg. Superintendent,*

*Botanic Garden, Calcutta.*

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ROYAL BOTANIC GARDEN.

1. **General.**—A period of drought during the year under review added to the difficulties of the already made perplexing by the necessity of reduced budget and exploring every avenue for the future. The months of April and May were a garden containing so many exotic species unaccustomed to the climate. To prevent mortality in such a best one can do is to replace as fast as possible and to nurse casualties back to health. Additions called for special attention during the year, and the Curator in Charge, throughout the year, done, deserves special mention for his praiseworthy round sickly plants and in the replacement of those that had Bother to stand the adverse conditions. The early had, however, a compensatory effect in restricting grass and undergrowth, and so rendering the lawns the garden, where mowing or sickling is regularly tively easy of maintenance. The rains were November and water, therefore, was available in sufficient quantity with an early running of the pumping plant for supply. Amongst operations of a routine nature the house which, so far as the beds are concurred two years ago has gained much ground collections here have now had themselves to the new beds, by the accession of consignments of glades have little to add to the visitors. Though closed to the public main shade house of the nursery is now Here the collections of foliage plants and housed and brought to a condition With a view to gradually on this nursery for variety made on them. A rearrangement was nation of what the collections of species were housed and locked main structure. Experience has elementary precaution, for it may not be *mali*, general garden worker or even cab the relative values of the different he is sometimes supposed to be. once in the collections have disappeared petty theft is an offence not confined to any garden.

to report is the perceptible abatement in that form of crime which has as its object only a wilful and senseless spoliation of plants and garden property to satisfy a craving for destruction and to prevent the enjoyment of others.

In common with annuals in the district this class of plant appeared very late in bloom, the long cold season no doubt being responsible for this. A collection of rose grafts for the garden: was acquired from North-West India at the beginning of the cold weather. Favoured by the length of this season they flourished exceedingly but showed signs of distress when the hoit weather arrived. Although in many parts of Jkmgal it can be grown well, the rose is a plant somewhat exacting in the conditions it demands for success. One sees very few of the species in Calcutta itself although as near to it as Barrackpore roses can be grown to great beauty and in variety. The Howrah side and Sibpur along with it unfortunately takes after the parent city in this respect and is in general unsuited to their cultivation.

Besides the usual routine work directed to keep the garden in a fit state certain other works towards the maintenance of garden accessories have been carried out. No less than 20,280 sq. yds, of road, subject to the incessant traffic of modern rubber wheeled vehicles, have had to be repaired. Repairs comprised the whole of the Hamilton Avenue, the College gate front, the Wallich Avenue from College gate to the probationers' quarters, parts of the Falconer and Roxburgh Avenues and the complete length of the Palmyra Avenue. In addition the Kyd monument and certain other garden structures were overhauled.

Reference has been made in recent reports to the state of the great Banyan tree. The decay that has set in, probably senile in the first place, has now become pronounced through the attacks of a virulent fungoid growth. It soon became evident that nothing would save the central column and that the only method of prolonging the life of the radical parts was to operate. At the time of writing the central portion has been completely removed and the decaying branches severed at points ahead of the disease. The intention is, as soon as the rains break, to transplant as large a stock as possible into the vacant space and when this gets established to graft it to the old plant. Owing to the great age and magnitude of the branches success--will be doubtful but nothing short of this drastic treatment now offers any chance for the tree. Although conditions are bad at its centre, the Banyan shows no signs of this externally, and in respect of symmetry the number of aerial roots fixed in the ground and area covered must still remain the finest specimen of its kind in existence.

**2. Plant and seed exchange.**—Interchange of plants and seeds with other Botanical, Agricultural and Forestry Departments and with private individuals has been well maintained throughout the year. Some 17,654 plants were distributed, of which 9,100 were trees for road side and other planting, 3,851 were shrubs and 4,438 palms and surplus annuals. The balance was made up of climbers, bamboos, ferns and orchids. As is usual many of these went to Government institutions, District Boards, railways and municipalities.

In order that the plants collected- by Mr. Kingdom Ward during his visit to Tibet and the Brahmaputra gorge might not have to suffer by any excessive delay in getting conditions for their growth, six large wardian cases for despatch to England were prepared in anticipation



of his arrival. Into these went the wonderful collection. A few rhododendrons and magnolia cuttings from Ward handed over plants brought back for the garden. Mr. W. Journey they that a number so much the worst lot. They would never have travelled to England and they were immediately attended to, but it is too early yet to say in the they have already had combined with the great number

foundings may not prove too much. In the general receipt side is to be seen a collection of some 1,482 plants, many of them orchids. 28 lbs. of seeds were distributed and 127 packets received.

3. Herbarium and Library.-The continuity in the post of second assistant for systematic work and the absence of the officiating Curator of the Herbarium, the work in this department devolving on Mr. one officer only to do the duties anything beyond general routine work. The plants were reasonably well maintained, and a part of Narayanaswami's part made to incorporate the thousand lying outside their proper cabinets. The result is commensurate with the labour this has involved. It is much to work without fear of having one's material mixed with the others and "sheets lying about. In the aggregate some 11,000 sheets were incorporated. These include collections from America and Burma as well as certain foreign representatives.

plants, the writer's and and representative collections made by Forest officers and others in Burma.

the numerous consignments were made on behalf of the numerous correspondents who continue to take advantage of the facilities for such work.

collection of Indian and Malayan duplicates in the Botanical Department cases of Eastern Himalayan material collected by Mr. Narayanaswami were sent for the use of the Universities in connection with the botanical

Library is now free of arrears of debt and a normal number of additions has been made to it.

44. Publications. No purely garden work was completed in the year, but the distribution of Part II of Vol. II of the garden, as well as the Appendix to the work far as the notional affairs in certain of the other by Professor left at his death by Signor Heccan and a promise has been made that funds permit the cost of the plates of the volume will be met. The first of the Botanical Survey is ready and work and continued as a work of the Press.

Hooker's

**5. Financial.**—Out of a total budget allotment of Rs. 1,07,038 Us. 1,06,461-15-2 were spent. There was a saving<sup>1</sup> of Us. 5,256-7-10 mainly under " Subordinate garden staff "" and " Clerical establishment ", but this is almost absorbed by an excess of Us. 4,680-7 mainly due to increase in pay of the officiating Curator of the Herbarium and inclusion of leave allowance of the Curator of the Garden. The grant of Us. 29,468 for temporary establishment was spent in full as was also the allowance of Us. 14,000 for contract contingencies.

**6. Staff.**—Lieutenant-Colonel A. T. Gage, C.I.E., I.M.S., was on leave throughout the year, during which time the writer officiated as Superintendent. Up till the 13th October 1924 Mr. M. Debbarman officiated as Curator of the Herbarium. From this date till the end of the year he was absent on leave through sickness. His place was taken by Mr. V. Narayanaswami who continued to act as Curator of the Herbarium in addition to his own duties till the end of the year. Mr. W. V. North was Curator of the Garden from the 1st April till the 23rd May and again from the 24th January till the end of the year. During the early part of his absence on leave Mr. S. N. Bose officiated as Curator; thereafter Mr. N. Mitra took charge. The post of Assistant Curator was held first by Mr. S. N. Iyasu and afterwards while this officer acted, by Mr. Merlin Jones. Mr. Safdar Khan acted as Overseer from the 1st October 1924 till the 19th January 1925. The Head Clerk, J. J. S. K. Mitra, was on leave from the 1st April till the 1st May 1924, J. J. A. T. Jkinerji, seventh clerk, being selected to perform the duties of Head Clerk during this officer's leave. All officers and the clerical staff have given satisfaction in the performance of their duties.

### CALCUTTA GARDENS.

Apart from routine work in these gardens there devolved on the staff the duty of repairing the extensive damage done to the Eden Garden while it was temporarily occupied by the Calcutta Exhibition authorities. In the course of erection of structures for this exhibition numbers of plants were damaged and some had to be removed altogether. The ride was left without a blade of grass on it; the Canna garden, from which all collections had been removed to avoid destruction, presented a desolate appearance and the garden throughout was strewn with bricks, concrete foundations and the usual débris that such an event leaves in its wake. As other funds were not made available, it was inevitable that the budget allotment should first be directed towards repairs and, if during the first half of the year complaints as to the condition of the garden were freely made public in the Press, it was beyond the power of the staff to bring it to a presentable condition earlier and at the same time retain enough money in hand to meet inevitable expenditure in the last months of the year. With the help of a Ford Tractor kindly loaned by the Company supplying these the ride was brought back to condition and returned, the Canna garden was replanted and rubbish having been removed, casualties in the permanent collections made good. Although there are still evidences of the exhibition in relics of broken masonry, dismantled seats and gaping breaches in a few hedges the garden is well back to its former condition and has now regained the popularity it previously had as a place of resort for the Calcutta public.

New accessions to the Eden Garden include a collection of hybrid Dahlia bulbs received from Europe.

In the other Calcutta gardens the year's work of a routine character. As elsewhere, cold weather has done several beds in the Curzon Gardens eventually repaired, the trouble over them and were much admired by the public, are due thanks BOHU, Quasem Ali and Safdar Khan, the officers in charge, for the manner in which they carried out repairs to the garden staff, but there was an excess of Rs. 101-0 in the budget. The net saving was Rs. 716-2 on the pay of Assistant Curator. The net saving was Rs. 28,870-6 were spent.

Of the full budget allotment of Rs. 28,870-6 were spent. There was an excess of Rs. 101-0 in the budget. The net saving was Rs. 716-2 on the pay of Assistant Curator. The net saving was Rs. 28,870-6 were spent.

### LLOYD BOTANIC GARDEN, DARJEELING.

The rainfall for the year was 120-gal, although rain commenced early, the fall was well distributed as is the 23rd October. The fall was not measureable amount shown by the number of days, 45 only, in which no severe damage to both exotic and indigenous plants in the local forests was recorded. The cold season, in many years, was responsible for a certain amount of damage to both exotic and indigenous plants in the local forests while certain plants in the local forests the following were the chief and other species, *Jussiaea peruviana*, *Doryanthes Palmeri*, and *Curculigo recurvata*. All these species are in Darjeeling.

As a consequence of the efforts made to bring the garden paths and strict economy practised with regard to cold season. Certain decaying wooden fencing, the steepest of the paths have been paved with stone blocks and an effort, more prolonged and determined made to rid the lawns and plants of moss. Some new to the garden were planted out in the year and a few examples which have been replaced.

In addition to garden work plants has been carried out as in this Garden there was a rate and taxes, out of a total budget allotment of Rs. 20,944. The high standard of Mr. frequently referred to in these to comment on it further. Since year of his service this standard has been a

C. C. CALDER,  
Superintendent,

Royal Botanic Garden, Calcutta.



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Lloyd Botanic Garden, Darjeeling**

For the Year

1924-25

CALCUTTA:  
Bengal Secretariat Book Depot.

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# Annual report of the Royal Botanic Garden and the Gardens in Calcutta and of the Lloyd Botanic Garden, Darjeeling, for 1924-25-

## ROYAL BOTANIC GARDEN.

1. **General.**—A period of drought during the first few months of the year under review added to the difficulties of gardening operations already made perplexing by the necessity of accommodating oneself to a reduced budget and exploring every avenue for the reduction of expenditure. The months of April and May were exceedingly hot and dry for a garden containing so many exotic species unaccustomed to extremes of climate. To prevent mortality in such circumstances is impossible. The best one can do is to replace as fast as inroads on the collections are made and to nurse casualties back to health. Additions to the garden therefore called for special attention during the year, and Mr. Mitra, officiating Curator in charge throughout the period when planting-out could be done, deserves special mention for his praiseworthy efforts in bringing round sickly plants and in the replacement of those that had failed altogether to stand the adverse conditions. The early period of drought had, however, a compensatory effect in restricting the development of grass and undergrowth, and so rendering the lawns and other parts of the garden where mowing or sickling is regularly carried on comparatively easy of maintenance. The rains were prolonged into the month of November and water, therefore, was available in sufficient quantity to dispense with an early running of the pumping plant for supply to garden lakes.

Amongst operations of a routine nature the renovation and enlargement of collections under cover may be specially mentioned. The Orchid house which, so far as the beds are concerned, was reconstructed two years ago has gained much through the attention paid to it. The ground collections here have now had time to completely accommodate themselves to the new beds, while the hanging collections renewed by the accession of consignments of orchids from the Assam jungles leave little to add to the attractiveness of this, the favourite resort for visitors. Though closed to the public and therefore little known, the main, shade house of the nursery is now second to none in the garden. Here the collections of foliage plants and in particular of palms in pots are housed and brought to a condition suitable for exhibit in the out-houses. With a view to gradually increasing the out collections so dependant on this nursery for variety and effectiveness efforts were made during the year to bring the stock collections to a state fit to meet any demand made on them. A rearrangement was effected allowing of easy determination of what the collections contained and the more valuable or rarer species were housed and locked off in a secondary enclosure within the main structure. Experience has demonstrated the utility of this elementary precaution, for it may not be generally known that the local *mali*, general garden worker or even casual visitor is not so ignorant of the relative values of the different plants he has opportunity to handle as he is sometimes supposed to be. Losses there have been and plants once in the collections have disappeared and reappeared on sale, but petty theft\* is an offence not confined to any garden. What is pleasant

to report is the perceptible abatement in that form of crime which has as its object only a wilful and senseless spoliation of plants and garden property to satisfy a craving for destruction and to prevent the enjoyment of others.

In common with annuals in the district this class of plant appeared very late in bloom, the long cold season no doubt being responsible for this. A collection of rose grafts for the garden: was acquired from North-West India at the beginning of the cold weather. Favoured by the length of this season they flourished exceedingly but showed signs of distress when the hot weather arrived. Although in many parts of Bengal it can be grown well, the rose is a plant somewhat exacting in the conditions it demands for success. One sees very few of the species in Calcutta itself although as near to it as Burraekpore roses can be grown to great beauty and in variety. The Howrah side and Sibpur along with it unfortunately takes after the parent city in this respect and is in general unsuited to their cultivation.

Besides the usual routine work directed to keep the garden in a fit state certain other works towards the maintenance of garden accessories have been carried out. No less than 20,280 sq. yds. of road, subject to the incessant traffic of modern rubber wheeled vehicles, have had to be repaired. Repairs comprised the whole of the Hamilton Avenue, the College gate front, the Wallich Avenue from College gate to the probationers' quarters, parts of the Falconer and Roxburgh Avenues and the complete length of the Palmyra Avenue. In addition the Kyd monument and certain other garden structures were overhauled.

Reference has been made in recent reports to the state of the great Banyan tree. The decay that has set in, probably senile in the first place, has now become pronounced through the attacks of a virulent fungoid growth. It soon became evident that nothing would save the central column and that the only method of prolonging the life of the radical parts was to operate. At the time of writing the central portion has been completely removed and the decaying branches severed at points ahead of the disease. The intention is, as soon as the rains break, to transplant as large a stock as possible into the vacant space and when this gets established to graft it to the old plant. Owing to the great age and magnitude of the branches success will be doubtful but nothing short of this drastic treatment now offers any chance for the tree. Although conditions are bad at its centre, the Banyan shows no signs of this externally, and in respect of symmetry the number of aerial roots fixed in the ground and area covered must still remain the finest specimen of its kind in existence.

**2. Plant and seed exchange.**—Interchange of plants and seeds with other Botanical, Agricultural and Forestry Departments and with private individuals has been well maintained throughout the year. Some 17,654 plants were distributed, of which 9,100 were trees for road side and other planting, 3,851 were shrubs and 4,438 palms and surplus annuals. The balance was made up of climbers, bamboos, ferns and orchids. As is usual many of these went to Government institutions. District Boards, railways and municipalities.

In order that the plants collected by Mr. Kingdom Ward during his visit to Tibet and the Bralim.apn.tra gorge might not have to suffer by any excessive delay in getting conditions for their growth, six large wardian cases for despatch to England were prepared in anticipation



of his arrival. Into these went the wonderful collection of bulbs, rhododendrons and magnolia cuttings brought back. Besides a few plants brought back for the garden Mr. Kingdom Ward handed over a number so much the worst for the long' journey they had made that they would never have travelled to England alive. They were immediately attended to, but it is too early yet to say whether the journey they have already had combined with the great change in their surroundings- may not prove too much for them.

In the general receipt side is to be recorded a collection of some 1,482 plants, many of them orchids. Packets to the number 286 and 28 lbs. of seeds were distributed and 127 packets received.

3. **Herbarium and Library.**—The continued vacancy in the post of second assistant for systematic work and the absence on sick leave of the officiating Curator of the Herbarium has resulted in much of the work in this department devolving on Mr. Narayanaswami. With one officer only to do the duties of three it was impossible to attempt anything beyond general routine work. The plants already incorporated were reasonably well maintained and a praiseworthy attempt on Mr. Narayanaswami's part made to incorporate the thousands of sheets lying outside their proper cabinets. The result attained is commensurate with the labour this has involved. The herbarium looks much the cleaner for the arrangement made and there is now room to work without fear of having one's material mixed with loose collections and sheets lying about. In the aggregate some 11,000 sheets were incorporated. These include collections from all over India and Burma as well as certain foreign representatives from Africa, America and China. The most noteworthy additions are Mr. Narayanaswami's own collections from the Rampa country, Mr. Fischer's Madras Presidency plants, the writer's and Mr. Ramaswami's South Indian collections and representative collections made by Forest officers and others in Burma.

Identifications of current consignments were made on behalf of the numerous correspondents who continue to take advantage of the facilities afforded by Sibpur for such work..

Distributions include a large collection of Indian and Malayan duplicates to help swd build up an herbarium in the Botanical Department of the University of Allahabad. Small cases of Eastern Himalayan material collected by the writer and garden material collected by Mr. Narayanaswami were sent for the use of Edinburgh and Aberdeen diversities in connection with the botanical training of Forestry students.

The library is now free of arrears of debt and a normal number of additions has been made to it.

4. **Publications.**—No purely garden publications appeared during the year, but the distribution of Part II of Vol. XII of the Annals of the garden, as well as the Appendix to Vol. XI was completed so far as the national affairs in certain countries would allow. The work left at his death by Signor Becari is being brought together by Professor Martelli and a promise has been given that, so far as funds permit, the cost of publication of the plates necessary to illustrate the volume will be met. A list of Indian species of plant not appearing in Hwtes Flora of British India—a compilation started as a library work and continued as a work of the Botanical Survey—is ready and about to go to Press.

Hooker's

**5. Financial.**—Out of a total budget allotment of Rs. 1,07,038 Rs. 1,06,401-15-2 were spent. There was a saving of Rs. 5,256-7-10 mainly under "Subordinate garden staff" and <sup>4\*</sup> Clerical establishment", but this is almost absorbed by an excess of Rs. 4,680-7 mainly due to increase in pay of the officiating Curator of the Herbarium and inclusion of leave allowance of the Curator of the Garden. The grant of Rs. 29,468 for temporary establishment was spent in full as was also the allowance of Rs. 14,000 for contract contingencies.

**6. Staff.**—Lieutenant-Colonel A. T. Gage, C.I.E., I.M.S., was on leave throughout the year, during which time the writer officiated as Superintendent. Up till the 13th October 1924 Mr. M. Debbannan officiated as Curator of the Herbarium. From this date till the end of the year he was absent on leave through sickness. His place was taken by Mr. V. Narayanaswami who continued to act as Curator of the Herbarium in addition to his own duties till the end of the year. Mr. W. V. North was Curator of the Garden from the 1st April till the 23rd May and again from the 24th January till the end of the year. During the early part of his absence on leave Mr. S. N. Hose officiated as Curator; thereafter Mr. N. Mitra took charge. The post of Assistant Curator was held first by Mr. S. N. Hasu and afterwards while this officer acted, by Mr. Merlin Jones. Mr. Safdar Khan acted as Overseer from the 1st October 1924 till the 19th January 1925. The Head Clerk, Habu S. K. Mitra was on leave from the 1st April till the 1st May 1924, liabu A. T. Jjanerji, seventh clerk, being selected to perform the duties of Head Clerk during this officer's leave. All officers and the clerical staff have given satisfaction in the performance of their duties.

### CALCUTTA GARDENS.

Apart from routine work in these gardens there devolved on the staff the duty of repairing the extensive damage done to the Eden Garden, while it was temporarily occupied by the Calcutta Exhibition authorities. In the course of erection of structures for this exhibition numbers of plants were damaged and some had to be removed altogether. The ride was left without a blade of grass on it; the Canna garden, from which all collections had been removed to avoid destruction, presented a desolate appearance and the garden throughout was strewn with bricks, concrete foundations and the usual debris that such an event leaves in its wake. As other funds were not made available, it was inevitable that the budget allotment should first be directed towards repairs and, if during the first half of the year complaints as to the condition of the garden were freely made public in the Press, it was beyond the power of the staff to bring it to a presentable condition earlier and at the same time retain enough money in hand to meet inevitable expenditure in the last months of the year. With the help of a Ford Tractor kindly loaned by the Company supplying these the ride was brought back to condition and returned, the Canna garden was replanted and rubbish having been removed, casualties in the permanent collections made good. Although there are still evidences of the exhibition relics of broken masonry, dismantled seats and gaping breaches in a few hedges the garden is well back to its former condition and has now regained the popularity it previously had as a place of resort for the Calcutta public.

New accessions to the Eden Garden include a collection of hybrid Dahlia bulbs received from Europe.

In the other Calcutta gardens the year's work was mostly of a routine character. As elsewhere, cold weather annuals were late but several beds in the Curzon Gardens eventually repaid the trouble taken over them and were much admired by the passing public. To Messrs. Mitra, Uasu, Quasem Ali and Safdar Khan, the officers in charge, are due thanks for the manner in which they (carried out repairs and brought the gardens back to condition.

Of the full budget allotment of Es. 29,48G, Es. 28,870-C were spent, There was an excess of Its. 101-9 in the grant for garden staff, but this is more than set off by a saving of Es. 716-2 on the pay of Assistant Curator. The net saving was Its. 615-10.

### LLOYD BOTANIC GARDEN, DARJEELING.

The rainfall for the year was 120.38 inches being slightly in defect although rain commenced early, the 11th April and continued till late—the 23rd October. The fall in this interval was well distributed as is shown by the number of days, 45 only, in which no measureable amount was recorded. The cold season, the dullest and most severe recorded for many years, was responsible for a certain amount of damage to both exotic and indigenous plants in the permanently planted-out collections, while certain plants in the local forests also felt its effects. Amongst exotics the following were the chief sufferers—*Cestrum aurantiacum* and other species, *Jussiaea peruviana*, *Jussiaea macrostemma* and other species and *Doryanthes Palmieri* and of indigenous plants from levels lower than Darjeeling the following—*Luculia gratissima*, *Cassia Icevifolia*, *Solanum verbascifolium*, *Saurauja fasciculata*, *Musa nepalensis* and *Curculigo recurvata*. All these species are ordinarily quite hardy in Darjeeling.

As a consequence of the efforts made during the past two years to bring the garden paths and structures into good condition and the strict economy practised with regard to labour during the year, it has been found possible to carry out a few improvements during the past cold season. Certain decaying wooden railings have been replaced by iron fencing, the steepest of the paths—difficult to maintain if metalled—have been paved with stone blocks, revetment walls have been erected and an effort, more prolonged and determined than usual, has been made to rid the lawns and plants of moss. Some 78 species of plants new to the garden were planted out in the permanent collections during the year and a few examples which had become old, decrepit or damaged by storms were replaced.

In addition to garden work proper distribution of local seeds and plants has been carried out as in previous years.

In this Garden there was a saving of Es. 98-7-7, mostly under rents, rates and taxes, out of a total budget allotment of Us. 20,944.

The high standard of Mr. Cave's work in all directions has been so frequently referred to in these reports that it is, perhaps, unnecessary to comment on it further. Suffice it to say, therefore, that in the present year of his service this standard has been amply maintained.

C. C. CALDER,

Superintendent,

Royal Botanic Garden, Calcutta.



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## ROYAL BOTANIC GARDEN.

1. **General.**—Climatic conditions throughout the period under review may be described as normal for horticultural operations.

the hot season/Exotics benefited by the timely rains and again on account of the well distributed monsoon though there was a slight set back to this class of plant in August and September when the monsoon weakened and became irregular. All classes of plants stood the dry cold weather well although the absence of any rain of ^sequence during this season involved additional care in watering the beds of annuals in the open and foliage plants in the shade houses. The display of orchids was enriched by a timely arrival of a consignment of these plants from Assam and was quite up to the standard; visitors have learned to expect and appreciate. There is no part of the garden so popular as the orchid house when its somewhat sombre background is relieved by the brilliant sprays of *Coelogyne*, *Phalaenopsis*, *Vandas* and especially *Dendrohium* that the end of the season brings out.

While no additional vistas have been opened out the policy of lopping the low hanging or unsightly under branches <math>J?TM^\* \text{ and } \text{and}</math> shrubs, in denser parts of the garden has been carried on. The benefit is apparent in a more open park like aspect to the garden and in glimpses of distant lawns, palm clumps and lily strewn waterways. Although the garden cannot be called rich in respect of the number of species contained it still presents in many directions a dense crowded appearance and the rearrangement planned and carried out for some years by its late head is being followed, to completion now with marked improvement in the general scenic effect. A counterpart to this work has been the addition of specie\*\* unrepresented in the garden. Numbers of new species have found permanent sites in their proper geographical areas and the additions will continue as the work of eliminating superfluous specimens goes on.

With finances in such unfortunate conditions as those of the garden no special work of any magnitude could be carried out but a very commendable attempt on the part of the Curator was made to bring certain roads into a safe and pleasurable state for traffic. In furtherance of the policy of curtailing expenditure a demand was made that such avenues as could most conveniently be closed to the public should be turned into grass ways and their metal and soling utilized to complete repairs on the main and more frequented roads. Materials from the Mann, Royle and parts of Buimlis, Wight and a path near the Dyer avenues all of which were abolished as public ways allowed, with such fresh road making material as could be bought, of the renovation of parts of the Griffith, Dyer, Kurz, Kyd, Anderson, Clarke, Brandis and King avenues. In general the garden roads may now be said to be in a fair state of repair although none of them are in a condition or indeed constructed to stand for any length of time the wear and tear that modern traffic entails.

No fresh revetment works apart from patching was possible on the river bank, but some 14,100 cubic feet of soil was excavated from a lake near the Overseer's quarters and dumped in river side wash-outs. Reference was made in last year's report to the decaying state of the great Banyan tree and proposals for dealing with it indicated. The young Banyans planted in the excised centre of the main growth are thriving well but are still too small to make possible the delicate operation of grafting to the old stock-

2. **Plant and seed exchange.**—Some 41,916 plants were distributed of which 21,095 were trees for roadside and other planting, 11,455 were shrubs and 6,916 palms and surplus annuals. As usual these went to Government institutions, district boards, railways and municipalities. The balance was made up of climbers, bamboos, ferns and orchids. Receipts number some 2,703 plants. Eighty-six packets and 80 lbs. of seeds were distributed and 60 packets received in addition to barrels of Mahogany seed from Kew. Requests for *Taraktogenos* and *Hydnocarpus* seed, of use in Leprosy, are particularly numerous and special arrangements have been made to secure supplies of the latter from South India as garden supplies fall far short of the demand. Seeds of both these genera rapidly lose their power of germination unless carefully collected and packed and at present experiments are under trial to test the value of different methods of packing. The range of distribution of the seeds sent out has, as usual, been practically world-wide.

3. **Herbarium and Library.**—As a direct result of the combination of appointments of Curator of the Herbarium with Systematic Assistant in the Botanical Survey of India all the more technical duties in this department fell to Mr. V. Narayanaswami. Collections have been enriched by the incorporation of some 5,228 sheets of named-duplicates of which roughly one-third was Indian and two-thirds foreign species. The Indian portion consisted of plants from the Ramnagar Agency, the N.-W. Himalaya, Assam and Burma while foreign accessions comprised material from Africa, America, China, the Malay Archipelago and Siam. The Curator's herbarium also received further additions during the year making it more representative of the flora of the garden. Space in the existing cabinets is becoming a question of pressing importance and only a limited amount of further incorporation can go on. Some thousands of specimens were identified for correspondents and the herbarium was visited during the year by several interested correspondents and students wishing to consult particular plants or collections contained therein. Distributions include some 3,642 named sheets to the University of Allahabad and to correspondents in Japan. About 2361 sheets were out on loan to Mr. Gamble and others for purposes of scientific study.

Less than the usual number of additions was made to the library on account of the conserving of funds for the preparation of botanical plates being undertaken in Italy. There is a noticeable tendency on the part of research workers in India to use the facilities now afforded of having certain publications on loan.

4. **Publications.**—No purely garden publications were issued during the year but the work on Asiatic Palms left by Signor Beccan has been brought together by Professor Martelli and is now with the Press.



5. Financial.-Out of a total budget allotment of Rs. 54,919 for staff and permanent establishment Rs. 48,000 were spent leaving a saving of Rs. 6,919, which was mainly effected by a reduction in expenditure on the pay of the post of Curator of the Herbarium. The temporary establishment allotment of Rs. 30,000 was practically all utilized and saved. The

nue, being sale proceeds of surplus plants, etc., amounted to Rs. 0.

6. Staff.-Lieutenant-Colonel A. T. Gaire C.I.K., I.M.S., wife, was on leave, retired from Government service on the 2nd May, and the writer was confirmed in his officiating post, and held charge throughout the year. The department had a severe blow in the death in June 1925 of Mr. H. B. H. M. I. A. R. who, prior to taking leave, acted as Curator of the Herbarium. Sir. Debbarman's quiet and unobtrusive industry and his capacity to render himself generally helpful in the diverse work he held, makes his loss the greater to Government. Mr. V. Narajanaianu, Assistant for Systematic work in the Botanical Survey, who acted as Curator of the Herbarium during Mr. Debbarman's illness, continued so to act till the end of the year in addition to his own duties. Apart from short periods during which minor acting arrangements were made the following officers held charge of their respective posts throughout the year: Mr. W V North, Curator; Mr. S. N. Basu, Assistant Curator; Mr. Jones, Overseer, Royal Botanic Garden; Mr. N. Mitra, Assistant Curator; Mr. Quasem Ali, Overseer, Government Gardens, Calcutta. Mr. Cave was Curator of the Lloyd Botanic Garden, Barreling, till the 11th November 1925 when he proceeded on long leave prior to retirement, being relieved by Mr. Mitra who in turn gave over charge to Mr Leslie. With Mr. Cave's retirement Government loses an officer of very exceptional ability and attainments. His knowledge of the flora of the Eastern Himalaya and his industry in making this knowledge of use to botanical and horticultural institutions gave the Lloyd Botanic Garden something of a world-wide reputation. There is scarcely a botanical institution in the world interesting itself in matters that concern plant introduction that has not at one time or other benefited by Mr. Cave's services. Babu Santosh Kumar Mitra was head clerk till the 11th June 1925 when he was relieved by Babu Ashutosh Banerjee who acted till the end of the year. All officers and the clerical establishment have performed their duties satisfactorily.

### CALCUTTA GARDENS.

Work in these gardens was mainly of a routine character and calls for no special comment. The display of annuals while somewhat late was up to the usual standard of excellence. A special rose garden was started and a number of fresh additions made to the permanent collections including species of *Mongnoha*, *Cinamomum*, *Ithyllanthus*, *Cassia*, *Croton* and *Dracaena*. The repair of roads in all the garden entailed strict economy in the utilisation of the grant made. The paths are now in a good state and bear traffic similar to those in the other gardens. The Government will not be making similar arrangements in the future. On the 29th June, Rs. 29,036, Rs. 25,829 were spent leaving the small saving of Rs. 3,207.

## LLOYD BOTANIC GARDEN, DARJEELING.

The rainfall for the year was 124 inches being about normal and its distribution was, on the whole, favourable for garden operations. Snow which fell to a depth of a foot in January in the garden area did a certain amount of damage but nothing that expert pruning could not make good. In this storm it was noticed that the *Grevilleas*, *biicalypts* and certain of the Oaks suffered most. The large number of Connors in the permanent collections stood the storm well and only a few other plants had branches broken under weight of the snow.

The usual routine work of the garden was carried on during the year, borne seventy-six young trees and shrubs were planted out to replace casualties or as new species to the garden. One of the steeper paths was laid with stone paving and several roads repaired. The Curator went on a collecting expedition to Sikkim during May and the Lepcha collector went as far as the Nepal frontier in quest of the annual collections of Himalayan seeds. At other times collecting work has gone on more locally.

Some 4,038 plants; 2,118 dozen seedlings, 245 bulbs and tubers and 13,785 packets of seeds were distributed and the usual number of plants and seeds received.

Visitors to the gardens totalled about 45,000, a number which shows their popularity as a resort for educational or pleasureable pursuits.

Under Mr. Leslie's care the garden is maintaining its high standard of excellence and efforts are being made to carry on in skeleton form the valuable collection branch which formed a special feature of Mr. Cave's report. The full allotment for this garden was Es. 23,118 against a total expenditure of Rs. 23,160. The excess which was adjusted by the Accountant-General was due to leave allowance of Sir. Cave.

C. C. CALDER,

*Superintendent,*

*Loyal Botanic Garden, Calcutta.*



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**ROYAL BOTANIC GARDEN.**

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No fresh revetment works apart from patching was possible on the river bank, but some 14,000 cubic feet of soil was excavated from a lake near the Overseer's quarters and dumped in river side wash-pu. Reference was made in last year's report to the decaying state of the great Banyan tree and proposals for dealing with it indicated. A young Banyans planted in the excised centre of the main growth are thriving well but are still too small to make possible the delicate operation of grafting to the old stock-

2. **Plant and seed exchange.**—Some 41,916 plants were distributed of which 21,095 were trees for roadside and other planting, 11,455 were shrubs and 6,916 palms and surplus annuals. As usual these went to Government institutions, district boards, railways and municipalities. The balance was made up of climbers, bamboos, ferns and orchids. Receipts number some 2,703 plants. Eighty-six packets and 80 lbs. of seeds were distributed and 60 packets received in addition to barrels of Mahogany seed from Kew. Requests for *Taraktogenos* and *Hydnor* seed, of use in Leprosy, are particularly numerous and special arrangements have been made to secure supplies of the latter in South India as garden supplies fall far short of the demand. Seeds of both these genera rapidly lose their power of germination unless carefully collected and packed and at present experiments are undertaken to test the value of different methods of packing. The range of distribution of the seeds sent out has, as usual, been practically world-wide.

3. **Herbarium and Library.**—As a direct result of the combination of appointments of Curator of the Herbarium with Systematic Assistant in the Botanical Survey of India all the more technical duties in the department fell to Mr. V. Narayanaswami. Collections have been enriched by the incorporation of some 5,228 sheets of named specimens of which roughly one-third was Indian and two-thirds foreign species. The Indian portion consisted of plants from the Rampa Agency, N.-W. Himalaya, Assam and Burma while foreign accessions comprises material from Africa, America, China, the Malay Archipelago and Siam. The Curator's herbarium also received further additions during the year making it more representative of the flora of the garden. Space in the existing cabinets is becoming a question of pressing importance and only a limited amount of further incorporation can go on. Some thousands of specimens were identified for correspondents and the herbarium was visited during the year by several interested correspondents and students, wishing to consult particular plants or collections contained therein. Distributions include some 3,042 named sheets to the University of Allahabad and to correspondents in Japan. About 2,361 sheets were out on loan to Mr. Gamble and others for purposes of scientific study.

Less than the usual number of additions was made to the library on account of the conserving of funds for the preparation of botanical plates being undertaken in Italy. There is a noticeable tendency on the part of research workers in India to use the facilities now afforded of having certain publications on loan.

4. **Publications.**—No purely garden publications were issued during the year but the work on Asiatic Palms left by Signor Beccan has been brought together by Professor Martelli and is now with the Press.

5- **Financial.**—Out of a total budget allotment of Rs. 54,919 for staff and permanent establishment Rs. 48,000 were spent leaving a saving of Rs. 6,919, which was mainly effected by a reduction in expenditure on the pay of the post of Curator of the Herbarium. The temporary establishment allotment of Rs. 30,000 was practically all utilized and from Rs. 34,720 granted under other heads Rs. 725 were saved. The net saving under all heads for the year amounted to Rs. 7,645. Revenue, being sale proceeds of surplus plants, etc., amounted to Rs. 725.

6. **Staff.**—Lieutenant-Colonel A. T. Gage, C.I.E., I.M.S., who was on leave, retired from Government service on the 2nd May 1925, and the writer was confirmed in his officiating appointment from that date and held charge throughout the year. The department suffered a severe blow in the death in June 1925 of Mr. P. M. Debbarman who, prior to taking leave, acted as Curator of the Herbarium. Mr. Debbarman's quiet and unobtrusive industry and his capacity to render himself generally helpful in the diverse duties of the post he held, makes his loss the greater to Government. Mr. V. Narayanaswami, Assistant for Systematic work in the Botanical Survey, who acted as Curator of the Herbarium during Mr. Debbarman's illness, continued so to act till the end of the year in addition to his own duties. Apart from short periods during which minor acting arrangements were made the following officers held charge of their respective posts throughout the year: Mr. W. V. North, Curator; Mr. S. N. Basu, Assistant Curator; Mr. Jones, Overseer, Royal Botanic Garden; Mr. N. Mitra, Assistant Curator; Mr. Quasem Ali, Overseer, Government Gardens, Calcutta. Mr. Cave was Curator of the Lloyd Botanic Garden, Darjeeling, till the 11th November 1925 when he proceeded on long leave prior to retirement, being relieved by Mr. Mitra who in turn gave over charge to Mr. Leslie. With Mr. Cave's retirement Government loses an officer of very exceptional ability and attainments. His knowledge of the flora of the Eastern Himalaya and his industry in making this knowledge of use to botanical and horticultural institutions gave the Curator of the Lloyd Botanic Garden something of a world-wide reputation. There is scarcely a botanical institution in the world interesting itself in matters that concern plant introduction that has not at one time or other benefited by Mr. Cave's services. Babu Santosh Kumar Mitra was head clerk till the 11th June 1925 when he was relieved by Babu Ashutosh Banerjee who acted till the end of the year. All officers and the clerical establishment have performed their duties satisfactorily-

### CALCUTTA GARDENS.

Work in these gardens was mainly of a routine character and calls for no special comment. The display of annuals while somewhat late was up to the usual standard of excellence. A special rose garden was started and a number of fresh additions made to the permanent collections including species of *Morjnolia Cinamomum*, *Phyllanthus*, *Cassia*, *Croton* and *Dracaena*. The repair of roads in all the gardens entailed strict economy in the utilization of the grant made but the paths are now in a good state of repair and, as they are not called on to bear traffic similar to what the roads at Sibpur have to stand, they will not be making similar demands on the grant for some time to come. Out of a total allotment of Rs. 29,036, Rs. 25,829 were spent leaving the small saving of Rs. 3,207.



## LLOYD BOTANIC GARDEN, DARJEELING.

The rainfall for the year was 124 inches being about normal and its distribution was, on the whole, favourable for garden operations. Snow which fell to a depth of a foot in January in the garden area did a certain amount of damage but nothing that expert pruning could not make good. In this storm it was noticed that the *Greyilleas*, *hucalypts* and certain of the Oaks suffered most. The large number of Lonsers in the permanent collections stood the storm well and only a few other plants had branches broken under weight of the snow.

The usual routine work of the garden was carried on during the year, borne seventy-six young trees and shrubs were planted out to replace casualties or as new species to the garden. One of the steeper paths was laid with stone paving and several roads repaired. The Virator went on a collecting expedition to Sikkim during May and the Jepcha collector went as far as the Nepal frontier in quest of the annual collections of Himalayan seeds. At other times collecting work has gone on more locally.

^ T ^ O t ^ 0 3 8 Plants, 2,178 (lozeu seedlings, 245 bulbs and tubers  
ana .l.ySb packets of seeds were distributed and the usual number  
oi plants and seeds received.

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their popularity as a resort for educational or pleasureable pursuits.

nt <E^ndi? M1; Le sli? is caie the ffarden is maintaining its high standard  
oi excellence and efforts are being made to carry on in skeleton for  
the valuable collection branch which formed a special feature  
Mr. Cave s work. The full allotment for this garden was Es. 23,1.  
against a total expenditure of Rs. 23,160. The excess which was  
adjusted by the Accountant-General was due to leave allowance of  
Mr. C. C. Calder.

C. C. CALDER,

*Superintendent,*

*Loyal Botanic Garden, Calcutta.*



**Government of Bengal**

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1. **General.**—Although no record of the number of visitors to the Gardens is kept, the crowded appearance of the lawns especially on Saturday and Sunday afternoons throughout the cold weather, bore evidence that the gardens had at least maintained their popularity. It was hoped that arrangements could be made for the supply of refreshments or at least of drinking water for visitors but it has as yet not been possible to do this.

Climatic conditions were varied. The early part of the official year was extremely dry and a good many plants died. Then in May, there came a cyclone which only lasted "for five minutes, but succeeded in laying low some five hundred trees." On the morning following, trees were found scattered everywhere and, as the roads were quite impassable, the gardens had to be closed against wheeled traffic for a short time. Most of the Mahoganies (*Stictenia macrophylla*) along the Kyd and Scott Avenues, were destroyed. Some very large trees were overturned including a Rain Tree (*tinterolobiuni Sumaw*) which was indeed too big for the purchaser to remove and took the garden staff a fortnight to saw and clear away. Later there came heavy downpours which periodically converted the garden into a large lake, interspersed with a few islands. This had both good and evil effects. It improved the sanitation of the Garden but killed a number of plants including a large group of *Nipa fmiticans*. At the same time, it had the effect of disseminating seeds of weeds, specially those of *Milania scandens* which has now lost its attraction as a garden plant and become a most noxious weed. The clearing of the debris, the result of these storms, engaged the attention of the labour force for a good many months.

At the same time, however, while the clearing was systematically undertaken section by section, the opportunity was used for the pruning and cutting down of overgrown shrubs and bushes with a marked improvement in the appearance of the Gardens. Many cartloads of rubbish were removed and in addition 271 old stumps, some of enormous size which had become the breeding places of white ants, were uprooted and taken to a secluded part of the Garden.

The Economic Garden which had become a jungle of Savanah grass was reclaimed. Already a number of important economic plants have been sown and planted and it is hoped to have this part of the garden fully stocked with important economic species by the end of next year.

As the plants in the Garden are distributed geographically over some 273 acres, it has become a difficult task for the ordinary student of Botany to find representatives of the various families. To supply the needs of students, a Students' Garden has been laid out in which representatives of the different families are being arranged according to the "Flora of British India."

The flower garden was extended and the show of winter annuals was exceptionally good. Large groups of annuals in pots were ranged by the sides of the Oredoxya Avenue making a brilliant display which was admired by many.

The task of naming and labelling many of the plants in the Gardens for which the labels have either been lost or stolen is being undertaken and, when species are indigenous, the Bengali as well as the scientific names are being shown on the label, a procedure which, it is hoped, will make the labels of more general interest and so less liable to destruction.

The Palm Houses and the Orchard House showed signs of falling to pieces and were repaired with much difficulty where plants were growing over the wires. After repair the plants in the Orchard House and M'Nall's Palm House were taken up, re-arranged and replanted.

The Plant and Propagating Houses in the nurseries, which were in a dilapidated condition, were also thoroughly repaired. The stock of seedlings in the nurseries was overhauled and the watering arrangements, which left much to be desired, were improved by the construction of ten cistern\* with connecting pipes fed by a rotary hand pump which was already in stock.

The very creditable appearance of the gardens throughout the cold weather is largely due to the efforts of Mr. IN. Mitra, the acting Curator, who spared no effort to enhance the value of the gardens both scientifically and aesthetically.

The decay of the (great) Banyan Tree still proceeds and a considerable portion in the centre had to be removed to prevent the further spread of the fungus. Efforts are now being made to check the dying of the prop roots by loosening and improving the soil, but it is doubtful if the tree can be saved.

The Gardens suffered a good deal of damage during the year not only by storms but by human agency as well. For some time they were the pasture land of our neighbours. Although cattle and goats were caught and impounded, it was not until a barbed wire fence was erected on the west and north boundaries that the free accession of cattle by night was prevented. The wilful damage of labels is apparently a source of amusement to a certain section of the public while others delight in sawing and breaking up the garden benches. The stealing of flowers and plants was not restricted to any one class and with the darkness in winter this practice grew more prevalent. With a few durwans and where people can quickly leave by car or steamer the detection of offenders is not easy. By the cancelling of the steamers which call at the Warden Jetty after dark and the prompt rounding up of those who were found lingering after closing hours the amount of damage done was greatly reduced.

The condition of the roads still leaves much to be desired although a number of roads were repaired. The provision of an annual grant for this purpose is under the consideration of Government. It is regrettable that the approach from Howrah to the Gardens is not more adequately maintained.

The scheme for the housing of labour mentioned in the report of 1914 has never been brought to a completion and the present dwellings are in a deplorable condition. It is, at least, partly due to the entire absence of sanitary arrangements and to the fact that the water-supply

is such that it has been condemned as unfit for human consumption, that the sick rolls are so heavy and that outbreaks of cholera and small-pox have been frequent. Schemes for remedying these defects are under consideration and it is hoped that it will be possible to bring them to maturity in the near future.

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3. **Herbarium and Library.**—The work of the Herbarium, which has for a number of years been curtailed as the result of the combination of the appointment of the Curator of the Herbarium with that of the Systematic Assistant of the Botanical Survey of India, has received a new impetus by the appointment of Mr. K. I. Biswas to the post of Curator on the 1st February, 1927. During the greater part of the year, however, Mr. V. Narayanaswami again acted as Curator in addition to his own duties as Systematic Assistant in the Botanical Survey of India.

A considerable amount of identification work has been done during the year, more specially from December to March when the writer's collection of Chittagong plants numbering about 1,925 were received from Kew. About 1,275 plants have been identified for correspondents in different parts of the Indian Empire, so that the total number of specimens identified amounts to about 5,200. During the period under review, 1,688 plants were distributed to Universities and other institutions throughout the world. About 800 herbarium sheets have been sent on loan to correspondents in Paris, Bombay, Sweden, New Zealand and England. Some 2,600 specimens have been received from Assam, Burma, the Malaya Peninsula, the Philippine Islands, Turkestan, Japan and Washington. For these we are indebted principally to Professor H. Hayakawa, Japan, Mr. H. S. Hitchcock, Washington, Mrs. Parry Arjal, Assam; Mr. C. K. Parkinson, Burma, and to the University at Tnschkent.

The Herbarium is extending almost daily and there is practically no room for further incorporation of specimens. In fact, specimens already in the cases are being damaged due to overcrowding and a large number are lying outside. The Herbarium requires rearranging and the nomenclature must in many cases be brought up to date but the lack of space is a serious handicap. The existing Cryptogamic collections, some of which are of considerable value, are in a state of confusion and further collections have had to be refused for lack of room in which to house them. The extension of the Herbarium either by adding another storey to the present building or by erecting a separate building is urgently required. The entire lack of modern microscopes is gradually being made good.

A number of important additions have been made to the library during the year, partly by purchase, partly by gift, and I take this opportunity of thanking those authors who presented monographs or papers of Botanical interest to the Library. The Library, by failure to subscribe to important journals, many of which were received before the war but which have not been subscribed to since, is losing its usefulness and research work is badly handicapped by the absence of up-to-date literature. The library does not even contain the new edition

of englers "Die naturlicher der Pflanzen Familien" which is »  
 regular Herbarium work can be kept up to date. Efforts are being  
 made to increase the number of periodicals received by exchange whim  
 was formerly much greater than it is at present.

**4. Publications.**—Proofs have been received from Professor  
 Martelli on Asiatic Palms.

In accordance with the practice of other Botanical institutions a  
 catalogue of seeds which can be supplied by this garden has been pre-  
 pared and is being published for world-wide distribution. The Curator  
 of the Lloyd Botanic Gardens has prepared a similar list.

The Guide Book to the Gardens, the last edition of which was pub-  
 lished in 1902, has long been out of print. Numerous requests for this  
 publication are received from visitors and correspondents, and steps  
 have been taken to bring it up to date. It will be ready for reissue by  
 the middle of 1927.

**5. Finance**—Out of a total budget allotment of Rs. 57,299 for staff  
 and permanent establishment Rs. 49,709 were spent leaving a saving  
 of Rs. 7,090 mainly effected by a reduction in expenditure in the pay of  
 the post of Curator of the herbarium. The temporary establishment  
 allotment of Rs. 31,500 was practically all utilised and from Rs. 38,966  
 granted under other heads Rs. 1,022 were saved. The net saving under  
 all the heads for the year amounted to Rs. 10,613 of which Rs. 8,000  
 were surrendered to Government leaving a net saving of Rs. 2,613.  
 Revenue, being sale proceeds of surplus plants, etc., amounted to  
 Rs. 2,296.

**6. Staff**—Mr. C. C. Calder held charge up to 20th May, 1926.  
 Thereafter he went on leave for 16 months after making over charge  
 to Mr. J. K. Shaw, Government Quinologist, who acted as Superinten-  
 dent for a short period from the 21st May to 3rd July, 1926. He in  
 his turn made over charge to Mr. V. Narayanswami, Officiating Curator  
 of the Herbarium, who carried on the current duties of the Superinten-  
 dent till the 11th July, 1926. Thereafter Mr. J. M. Cowan took charge  
 on the 12th July, 1926, and held charge till the end of the year under  
 report.

Mr. V. Narayanaswami, Systematic Assistant to the Botanical Sur-  
 vey of India, officiated as Curator of the Herbarium and Librarian, in  
 addition to his own duties, till the 31st January, 1927. On the 1st  
 February, Mr. K. Biswas, M.A., was appointed to be Curator of the  
 Herbarium on probation for one year and took over charge which he  
 held till the end of the year.

Mr. W. V. North went on leave for 15 months and 16 days on the  
 3rd April, 1926. During his absence Mr. N. Mitra was transferred to  
 the Royal Botanic Gardens, Calcutta, to act as Curator. Mr. M. Jones,  
 Overseer, was promoted to officiate as Assistant Curator of the Royal  
 Botanic Gardens, and held charge throughout the year except from 3rd  
 January, 1927, to 2nd March, 1927, when he was on leave. In the  
 vacancy caused by Mr. Jones's promotion an outsider, Mr. K. S. Joneja,  
 was appointed to act as Overseer. The second overseership in the garden  
 remained vacant throughout the year. Babu Santosh Kumar Tripathi,  
 Head Clerk, was on leave preparatory to retirement. The work of some



of the senior members of the office staff leaves much to be desired, and Babu Ashutosh Bannerjee, 7th Clerk, who has officiated as Head Clerk throughout the year, is to be commended for his grasp of office routine and his intelligent handling of problems of intricacy. In spite of difficulties his work has reached a very high standard. Babu Kashi Behari Ghose and Amulya Krishna Roy have worked conscientiously and efficiently. Babu Jotindra Nath Banerjee, Shorthand typist, being found permanently unfit for further service by the Medical Board, retired on 21st March, 1927.

In the Government Gardens, Calcutta, Mr. N. Mitra, Assistant Curator, held charge for 2 days till the 2nd April, 1926. Thereafter he made over charge to Mr. S. N. Basal, who officiated till the end of the year. Mr. Quasam Ali, Overseer, was on leave on average pay from 22nd October, 1926, to 4th January, 1927.

The Lloyd Botanic Gardens, Darjeeling, were under the charge of Mr. J. K. Leslie, who officiated as Curator throughout the year.

With the exception noted the work of the staff has been satisfactory.

### CALCUTTA GARDENS.

Work in these gardens was again mainly of a routine character. The winter season annuals made a fine display; a number of new flower beds were added.

By closing the four corner gates of the Dalhousie Gardens it has been possible to partially renovate the grass lawns which had, in many places, been trodden bare by pedestrians. In the Eden Gardens the erection of numerous iron hoops over footpaths, as soon as they appeared, was to some extent effective in preserving the grass.

Waste paper baskets have now been provided in all three gardens in the hope that they will be used by the public and that the labour force can be freed for more important work than the collection of waste paper. In the Eden Gardens a number of the roads have been repaired. Fishing passes were issued for the lake in the Eden Gardens from April till October and yielded a revenue of Rs. 1,304. The work in all three Gardens has been somewhat hampered by dissatisfaction among the labour force on account of the low rate of wages. Although strikes were periodically threatened the aspect of the Gardens throughout the year was fairly satisfactory.

Out of a total allotment of Rs. 22,284, Rs. 22,168 were spent, leaving a small saving of Rs. 116.

### LLOYD BOTANIC GARDENS, DARJEELING.

The rainfall for the year was 100 inches. No snow fell but frost at night was continuous from December to February. A hailstorm at the end of March did considerable damage to bedding plants. Besides the usual routine of work of the Gardens, two roads were repaired. Ten new quarters were erected for garden servants by the Public Works Department at a cost of Rs. 4,280. The roads were repaired and painted, the nursery was re-fenced and fencing

materials were purchased to replace the boundary. The Curator went to the Jhelap, La and Changu in October. The Curator went on tours to Uantok in June and to the Singailila Range in October.

Some 2,322 plants, 8,425 seedlings, 7,900 lbs. of seeds, were distributed. Some 200 plants were received from correspondents.

Visitors to the gardens totalled 40,186. Mr. Leslie continues to maintain the high standard of the gardens and is undertaking the completion of a catalogue prepared by Mr. Cave. The total allotment for this garden was Rs. 21,908. The total saving of Rs. 1,577.

**J. M. COWAN,**  
*Superintendent (Offy.).*  
*Royal Botanic Gardens, Calcutta.*



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6. **Staff**—Mr. C. C. Calder held charge up to 20th May, 1926. Thereafter he went on leave for 16 months after making over charge to Mr. G. E. Shaw, Government Quinologist, who acted as Superintendent for a short period from the 21st May to 3rd July, 1926. He in his turn made over charge to Mr. V. Narayanswami, Officiating Curator of the Herbarium, who carried on the current duties of the Superintendent till the 11th July, 1926. Thereafter Mr. J. M. Cowan took charge on the 12th July, 1926, and held charge till the end of the year under report.

Mr. V. Narayanaswami, Systematic Assistant to the Botanical Survey of India, officiated as Curator of the Herbarium and Librarian, in addition to his own duties, till the 31st January, 1927. On the 1st February, Mr. K. P. Biswas, M.A., was appointed to be Curator of the Herbarium on probation for one year and took over charge which he held till the end of the year.

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of the senior members of the office staff leaves much to be desired, and Babu Ashutosh Bannerjee, 7th Clerk, who has officiated as Head Clerk throughout the year, is to be commended for his grasp of office routine and his intelligent handling of problems of intricacy. In spite of difficulties his work has reached a very high standard. Babus Rash Behari Ghose and Amulya Krishna Roy have worked conscientiously and efficiently. Babu Jotindra Nath\* Banerjee, Shorthand Typist, being found permanently unfit for further service by the Medical Board, retired on 21st March, 1927.

In the Government Gardens, Calcutta, Mr. N. Mitra, Assistant Curator, held charge for 2 days till the 2nd April, 1926. Thereafter he made over charge to Mr. S. N. Basu, who officiated till the end of the year. Mr. Quasani Ali, Overseer, was on leave on average pay from 2nd October, 1926, to 4th January, 1927.

The Lloyd Botanic Gardens, Darjeeling, were under the charge of Mr. J. Leslie, who officiated as Curator throughout the year.

With the exception noted the work of the staff has been satisfactory.

### CALCUTTA GARDENS.

Work in these gardens was again mainly of a routine character, the winter season annuals made a fine display; a number of new flower beds were added.

By closing the four corner gates of the Dalhousie Gardens it has been possible to partially renovate the grass lawns which had, in many places, been trodden bare by pedestrians. In the Eden Gardens the erection of numerous iron hoops over footpaths, as soon as they appeared, was to some extent effective in preserving the grass.

Waste paper baskets have now been provided in all three gardens. The hope that they will be used by the public and that the labour force can be freed for more important work than the collection of waste paper. In the Eden Gardens a number of the roads have been repaved. Fishing passes were issued for the lake in the Eden Gardens from April till October and yielded a revenue of Rs. 1304. The work in all three Gardens has been somewhat hampered by dissatisfaction among the labour force on account of the low rate of wages. Although strikes were periodically threatened the aspect of the Gardens throughout the year was fairly satisfactory.

Out of a total allotment of Rs. 22,284, Rs. 22,158 were spent, leaving a small saving of Rs. 116.

### LLOYD BOTANIC GARDENS, DARJEELING.

The rainfall for the year was 100 inches. No snow fell but frost at night was continuous from December to February. A hailstorm at the end of March did considerable damage to bedding plants. Besides the usual routine of work of the Gardens, two roads were metalled and others were repaired. Ten new quarters were erected for garden servants by the Public Works Department at a cost of Rs. 4,280. The iron gates were repaired and painted, the nursery was re-fenced and fencing

materials were purchased to replace the broken down fences of the garden boundary. The Curator went on collecting tours to Gantok in June and to the Jhelap La and Changu in September and to the Siiigailila Range in October.

Some 2,22 plants, 8,425 seedlings, 7,902 packets and 19 lbs. 2 oz. of seeds, were distributed. Some 200 plants were received from correspondents.

Visitors to the gardens totalled 40,186. Mr. Leslie continues to maintain the high standard of the gardens and is undertaking the completion of a catalogue prepared by Mr. Cave. The total allotment for this garden was Rs. 21,908. Rupees 20,000 were spent leaving a small saving of Rs. 1,577.

J. M. COWAN,  
*Superintendent (Offg.).*  
*Royal Botanic Gardens, Calcutta.*



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Government of Bengal

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# Annual Report of the Royal Botanic Gardens and the Gardens in Calcutta and of the Lloyd Botanic Gardens, Darjeeling, for 1926-27.

## ROYAL BOTANIC GARDENS.

1. **General.**—Although no record of the number of visitors to the Gardens is kept, the crowded appearance of the lawns especially on Saturday and Sunday afternoons throughout the cold weather, here evidence that the gardens had at least maintained their popularity. It was hoped that arrangements could be made for the supply of refreshments or at least of drinking water for visitors but it has as yet not been possible to do this.

Climatic conditions were varied. The early part of the official year was extremely dry and a good many plants died. Then in May, there came a cyclone which only lasted for five minutes, but succeeded in laying low some five hundred trees. On the morning following, trees were found scattered everywhere and, as the roads were quite impassable, the gardens had to be closed against wheeled traffic for a short time. Most of the Mahoganies (*Sirietenia macrophyUa*) along the JVa and Scott Avenues, were destroyed. Some very large trees were overturned including a Rain Tree (*interolobinn Samani*) which was indeed too big for the purchaser to remove and took the garden start a fortnight to saw and clear away. Later there came heavy downpours which periodically converted the garden into a large lake, interspersed with a few islands. This had both good and evil effects. It unproved the sanitation of the Garden but killed a number of plants including a laige group of *Nipa fvuith-an\**. At the same tune, it had the effect of disseminating seeds of weeds, specially those of *Md-ama scandd,\** which has now lost its attraction as a garden plant aiid become a most abnoxious weed. The clearing of the *débris*, the result of these storms, engaged the attention of the labour force for a good many months.

At the same time, however, while the clearing w a s ^ ^ " ^ ^ undertaken section by section, the opportunity was used for the junin and cutting down of overgrown shrubs and bushes with ^ a , ma ^ k e d improvement in the appearance of the Gardens. Man > eaitloads of r S l s l were removed IS in addition 271 old stumps, some, ° \* T M T M size which had become the breeding places of white ants, ue.e upiooted and taken to a secluded part of the Garden.

The Economic Garden which had become a jungle of Savanah grass was reclaimed. Already a T M ^ T M \* £ ? < ^ J & ^ been sown and planted and it fully stocked with important economic species by the end of next rains.

As the plants in the Garden are distributed geographically over some 273 acres, it has become a difficult task for the ordinary student of the various families. To supply the Garden has been laid out in which families are being arranged according to the " Flora of British India/?

The flower garden was extended and the show of winter annuals was exceptionally good. Large groups of annuals in pots were ranged by the sides of the Oredoxya Avenue making a brilliant display which was admired by many.

The task of naming and labelling many of the plants in the Gardens for which the labels have either been lost or stolen is being undertaken and, when species are indigenous, the Bengali as well as the scientific names are being shown on the label, a procedure which, it is hoped, will make the labels of more general interest and so less liable to destruction.

The Palm Houses and the Orchid House showed signs of falling to pieces and were repaired with much difficulty where plants were growing over the wires. After repair the plants in the Orchid House and Small Palm House were taken up, re-arranged and replanted.

The Plant and Propagating Houses in the nurseries, which were in a dilapidated condition, were also thoroughly repaired. The stock of seedlings in the nurseries was overhauled and the watering arrangements, which left much to be desired, were improved by the construction of ten cisterns with connecting pipes fed by a rotary hand pump which was already in stock.

The very creditable appearance of the gardens throughout the cold weather is largely due to the efforts of Mr. J.S. Mitra, the acting Uuiator, who spared no effort to enhance the value of the gardens both scientifically and aesthetically.

The decay of the Great Banyan Tree still proceeds and a considerable portion in the centre had to be removed to prevent the further spread of the fungus. Efforts are now being made to check the dying of the prop roots by loosening and improving the soil, but it is doubtful if the tree can be saved.

The Gardens suffered a good deal of damage during the year not only by storms but by human agency as well. For some time they were the pasture land of our neighbours. Although cattle and goats were caught and impounded, it was not until a barbed wire fence was erected on the west and north boundaries that the free accession of cattle by night was prevented. The wilful damage of labels is apparently a source of amusement to a certain section of the public, while others delight in sawing and breaking up the garden benches. The stealing of flowers and plants was not restricted to any one class and with the darkness in winter this practice grew more prevalent. With a few durwans and where people can quickly leave by car or steamer the detection of offenders is not easy. By the cancelling of the steamers which call at the Garden Jetty after dark and the prompt rounding up of those who were found lingering after closing hours the amount of damage done was greatly reduced.

The condition of the roads still leaves much to be desired although a number of roads were repaired. The provision of an annual grant for this purpose is under the consideration of Government. It is regrettable that the approach from Howrah to the Gardens is not more adequately maintained.

The scheme for the housing of labour mentioned in the report of 1922-23) has never been brought to a completion and the present dwellings are in a deplorable condition. It is, at least, partly due to the entire absence of sanitary arrangements and to the fact that the water-supply



\*

is such that it has been condemned as unfit for human consumption, that the sick rolls are so heavy and that outbreaks of cholera and small-Pox have been frequent. Schemes for remedying these defects are under consideration and it is hoped that it will be possible to bring them to maturity in the near future.

**Plant and seed exchange.**—During the year the Royal Botanic Gardens distributed 9,420 plants to different parts of India, Ceylon, Malaya and Baghdad. The gardens sent to Hurma, Ceylon, Africa, America, France, Cyprus and Japan 164 packets and 94 lbs. of seeds. The usual number of plants were received.

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Visitor Mr. Leslie continues to complete the standard of the gardens and is undertaking the completion of the gardens. Mr. Cave, The total height of the gardens is 15 ft.

J. M. COWAN,

*Superintendent (Offy.).*  
*Royal Botanic Gardens, Calcutta.*



**Government of Bengal**

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**For the year**

**1927-28**

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## ROYAL BOTANIC GARDENS.

**1. General.**—As the main collections of the gardens consist of trees and shrubs mostly deep-rooted, the shortage in the monsoon rainfall recorded for Bengal passed without any deleterious effect and, had the usual cold weather showers come, the light monsoon might even have been welcomed as a convenient means of keeping the undergrowth in manageable condition. But the June till September shortage, followed by a cold weather during which not a single shower fell and when even morning mists were wanting, gradually brought the garden in January and February to a state such as must have been very rare in its history. Deciduous species seemed to have an earlier than usual leaf-fall while evergreens flagged to an unhealthy degree and many of the lawns became scorched till, all grass having disappeared, they recalled the appearance of the deserts of Upper India. It is indicative of the fertility of the soil and of the rapid transformation that a water supply will effect that, with the advent of rain in March, all hands were again busily engaged at the end of the year under review in keeping the undergrowth down.

Annuals with plants established in the Palm and Orchid Houses and the herbaceous collections generally—the watering of which is a routine feature of garden work—showed no ill effects from the prolonged spell of drought.

The annuals were somewhat late but gave a welcome relief of colour to the garden once they did come into flower and were quite up to the usual standard of past years. A fresh supply of Orchids was obtained from Assam and the Darjeeling District. Apart from some species of *Dendrobium*, *Vanda*, *Phalaenopsis*, *Cypripedium* and *Cattleya*, which last and bloom for several years in the plains, fresh supplies of other Orchids require to be continually imported. These fail to survive more than a couple of years in the unnatural conditions they find here, but they make such welcome additions to the Orchid House that their re-importation is always worth while. There was a good display of Orchids at the end of the year, and the house in which they are staged is probably more frequented by the visiting public than any other plant house in the garden. Indeed, many people seem to defer visits until the Orchids come into flower.

The large Palm House was selected for special attention during the year and, while work on it is not yet completed, already it presents a much more pleasing aspect. For some time past it has been so overcrowded that the variety of its collections tended to become obscured in the mass of its vegetation. With the opening out this defect has disappeared. Variety rather than scenic effect should be the key-note of all such houses and this will determine all future additions to it.



The following additions amongst others were made to the Palm House:—

*Calamus Lindenii*, *Stevensonia grandifolia*, *Actinophloeus Sanderiana*, *Acanthophoenix crinita* and *Deckenia nobilis*.

Species planted out to permanent and requisite geographical position in the garden include *Centrum diurnum*, *Averrhoa carambola* sweet variety, *Terminalia pyrifolia*, *Terminalia natalensis*, *Acacia pseudoacacia*, *Dodonaea viscosa*, *Michelia fuscata*, *Grewia occidentalis*, *Milletia pectinata*, *Liu Kjujira*, *ureijera parviflora*, *icusia iaevigata*, *urysomma erassifolia*, *Brownea macrophylla*, *Anona cheriwillia* and *Chorisia insignis*.

Some of these merely represent the replacement of species which had died or been removed, others are new to the garden.

The loss of one of the Conifers—*Juniperus recurva*—during the year calls attention to the need for the replacement of several belonging to this group of plants. Apart from some possible members of the genera *Araucaria*, *Agathis* and *Pinus*, the Conifers cannot be said to flourish under garden conditions. They constitute a group which only just tolerates Bengal but to many visitors their unfamiliar habit forms a source of attraction, and the symmetry of their outline makes them an easy and desirable group of plants to fit schemes for the improvement of garden scenery. Attempts are being made to add to the comparatively small list falling under the group.

Attention has been called of late to the value of mahogany grown in the garden, and claims are made that the wood of this tree locally grown surpasses most other mahoganies known to commerce. Enquiries have originated with a view to conserving such supplies as may become available here for Government House purposes at Delhi.

The garden mahoganies, of which there are at least three species, must be the oldest in India. They originated from seed from the West Indies and there can be no doubt that the wood produced is of a very fine class. Doubtless there are many areas in Bengal where the true mahogany could be grown. It would form quite a useful shade tree for country road sides. It will last for well over a hundred years and if at the end of this time its wood can be prized as equal to the best in commerce, there are abundant reasons why it might now be occupying the bare and unutilized road side spaces of this province. In this connection it will be of interest to recall that the East India Company were influenced in their support to the foundation of the garden by the belief that it would prove an institution capable of determining what woods could be grown to purpose in the Indian possessions.

Although it finds its centre of distribution further to the south of the Indian peninsula, the Indian Satinwood, *Chloroxylon Sweeten-in*, is another tree that reaches considerable dimensions in the garden. It also produces a very fine wood here but its value in comparison with the Satinwood of commerce is not known.

Of the commercial value of the mahogany, *Sweetenin mnrrophylla*, first known to science from this garden, less is known. This is a much quicker growing tree and it seems unlikely that its timber would possess anything like the value of the older species.

The Students' Garden, for which part of the economic ground has been utilized and to which reference was made in last year's report,

continues a centre of attraction for all those visitors who take an interest in the botanical side of gardening. It has been begun in such a way as to allow of expansion and, while the number of species is yet limited, there is no reason why it should not develop into an area containing, named and labelled with notes of interest, many of the common plants found in the Bengal plains. With arboreal species already represented in the garden, the object should be to devote this section to herbaceous and shrubby vegetation. For the present, its expansion is limited by the necessity of maintaining an extra labour force to carry water during the dry season.

During the coming year, and now that the Orchid and Palm Houses are in a better condition, special attention will be paid to renewing and adding to the garden labels. While the cast iron label with double ground fixture now utilized for several years is an improvement on the old type in appearance, experience has shown that it fails to withstand the usage it too often becomes subjected to. Many of these labels are broken, and it is feared a reversion to the old type or a modification of it has become necessary. The disadvantage of the old type lies in the repainting of names that its usage entails, but it is less easily damaged than the modern type and considerations of utility determine a reversion to it.

Several major schemes for the improvement of the garden are under the consideration of Government. Administrative approval to the construction of new coolie quarters is anticipated and work on them will then merely await the provision of funds. A site at the back of the economic ground has been chosen for the new blocks and a tube well centrally placed will provide a safe supply of water for the coolies.

The conditions under which the labour in these gardens at present lives have given cause for much anxiety during the recent widespread epidemic of cholera. But for the presence of an energetic medical officer who induced the coolies to submit en masse to inoculation and who, in spite of objection for interference with the water-supply, had the drinking water tank treated, a spread of the epidemic to the garden would almost certainly have taken place. The few cases of cholera that did occur were promptly dealt with, but it cannot be over-emphasised that the present housing arrangements are a continual source of anxiety to those responsible for the health of the garden, and that work on the new housing scheme with its inclusive water-supply should proceed with as little delay as possible.

Reference has so often been made in past reports to the state of the garden roads that it is pleasing to note these also are scheduled for the attention they require. Here again, however, money awaits a favourable vote and while this is so, any improvement on the roads depends on the meagre savings that may be spared from garden funds proper. Nothing short of resoling and surface tarring will now give the roads the condition that modern traffic demands.

2. **Plant and seed exchange.**—Some 39,000 living plants were distributed during the year. As usual, India itself forms the main area for distribution, but small consignments for despatch abroad are always being prepared. Its geographical position in relation to America, to Europe and to West and South Africa, from all of which requests for living plants frequently arrive, makes India a difficult country from which to cater for <sup>the</sup> ~~its~~ <sup>its</sup> correspondents, for, no matter what care is

taken in packing, the long journeys with no attention en route often prove more than consignments will stand.

About the usual numbers of packets of seeds were distributed and received throughout the year.

3. **Herbarium and Library.**—The appointment of a permanent Curator of the Herbarium has allowed of arrears of work in this Department being overtaken. Routine work in acquisition, identification distribution and loan has proceeded uninterruptedly throughout the year.

Some 1,400 specimens have been distributed, including a fairly large collection of Chittagong district plants to the herbarium of the Royal Botanic Garden, Edinburgh.

Of plants received, some 1,500 have been mounted and placed in their proper positions in the cabinets.

Identifications for the herbarium or for correspondents cover a range of 1,618 specific names, but, as many species were identified in different collections and at different times, the actual number of specimens examined greatly exceeds the sixteen hundred odd.

Some two thousand specimens were loaned out during the year, the largest loan being a collection of mosses for Dr. BruhFs use in connection with his forthcoming work on the group as it occurs in South Eastern Asia. A good deal of arrear work has been overtaken in the mounting of 5,158 sheets in addition to the usual repairing of specimens already incorporated.

Besides attending to the routine of the Herbarium, the newly appointed Curator has devoted part of his time to a study of the genus *Avicennia* and to an analysis of the Algal Flora of the Chilka Lake.

Much valuable assistance in the work of the section has been given by Messrs. Narayanaswami and Srinivasan, the former of whom has brought to a stage near completion an examination of the exact geographical distribution of the collections of Wray, Kunstler and Scortechini. When finished, this work will probably be given to the Asiatic Society whose journal already contains the materials for a Flora of the Malay Peninsula to which the information in Mr. Narayanaswami's paper should, form a valuable addition.

Mr. Srinivasan, Second Assistant for systematic work, whose appointment to the department of Botanical Survey was effected during the year, was engaged generally in becoming acquainted with the range of his new duties. To gain experience in field work he was on tour towards the end of the year to the Garo Hills from which he has brought back a carefully prepared collection of some 1,000 specimens representing 250-300 species.

Dr. Cowan, who held charge as Officiating Superintendent for the first seven months of the year, completed his work on the Trees of Northern Bengal and his analysis of the Chakaria Sunderbans Flora.

A scheme for the extension of the Herbarium is under consideration and it is essential, if the continuously accumulating collections are to be properly looked after, that the additional building be undertaken at no distant date. Cabinets in excess of what are now housed, cannot be added to the present structure the capacity of which is already limited by its dimensions and lighting arrangements.

Additions to the library have been limited to serials in view of the necessity of conserving funds for the preparation of Signor Martelli's plates of Asiatic Palms. This work will be finished during 1928-29, but library funds are likely to be taxed thereafter in the preparation of plates for Sir David Prain and Mr. Burkill's monograph of the Asiatic Dioscoreas. The orders issued last year restricting the number of plates required by Signor Martelli for the illustration of the palms have been cancelled, and work on them again proceeds in accordance with the author's views of what is necessary. In the absence of special grants for work of this description, library development has to accommodate itself to the double purpose its fund serves.

4. **Publications.**—No purely garden publications apart from seed lists of the Royal Botanic Garden and the Lloyd Botanic Garden were issued during the year. Dr. Cowan's *Trees of Northern Bengal* is in the press, and reference is elsewhere made to the progress of work on the Asiatic Palms.

Besides garden publications proper, the *Flora of the Chakaria Sunderbans*, a survey publication by Dr. Cowan, appeared during the year as Volume XI, No. 2 of the Records.

5. **Finance.**—Out of a total budget allotment of Rs. 42,785 for staff and permanent establishment, Rs. 4<sup>^</sup>,593 were spent. Rupees 800 were surrendered to Government from the allotment for clerical establishment and garden staff, but this was practically balanced by an excess expenditure of Rs. 751 under "Pay of Officers—voted." The grant of Rs. 31,000 under "Temporary Establishment" was practically all used up, and, after a surrender of Rs. 5,200 from a grant of Rs. 38,720 under other heads, there was an expenditure of Rs. 32,913 and a saving of Rs. 607. After a total surrender of Rs. 6,000, there remained a small net saving of Rs. 7 on the year's budget. On the revenue side, the sale proceeds of surplus plants amounted to Rs. 494.

6. **Staff.**—The Officiating Superintendent, Dr. J. M. Cowan, held charge till the undersigned returned from leave on the 20th November to resume his former duties. Mr. K. P. Biswas, Curator of the Herbarium, was confirmed in his appointment after a year's probation on the 1st February 1928.

Mr. W. V. North, substantive holder of the post of Curator of the garden, was on long leave till the 19th July 1927 when he resigned his appointment. Mr. Mitra, who filled the leave vacancy, continued acting after Mr. North's resignation and no permanent Curator has yet been appointed. Messrs. Jones and Joneja occupied the posts of Assistant Curator and first Overseer, respectively.

The permanent Head Clerk, Babu Santosh Kumar Mitra, died while on long leave preparatory to retirement, and the officiating clerk Babu A. T. Bannerjee took charge substantively of the post from the 10th August 1927.

In the at times difficult atmosphere of unrest and discontent amongst the labour force, all subordinate members of the staff and the clerical establishment have carried on their duties tactfully and faithfully.

During the year gazetted rank was conferred on all members of the Provincial Gardeners' Service.

## CALCUTTA GARDENS.

Work in these gardens was again mainly of a routine character.

The display of cold weather annuals, a feature of gardening calling for more attention in these than at Sibpur, was quite up to the standard of past years. The proximity of a municipal water-supply system renders the attention beds require after planting out less of a drudgery here than it is at the Itoyal Botanic Garden.

Some variety to the gardens was given by the formation of new dower heels, and the colour schemes seemed to draw the attention and admiration of visitors.

A rearrangement of the North-East part of the Curzon Gardens has been decided on with a view to improving the rather desolate corner at present utilized by the Tramway Company. New plots of trees and shrubs are to be put in and it is hoped to render less obtrusive the unsightly structures that have disfigured this corner of the maidan for some years. While the condition of this corner detracts from the appearance of the Cunon Gardens it is outside the garden area proper, and the improvement is, therefore, not being carried out departmental<sup>ly</sup>.

In the Eden Garden some fifty new shrubs or trees suitable from the horticulturist's point of view were added during the year. A rockery was rebuilt near the Pagoda lake and the lake itself, which has become badly silted up was partially excavated.

Mr. Mitra acted as Curator while Mr. S. N. Basu was Assistant Curator and Mr. Quasem Ali, Overseer, throughout the year. The total <sup>all the</sup> <sup>T1 to 1,</sup> <sup>the three</sup> <sup>Calcut\*</sup> <sup>a</sup> Gardens was Rs. 23,372 of which Ks. <sup>d>i,MV</sup> were spent. Passes for fishing in the garden tanks realized <sup>Rs. 74</sup>.

## LLOYD BOTANIC GARDEN, DARJEELING.

With a mild winter during which no damage from snow or hail calls for report, and a rainfall better distributed than was the case in the plains, the year may be said to have been favourable for the garden.

A part of the road from the south gate which had sunk in places was relaid and other roads given surface repairs. Extensive repairs were executed to cold frames many of which were renewed and improved by the fixing of iron gauze as a protection against hail. Other improvements involved attention to the garden fencing, the lavatories and the Summer House.

Of seeds and bulbs received for annual plot purposes those from Europe gave good results; the Japanese supply did not do well. Fifty-four young trees and shrubs were planted out in the garden to replace casualties or as species new to the collections.

A list of seeds available from the garden or possible of collection in the district was prepared and issued to correspondents on the distribution list while the catalogue of garden plants is being revised and brought up to date.

Some 7,773 packets of seeds, 2,481 plants seedlings and 45 tubers were distributed, and 247 packets and 77 plant\*s received.

Mr. Leslie, who has held charge throughout the year, continues to **maintain the very high standard of work set by his predecessor** and that the gardens are attractive and appreciated may be inferred from the large number of visitors—42,021—willing to undertake the climb back that a visit to them entails. A special feature of the Curator's work continues to be the collection of East Himalayan plants and seeds for correspondents in India and abroad, and the writer's, thanks are due to Mr. Leslie for the energetic manner in which he has tackled this somewhat specialized duty. Extensive tours for purposes of collection were made and the requirements of botanical and horticultural institutions throughout the world as fully attended to as was possible.

There was a net saving of Us. 477, mostly effected under purchase of seeds and implements, out of a total budget, allotment of Us. 21,857.

C. C. CALDER,  
*Superintendent,*  
*Royal Botanic Gardens, Calcutta.*



**Government of Bengal**

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## ROYAL BOTANIC GARDENS.

1. General.—For horticultural operations the season just passed may be described as favourable. There was a period of prolonged drought towards the end of the year, but no permanent ill effects were visible from it, and at the time of writing this the garden is once more clothed in all its early hot weather shades of green. Death has robbed it of not a few old familiar forms and die back leaves gaunt and leafless branches on specimens one would fain think of as garden permanencies, but recent additions are springing up, and the garden is much richer so far as species is concerned than it was only a few years ago. For additions we have to thank a worldwide range of botanic gardens and institutions, but our nearest neighbours in India, Ceylon, Java and the Malay Peninsula are our best friends, and as plants native in these countries find the not dissimilar climate of Calcutta all that is necessary for their development, it is to our advantage to maintain the most intimate exchange relations with them.

No fewer than 150 species of plants unrepresented in the permanent collections in the open, in the shade houses or in the nurseries were added to the Royal Botanic Garden during the year, and a few suitable additions were made to the gardens in Calcutta from plants and seeds received in exchange by the head office at Sibpur.

As a public resort with its now well-kept lawns, its shady nooks and pleasant vistas, the garden merits the popularity its throngs of visitors prove it to have, but from the point of view of species it lags behind, if not in the excellence of individual examples, then in numbers contained and the 150 odd additions represent the year's attempt to make good this deficiency. It is extraordinary how trees and shrubs common throughout a province may in the course of time go missing from its gardens and parks, and an analysis at Sibpur shows how easy it has been to overlook plants with every claim to inclusion in the permanent lists.

Next to conserving the collections already established and rendering the garden more and more attractive from the visiting public's point of view, comes the importance of maintaining it as a repository for the largest possible number of South-east Asian species. To have these gardens in this respect twice as rich as they now are should not be difficult and is an aim constantly kept in sight. This year the most noteworthy additions belong to the palm and pine groups, the former mostly from gardens further to the South-east of Asia, the latter chiefly from Himalayan localities.

In a place the size of this expense makes it inevitable that the proportional area under annual flower beds should be small, but a very successful attempt has been made this year to add some amount of colour by the staging of flowering groups in pots at suitable vantage points throughout the area. Thus the Oreodoxa Avenue afforded a

blaze of colour to visitors entering the garden from the riverside, and the vicinity of the Orchid House and Kyd Monument similarly treated clearly proved the possibilities of this method for decorative purposes. Such cold weather grouping<sup>1</sup> of annuals involves additional nursery work, but, until the pots are ready to go out, labour on them can be restricted by maintaining the stock near a water-supply, and the final effect enhanced by the elimination of those species or individuals that fail to reach a moderate standard of excellence. Moreover, in comparison with the permanent bed, the method gains by allowing rearrangements and regrouping's of species to be carried out at any time.

Some 46 new Bojse beds, the development of which culture has been rather a feature of the garden since the present Curator took over charge, were made and planted out with stock received from Upper India. Roses do not thrive well at Sibpur but, as with Orchids, a fair show is always possible by the importation of fresh stock and by concentration on those strains most resistant to extremes of climate.

A few additions were made to the living- collections of medicinal plants and the students' section is now a well-established, and, to judge by the number of visitors who pore over it, an interesting and appreciated feature of the garden.

Amongst the more interesting- horticultural operations may be mentioned the attempted establishment of temperate fruit trees and varieties of Camelias. With the latter there is already some evidence that success may be expected, but it is too early yet to speak of the former.

A small tank, the temperature of which can be regulated, has been constructed for the propagation and hybridization of water lilies. Quite a fair stock of different varieties has been accumulated and it is hoped to work up a quantity sufficient to allow of transplantation to the garden lakes.

The work of renewing and adding to the garden labels has gone on steadily and notes are in preparation for a series of special descriptive labels to be hung on the more important species. The last attempt made at this form of garden improvement had to be abandoned on account of wilful destruction of the label covering's. On this occasion stocks of labels will be printed off and glass slides laid in with a view to the immediate replacement of destroyed covers, and continuance of the improvement will depend on how repeatedly we have to make those replacements. With the transfer of road and river bank maintenance to the Public Works Department still in abeyance no major garden improvements could be thought of.

Schemes of garden improvement which have received administrative sanction and await the voting- of funds include the provision of new coolie quarters, the sinking of a tube-well for the supply of drinking water for the public, the completion of revetment of the river bank and the thorough repair of all the garden roads.

2. **Plant and seed exchange.**—Records show some 3,360 plants as having\* been received and 26,128 distributed. As in former years the recipients were Government institutions, District Boards, Municipalities and Railways.

The reference made in last year's report to the class of Mahogany possible of culture at Sibpur resulted in an unusually large number of requests for seed or plants of this tree. As the seed does not keep

well it had all been distributed before these requests arrived, and the best that could be done was to register applicants for a supply when fresh consignments could be received from the West Indies. These consignments continue to arrive yearly and make up for the deficiency in locally produced seed. The poorer grade of Mahogany fruits abundantly in Bengal but not the better kind.

Something<sup>1</sup> under 500 packets of seeds were received from foreign correspondents and 422 distributed to various gardens, scientific departments and private individuals throughout the world.

3. **Herbarium and Library.**—The usual numbers of specimens were received, identified and incorporated and with the Herbarium and Survey staff now at its full sanctioned strength, a definite beginning has again been made to depute officers for periods of regular field survey work. Mr. Narayanaswami, First Assistant in the Survey, has brought back a large collection from a little known region north of the Kalar river in Travaneore. Mr. Biswas, Curator of the Herbarium, has had several short tours in the Salt Lakes, 24-Parganas, Bengal, and Mr. Srinivasan will return to the Garo Hills for further survey and ecological work at an early date. The materials from these areas are at present being worked out and already promise new or rare plants or the extension of the hitherto supposed geographical limits of plants known elsewhere in the Peninsula.

In connection with the identity of seed collected for distribution from the Eastern Himalaya, considerable numbers of plants were examined for Mr. Leslie, Curator of the Lloyd Botanic Garden, IWjeeling.

In addition to the collections made departmentally accessions to the Herbarium include some 1,000 sheets returned after revision for the Flora of Madras, and a somewhat smaller number of Forestian duplicates from the Eoyal Botanic Garden, Edinburgh. Accompanying the latter was a large number of Nepal specimens including representatives of the genus *Primula* on which so much work has been done at Edinburgh of recent years. The gift is a welcome addition to Herbarium. During his Cinchona tours in Burma, the writer took occasion to add to the collections from the New Mergui Reserve area by bringing back some 350 specimens.

Besides South Indian material to Kew specimens on loan include all the material of the genus *Gnetum* to Prof. Markgraf of Berlin, the genus *Nyssa* to Mr. R. N. Parker and the genus *Cbngaea* for taxonomic research at Peradeniya. The Sorghums also have gone to Kew, partly on loan for revision and partly to be retained on exchange account.

In common with other departments, the Library started receiving its supplies of books through local firms. Apart from periodicals, a very limited number of books only was purchased, library funds being diverted as far as possible to financing the plates for the forthcoming volume on the Asiatic Palms.

4. **Publications.**—No purely garden publications appeared during the year but final printing orders have issued for the Trees of Northern Bengal, and all the plates of Asiatic Palms in charge of Prof. Martelli have now been prepared and paid for. The letter press of this work, which is in its last proof, will be ready for the plates as soon as they arrive in India. The way is, therefore, now clear for the next Annals

monograph-Sir David Train and Mr. Burkill's work on the Asiatic  
Dioscor. The estimate for the plates part of this work given by  
Messrs Spottiswoode Ballantyne & Co. has been accepted. Of Survey  
publications under Dr. Cowan's Ecological account of the Forests of Kalim-  
SL- distribution and next awaiting the Records is Dr. Bruhl's

volubinous census of Indian Mosses.  
allotment of Rs. 51,349 for  
Rs. 50,116-7 were spent. Rupees  
were surrendered under clerical establishment and garden staff  
and there was a saving of Rs. 32. Under all other heads  
there was a net saving of Rs. 720-6-11 out of a total grant of Rs. 65,214  
under the heading "Veiling allowance and house rent and other  
expenses" of Rs. 52-15-11, the  
excess of Rs. 8- was accounted for by the difficulty of  
Uden's stores. From the sale of miscellaneous  
garden products Rs. 933-3 were received and paid into the treasury.

Superintendent. Mr. Biswas  
Mr. Mitra, Curator, and Mr. Jones,  
These two officers were confirmed  
from the 19th July 1927.  
Overseer with effect from the  
tosh Banerji was Head Clerk throughout  
and the clerical establishment have  
performed their duties satisfactorily.

**CALCUTTA GARDENS.**

The work in the Gardens was again mainly of a routine character,  
and was up to its usual standard of excel-  
lence. Such of the plants such as feras and  
multiplied for decorative purposes and for loan to outside public or  
semi-public institutions.

Certain grants received special attention but at best the  
and are only ordinary surface repairs  
necessary. A more serious question of resins to  
bring them back to India.

The project of tanks is a large and expensive scheme  
become. When tanks sil up till they  
the bottom becomes heat in an occasional  
S...ion of emptying and deepening them. For many years  
both these and the Royal Botanic Gardens at Sibpur have been living  
on capital so far as the value of their tanks is concerned. Complaint  
has been received of late that the boating facilities in the Eden Garden  
for

allowed by silting to get into quagmire conditions, are as unhealthy  
as they are unsightly, and that public health interests too are involved  
in further capital expenditure on them. involve

Mr. Basu was, under the Curator, officer in immediate charge and  
Mr. Quasem Ali, his assistant, Overseer throughout the year.  
of a total allotment of Rs. 24,209, there was a saving of Rs. 301.

effected mostly under Europe stores. Rupees 138 were obtained in the Dalhousie Square Section by the issue of fishing" passes and paid into the treasury.

### LLOYD BOTANIC GARDEN, DARJEELING.

The season in Darjeeling varied little from normal. Rainfall records show 91.27 inches. There was no snow but frost was continuous at nights during the winter. In March 1929, there were two heavy falls of hail which did some destruction to the annuals in the flower beds and damaged outside plants. Garden roads were all given surface repairs and improvements to the durwans' shelters, the propagating\* house and its staging' and the lower lake made. All the glass houses were repainted and fine mesh wire-netting- obtained through the stores department to protect the glass from hail.

Seeds of annuals obtained from Messrs. Carter and Co. and Watkins and Simpson gave good results as did also bulbs received from Holland. One hundred and seventy young trees and shrubs were planted out in the garden to replace deaths and as new species.

Mr. Leslie, who has been in charge throughout the year, continues in a very efficient manner the special seed and plant collection work through which his predecessor in office had given the garden a world-wide reputation. The collection work has suffered somewhat this year due to audit objections to the pay of the plant collectors and seed house boy. In consequence of these objections we have lost trained services difficult of replacement. Nevertheless the following seeds and plants were distributed to botanical and other institutions during the year: seeds 871 packets, plants 750; seedlings 2,200, and 517 packets of seeds and 521 plants were received. According to the gatekeepers' registers 39,261 persons visited the garden during the year.

Out of a sanctioned allotment of Rs. 21,719 for all heads, Rs. 21,112-12-2 were spent. A decision not to enter the market against local firms dealing *in* plants was reached during the year and there was no garden revenue.

C. C. OALDER,

*Superintendent,*

*Royal Botanic Gardens, Calcutta.*



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Next to conserving the collections already established and rendering the garden more and more attractive from the visiting public's point of view, comes the importance of maintaining it as a repository for the largest possible number of South-east Asian species. To have these gardens in this respect twice as rich as they now are should not be difficult, and is an aim constantly kept in sight. This year the most noteworthy additions belong to the palm and pine groups, the former mostly from gardens further to the South-east of Asia, the latter chiefly from Himalayan localities.

In a place the size of this expense makes it inevitable that the proportional area under annual flowerbeds should be small, but a very successful attempt has been made this year to add some amount of colour by the staging of flowering groups in pots at suitable vantage points throughout the area. Thus the *Oreodoxa* Avenue afforded a

blaze of colour to visitors entering\* the garden from the riverside; and the vicinity of the Orchid House and Kyd Monument similarly treated clearly proved the possibilities of this method for decorative purposes. Such cold weather grouping of annuals involves additional nursery work, but, until the pots are ready to go out, labour on them can be restricted by maintaining the stock near a water-supply, and the final effect enhanced by the elimination of those species or individuals that fail to reach a moderate standard of excellence. Moreover, in comparison with the permanent bed, the method gains by allowing\* rearrangements and regroupings of species to be carried out at any time.

Some 46 new Rose beds, the development of which culture has been rather a feature of the garden since the present Curator took over charge, were made and planted out with stock received from Upper India. Roses do not thrive well at Sibpur but, as with Orchids, a fair show is always possible by the importation of fresh stock and by concentration on those strains most resistant to extremes of climate.

A few additions were made to the living collections of medicinal plants and the students' section is now a well-established, and, to judge by the number of visitors who pore over it, an interesting and appreciated feature of the garden.

Amongst the more interesting horticultural operations may be mentioned the attempted establishment of temperate fruit trees and varieties of Camelias. With the latter there is already some evidence that success may be expected, but it is too early yet to speak of *the* former.

A small tank, the temperature of which can be regulated, has been constructed for the propagation and hybridization of water lilies. Quite a fair stock of different varieties has been accumulated and it is hoped to work up a quantity sufficient to allow of transplantation to the garden lakes.

\* The work of renewing and adding to the garden labels has gone on steadily and notes are in preparation for a series of special descriptive labels to be hung on the more important species. The last attempt made at this form of garden improvement had to be abandoned on account of wilful destruction of the label coverings. On this occasion stocks of labels will be printed off and glass slides laid in with a view to the immediate replacement of destroyed covers, and continuance of the improvement will depend on how repeatedly we have to make those replacements. With the transfer of road and river bank maintenance to the Public Works Department still in abeyance, no major garden improvements could be thought of.

Schemes of garden improvement which have received administrative sanction and await the voting of funds include the provision of new coolie quarters, the sinking of a tube-well for the supply of drinking water for the public, the completion of revetment of the river bank and the thorough repair of all the garden roads.

2. **Plant and seed exchange.**—Records show some 3,360 plants as having been received and 26,128 distributed. As in former years the recipients were Government institutions, District Boards, Municipalities and Railways.

The reference made in last year's report to the class of Mahogany possible of culture at Sibpur resulted in an unusually large number of requests for seed or plants of this tree. As the seed does not keep

well it had all been distributed before these requests arrived, and the best that could be done was to register applicants for a supply when fresh consignments could be received from the West Indies. These consignments continue to arrive yearly and make up for the deficiency in locally produced seed. The poorer grade of Mahogany fruits abundantly in Bengal but not the better kind.

Something' under 500 packets of seeds were received from foreign correspondents and 422 distributed to various gardens, scientific departments and private individuals throughout the world.

3. **Herbarium and Library.**—The usual numbers of specimens were received, identified and incorporated and with the Herbarium and Survey staff now at its full sanctioned strength, a definite beginning has again been made to depute officers for periods of regular field survey work. Mr. Narayanaswami, First Assistant in the Survey, has brought back a large collection from a little known region north of the Kalar river in Travancore. Mr. Biswas, Curator of the Herbarium, has had several short tours in the Salt Lakes, 24-Parganas, Jhansal, and Mr. Srinivasan will return to the Garo Hills for further survey and ecological work at an early date. The materials from these areas are at present being worked out and already promise new or rare plants or the extension of the hitherto supposed geographical limits of plants known elsewhere in the Peninsula.

In connection with the identity of seed collected for distribution from the Eastern Himalaya, considerable numbers of plants were examined for Mr. Leslie, Curator of the Lloyd Botanic Garden, Darjeeling.

In addition to the collections made departmental<sup>^</sup> accessions to the Herbarium include some 1,000 sheets returned after revision for the Flora of Madras and a somewhat smaller number of forestian duplicates from the Royal Botanic Garden, Edinburgh. Accompanying the latter was a large number of Nepal specimens including representatives of the genus *Primula* on which so much work has been done at Edinburgh of recent years. The gift is a welcome addition to Herbarium. During his Cinchona tours in Burma, the writer took occasion to add to the collections from the New Mergui Reserve and by bringing<sup>1</sup> back some 350 specimens.

Besides South Indian material to Kew specimens on loan include all the material of the genus *Gnetum* to Prof. Markgraf of Berlin, the genus *Nyssa* to Mr. R. N. Parker and the genus *Congea* for taxonomic research at Peradeniya. The Sorghums also have gone to Kew, Partly on loan for revision and partly to be retained on exchange account.

In common with other departments, the Library started receiving its supplies of books through local firms. Apart from periodicals, a very limited number of books only was purchased, library funds being diverted as far as possible to financing the plates for the forthcoming volume on the Asiatic Palms.

4. **Publications.**—No purely garden publications appeared during the year but final printing orders have issued for the Trees of Northern Bengal, and all the plates of Asiatic Palms in charge of Prof. Martelli We now been prepared and paid for. The letter press of this work, which is in its last proof, will be ready for the plates as soon as they arrive in India. The way is, therefore, now clear for the next Annals

monograph—Sir David Prain and Mr. Burkill's work on the Asiatic Dioscoreas. The estimate for the plates part of this work given by Messrs. Npottiswoode Ballantyne & Co. has been accepted. Of Survey publications, Di- Cowan's Ecological account of the Forests of Kalimpong is under distribution and next awaiting the Records is Dr. Bruhl's voluminous census of Indian Mosses.

Finance—Out of a total budget allotment of Rs. 51,349 for staff and permanent establishment Rs. 50,116-7 were spent. Rupees 720 were spent on clerical establishment and garden staff. It was a small figure having Rs. 32-9. Under all other heads there was a saving of Rs. 720-6-11 out of a total grant of Rs. 65,214 after a surplus of Rs. 11,000-0-0. Allowance and house rent and other major items of Rs. 753-15-11, the expenditure on the sale of miscellaneous garden products Rs. 933-1-3 were received and paid into the treasury.

6. Superintendent. Mr. Biswas was appointed as Superintendent. Mr. Biswas Assistant Superintendent, Mr. Mitla, Cuiat, Mr. Jones, Mr. Tolli, Mr. ... The two officers were confirmed with effect from the 19th July 1927. Post of Overseer with effect from the 28th July 1927. Mr. ... was Head Clerk throughout the period and the clerical establishment have performed their duties satisfactorily.

**CALCUTTA GARDENS.**

Work in these gardens was again mainly of a routine character. Annuals was up to its usual standard of excellence. The purpose and for the public of ...

Certain areas of roadway received special attention but at best the grants made for the gardens all of only ordinary surface repairs and an insufficient amount of the heavier expenditure that becomes necessary for the more serious operation, of resoling to bring them back to condition.

The proper excavation of the tanks is a large and expensive scheme which has become longer. When tanks silt up till they become shallow enough for certain weeds to develop on the bottom, the expense of their clearing becomes heavier than the occasional deepening them. For many years on the Sh. ... Gardens at Sibpur have been concerned. Complaints are made of the facilities in the Eden Garden. This is the need for tanks which are in unhealthy conditions, are as unhealthy in further capital expenditure on them. interests too are involved

Mr. ... his assistant, Overseer throughout the war. Out of a total allotment of Rs. 24,209, there was a saving of Rs. 301,

effected mostly under Europe stores. Rupees 138 were obtained in the Dalhousie Square Section by the issue of fishing" passes and paid into the treasury.

### LLOYD BOTANIC GARDEN, DARJEELING.

The season in Darjeeling varied little from normal. Rainfall records show 91\*27 inches. There was no snow but frost was continuous at nights during the winter. In March 1929, there were two heavy falls of hail which did some destruction to the annuals in the flower beds and damaged outside plants. Garden roads were all given surface repairs and improvements to the durwans' shelters, the propagating-house and its staging- and the lower lake made. All the glass houses were repainted and fine mesh wire-netting obtained through the stores department to protect the glass from hail.

Seeds of annuals obtained from Messrs. Carter and Oo. and Watkins and Simpson gave good results as did also bulbs received from Holland, one hundred and seventy young trees and shrubs were planted out in the garden to replace deaths and as new species.

Mr. Leslie, who has been in charge throughout the year, continues in a very efficient manner the special seed and plant collection work through which his predecessor in office had given the garden a world-wide reputation. The collection work has suffered somewhat this year due to audit objections to the pay of the plant collectors and seed house boy. In consequence of these objections we have lost trained services difficult of replacement. Nevertheless the following seeds and plants were distributed to botanical and other institutions during the year: seeds 871 packets, plants 750; seedlings 2,200, and 517 packets of seeds and 521 plants were received. According to the gatekeepers' registers 39,261 persons visited the garden during the year.

Out of a sanctioned allotment of Rs. 21,719 for all heads, Rs. 21,112-12-2 were spent. A decision not to enter the market against local firms dealing in plants was reached during the year and there was no garden revenue.

O. O. OALDER,  
*Superintendent,*  
*Royal Botanic Gardens, Calcutta.*



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# Annual Report of the Royal Botanic Gardens and the Gardens in Calcutta and of the Lloyd Botanic Garden, Darjeeling, for 1929-30.

## ROYAL BOTANIC GARDENS.

**1. General.**—One can never start to give an account of the year's progress without being conscious of the disadvantages, so far as the public is concerned, of the unfortunate remoteness of these gardens from Calcutta, and of the increasing difficulty of access to them that the commercial development of Howrah as a goods terminus brings in its train.

The year has seen the garden thronged with its thousands of visitors, but a large proportion of these are here for a day as members of picnic and other parties, and there is a comparative absence of the casual visitor for an hour or so, the class of visitor to whom the beauties of a garden are a daily rather than a once a year attraction. It will, perhaps, not be otherwise until improvement trusts reach out in their efforts to make the suburbs more easily approached by present roads, or until new modes of access came as a result of more general development. One would fain look forward to missing Howrah altogether in a journey from Calcutta, and developments of the year, in which these gardens are specially interested as the intended terminus of a tunnel under construction, give some reason for the hope that new approaches in the form of river subways may yet solve the problem of access between East and West banks.

Until it is solved the efforts of those responsible for the attractiveness of the place must be expended for that restricted public intent on reaching the beauties of the gardens through all the unpleasantness of their approach.

Climatic conditions have not hindered the garden staff in their efforts. The rains were somewhat prolonged, and as a result there was late sowing with late flowering of cold weather annuals. But the plans for garden maintenance and development have been diligently followed, and there is a goodly number of new and interesting species added, with all previous efforts at the show of annuals completely eclipsed. The temporary staging of animals in pots throughout the garden has been greatly developed since reference to its advantages were made in last year's report. This is perhaps the outstanding feature of the year. It has involved additional expenditure and labour, but the results achieved, especially in the direction of giving colour to foregrounds and relieving the drab appearance of shades of green, have established as a permanency this method of garden improvement.

In addition to this the area of the permanent flower garden has been increased by beds of roses and other flowering perennials and by new plots for annuals, especially in the neighbourhood of the smaller

palm house. Elsewhere throughout the garden the addition of beds of Cannas on islands and at the end of vistas has greatly helped the general scheme by giving some colour and life to the whole.

Noteworthy amongst the 220 additions to permanent situations, of which some 58 are species new to the garden may be mentioned, *Cupressus sempervirens*, *Cupressus viacrocarpa*, *Betula utilis* and *Corylus ferox* from the Lloyd Botanic Garden, *Arenga*, *Ormosia dasycarpa*, *Samadera indica*, *Pentadesma hutyracea*, *Clitrysantha*, *Schizolobium excelsum* and *Eugenia punyensis* from Ceylon, *Mallotus nepalensis*, *Rhodospaera rhodanthema* and *Aberia inacrocalyx* from Dehra Dun, *Domheya acutangula* and other species through the services of the Agri-horticultural Society and two species of economy importance, *Elettaria Cardamomum* and *Eugenia caryophyllata* from Buitenzorg.

Several plants now introduced to permanent situations have been tried repeatedly before without much success, but a fresh chance through new situations and altered methods of treatment is always being offered to old failures in the hope that one or two successes may justify retrials. The Curator's sanguine efforts in this direction have been amply justified so far as new annuals go, and those visitors who were privileged to see through the nurseries not open to the general public met not a few old European cold loving favourites seldom seen in India. This was especially the case with bulbous plants and, in any exhibit stood out as a surprise in the heat of Bengal, this was exemplified in pots of well grown Narcissus.

There was the normal show of Orchids at the beginning and end of the year, in which species of *Dendrobium*, *Vanda*, *Catasetum*, *Laelia* and *Cattleya*, as usual, were prominent. For the public these plants seem always to hold a particular interest. The beauty of their forms and the variety and profusion of flower they display, perhaps, makes this interest natural, and it is fortunate that the most profuse of flower and amongst the most attractive should also be the most easy to handle horticulturally. No group in these gardens surpasses in beauty the *Dendrobiums*, the most hardy and easily handled of all. But a real Orchid display requires the hand of the specialist. Many species succeed only with difficulty in the plains of Bengal and the importation of fresh stock is a yearly necessity.

Garden officers and the clerical establishment are enjoying for the first time the benefits of the electric scheme now completed for fans and lights, and gratitude to Government for this provision is all the deeper from long experience of being without these modern conveniences. The improvement benefits local officers and staff and was long overdue, but other schemes of Garden improvement are even more urgent from the public point of view. Among the most longed for is a supply of drinking water to the visiting public. The absence of such a supply, which in these times of tube-wells could be had for a sum small in comparison with what would be required to take down Corporation water, is undoubtedly a serious drawback. It militates against garden popularity and keeps away many parties who would otherwise enjoy coming here. No scheme of Garden improvement and it is suggested not many schemes in any department of Government would gain the public support and draw the gratitude that the provision of drinking water here would elicit. Until such reasonable public demand is met, it must be the duty of officers responsible for

garden amenities to keep the scheme prominently to the front with a view to its gaining its proper place in the order of schemes sanctioned but awaiting funds.

2. **Plant and seed exchange.**—Records show some 1,260 plants as having been received and 20,947 distributed. In the main, receipts and distributions are Indian, but numbers have been received from and have also gone abroad. As usual, -Government institutions, District Boards, Municipalities and Railways are the chief recipients.

Some 305 packets and 37 lbs. of seed were received from foreign correspondents and 481 packets and 97 lbs. were distributed. The garden does not regularly publish seed lists for exchange purposes, but its services are always at the disposal of local and foreign correspondents and for purposes of obtaining seed and botanical material these services, already sufficiently advertised by historical connections, are freely utilised by a worldwide range of institutions.

3. **Herbarium and Library.**—The usual numbers of specimens were received, identified and incorporated. Prominent amongst receipts were collections from Forest Officers in Burma and a set of representative plants of the Eastern Himalayas for determination and preparation for the Herbarium of the University of Vienna.

Several thousands of specimens have been acquired for the Herbarium during the year, and the attempt to settle down to regular annual field survey work has been continued.

Mr. Biswas, the Curator, was on tour in the Bombay Presidency early in the year and towards the close started work for a survey of the South Burma Cinchona Reserve area. Collections have accrued from this area for several years, but it is proposed to systematise the collection and survey by having an officer on the spot for periods representing all seasons of the year. This is Mr. Biswas' first tour but it will be followed as circumstances permit by regular periods of deputation so that material representing all seasons, areas and altitudes may be built up. Mr. Srinivasan, Senior Assistant in the Survey, has continued work in the Garo hills area, adding to his materials already rich and to his field observations with a view, ultimately, to an Ecological account of the vegetation of this part of the Indian Empire.

Prominent amongst accessions from outside were gifts of well-preserved specimens from the Swedish State Museum, Stockholm, and from the National Museum, Washington, and a set of named grasses from Professor Hitchcock of the Smithsonian Institute, Washington.

The chief distribution, so far as number of plants goes, was a set of 927 Eastern Himalaya, Chittagong and Madras duplicates to the Department of Tropical Forest Botany, University of Oxford.

Many specimens are on loan. The Juneaceie have been to Stockholm, - the Gnetace® to Berlin and the Southern India CypeiaceiB to Kew in connection with the Flora of Madras. These will be followed at an early date by the Grammes. To Kew, also, by way of loan in the first instance, but possibly for permanent incorporation with the African collections there, has gone a set of

South African plants collected by Dr. Eoxburgh early last century. The collection is of historical interest and is more appropriately housed at Kew with other African collections than at Sibpur.

General Herbarium routine work has been actively continued. Some 1,300 odd old covers have been replaced, 3,245 specimens have been incorporated, unknown but large numbers of sheets have been repaired and remounted, poisoning of the collections goes on regularly and the general appearance of the cabinets themselves has gained much by their being repolished and varnished.

Apart from adding periodicals, the supply of which received under standing orders cannot safely be interfered with, little could be done to enrich the Library collections. Of the grants voted for books and plates much has to be revived for the costly illustrations that accompany issues of the Annals of the Garden, and it would be to the Library's advantage if the financial requirements for plates could be separated from Library grants proper.

4. **Publications.**—Of Garden publications, Volume 13 of Annals, being Professor Martelli's Asiatic Palm, *Coryphe*, has reached its final stage in the printer's hands. Some delay in the progress of this work has been caused of late by the author's illness. The plates work of Volume 14—Sir David Prain and M. J. Hill's monograph of the Asiatic Dioscoreas—is under way. Mr. J. Hill, Curator of the Herbarium, has investigated and reported on the Algal flora of the Calcutta Water Works. Mr. J. Hill has also been invited to collaborate with Professor Dixon in descriptions of new or noteworthy Himalayan Mosses and has in an advanced state a paper descriptive of his already extensive work on this group of plants in the North-West of India. Professor Brihl's Census of Indian Mosses, to be published in the Records, has been received from the Press and is under correction.

5. **Finance.**—Out of a total budget allotment of Rs. 51,901 for staff and permanent establishment, Rs. 48,837-13 were Rupees 3,000 were surrendered, mainly under Garden staff, due to change of incumbents and to a post of Overseer being kept vacant, there was a small final saving of Rs. 63-3. Under all other heads there was a net saving of Rs. 519-5-5 out of a net grant of Rs. 72,155 after a surrender of Rs. 1,092 under "Allowances, honoraria—non-voted. The total net saving was Rs. 582-8, accounted for mainly by difficulty in exactly estimating expenditure for Europe stores.

Rupees 2,308-12-6 were realised and credited to Government from the sale of miscellaneous garden produce. This sum is much in excess of the average and estimated receipts. The rise is due to the sale of some valuable wind-blown Mahogany.

6. **Staff.**—The writer held charge as Superintendent, Mr. Biswas was Curator of the Herbarium, Mr. N. Mitra, Curator of the Garden, Mr. M. Jones was Assistant Curator till 25th January 1930 when he was transferred to the Calcutta Gardens to relieve Mr. Basu transferred to Darjeeling. Mr. Joneja was Overseer at Sibpur throughout the year. Mr. Quasam Ali was Overseer in the Calcutta Gardens till Mr. Jones' transfer when he came to Sibpur to officiate as Assistant Curator. Babu Ashutosh Banerjee was Head Clerk throughout the year. With minor exceptions, all subordinate officers and the clerical establishment have been loyal in the performance of their duties.

## CALCUTTA GARDENS.

"Work in these gardens was again mainly of a routine character. After losing its crowds of visitors, who seem to have transferred their attention of an evening to the vicinity of the Victoria Memorial, the Eden Gardens would seem to be regaining part of their past popularity. This is no doubt due to the thoughtfulness of His Excellency in allowing his band to resume the musical programmes formerly held here. These are much appreciated and help to bring back to the gardens the appearance of life and liveliness they once possessed. This added attraction has been accompanied by efforts to render the garden itself in the vicinity of the bandstand more of a beauty spot for the visiting public. As at Sibpur the staging out of potted annuals has been resorted to, and the structure of the bandstand itself has lent itself to the scheme. Considerable improvement has been made in the condition of some of the roads, the maintenance of which now becomes an annual as against a former quadrennial charge.

Not many people know of the existence of the Orchid, fern and palm displays at the north-west corner of the garden but there is a growing collection of valuable plants in the kutchas that serve as houses for these groups, and one scheme of Garden improvement could usefully and popularly take the form of a large airy cool house similar to those used for shade-loving plants in the Royal Botanic Gardens at Sibpur. With the deferment of arrangements to deepen the tanks in the gardens repeated cleaning of their weeds was carried out. This has become an unsatisfactory and wasteful process in Garden conservancy, but it is obligatory if the tanks are to remain at all in keeping with garden surroundings.

In the Dalhousie Square Gardens no outstanding work calls for report, but those—and they are many—who pass on their way to business daily must have noticed and enjoyed, if they had any love for nature's beauty left, the unusually fine display of cold weather annuals in the Curzon Gardens. Actually these gardens have a position that much more should be made of. Were provision ample the area could be one mass of flower and colour all the year round. The position it occupies and its shape, a comparatively narrow strip between two main highways, are just what are required to make the best of a floral display. For a garden it would be hard to better its natural advantages, but flowers take labour and attention, and failing the liberal provision that would be required to open and maintain the beds the next best scheme would provide more ample shade throughout the area. The casual observer will note how bare of shade are these gardens. It is a little difficult to understand why this should be so, except that they are not old, and that, possibly, the idea of one immense flower garden was in the mind of their designer.

Up till 25th January 1930, Mr. Basu was Assistant Curator. On this date he proceeded to Darjeeling to prepare for his duties of acting Curator there. He was replaced by Mr. Jones who officiated till the end of the year. Out of a total allotment for the Calcutta Gardens of Rs. 24,232, there was a small saving of Rs. 268-1 mostly effected in cost of foreign stores and other charges pertaining thereto. Fishing passes for Dalhousie Square tank brought in a revenue of Rs. 72.

## LLOYD BOTANIC GARDEN, DARJEELING.

At this station the season was favourable for gardening! Rains were well distributed, there was no snow and temperatures were normal.

A part of the roof of the western propagating house was renewed and also the centre and one side staging. A new cold frame was built of improved design to replace an old frame which had fallen to pieces. The roofs of godowns and carpenters' shed, garden shelters and lavatories were repaired and repainted. A length of 350 feet of road was relaid and other roads were given surface repairs.

Good results were again obtained from seeds of annuals received from Carter and Company, and Watkins and Simpson. Japanese bulbs were not so successful as the bulbs from Holland, due principally to the longer journey from Japan through a tropical climate which started the bulbs into growth before their arrival in Darjeeling.

Three hundred and ninety-three young trees and shrubs were planted out in the garden to replace deaths and as new species.

It may be of interest from the economic point of view to note, that, of the seeds imported in 1927 Nos. 17, 18 and 19, being seeds of raspberries and loganberries received from Tasmania have developed strong plants, which have borne fruits freely, of better flavour and size than the ordinary local raspberry. A few of these plants have been distributed to North Sikkim where conditions for temperate fruits are very much better than in the Darjeeling district.

The Curator toured in the Tista Valley for 8 days in December and the plant and seed collectors went on a tour which occupied six weeks to the Jongri plains and the Gyachela for collecting seeds of alpinists. At other times of the year seed and plant collecting was done in the neighbourhood of Darjeeling, the Rungeet and Tista Valleys.

The following seeds and plants were distributed to botanical and other institutions during the year, seeds 4,142 packets, plants 1 seedling 2,646 and bulbs and tubers 361, and the following number of seeds and plants were received, seeds 270 packets and plants 0.

Mr. Leslie who was in charge except for the last few days of the year when he proceeded on leave, has made praiseworthy efforts to maintain the reputation of the garden as a centre for the distribution of Eastern Himalaya plants and seeds.

Out of a sanctioned allotment of Rs. 25,366 for all heads, Rs. 21,675-8-2 were spent. There was a compulsory saving of Rs. 3,360 under cost of passages, due to the late submission of bills by a Steamship Company.

C. C. CALDER,  
*Superintendent,*  
*Royal Botanic Garden, Calcutta.*



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## ROYAL BOTANIC GARDEN.

1. General.—Amongst the general public who discuss the prospects of a visit to these gardens, the question of their approach is always one of first consideration. *No* one who is dependent on a motor car for coming—and this section of the visiting public grows in numerical importance every year—will think of starting out without first making the necessary enquiry as to the state of the roads. Their condition is a matter of public interest and for general information, therefore, it may be mentioned that the riverside road through Howrah to the gardens has been greatly improved of late and that, apart from the unpleasantness of having to negotiate an ever-increasing volume of traffic, the ease and comfort of access dependent so much now-a-days on road surface is noticeably better than it was even as late as a year and half ago.

A policy of steady repairs—the stitch in time method—seems responsible for this, and whether or not the betterment of roads is responsible there has been a marked increase in the number of visitors reaching the garden by bus and car. Praiseworthy attempts to maintain and improve the main roadways have been made and it is a pity, therefore, that obstacles to using them freely should exist. Riverways access is, of course, always the more pleasant, but in view of the ever-growing bus and car traffic and the possibility of the ferry service being restricted, it is a matter of extreme importance to these gardens and, indeed, to all interests west of the Bengal-Nagpur Railway that free passage should prevail over this Company's line systems converging on Shalimar.

It is more pleasant, perhaps, to get on to congenial surroundings and discuss the garden itself. Both in the nurseries and flower beds, in the plant houses and in the open, there is a year's steady progress to report. Climatic conditions were normal and at no time of the year had special measures to be taken to help out the ordinary horticultural work. Rainfall recorded for the year was about the usual, its distribution was good and this with an absence of cyclonic storms combined to make the year a favourable one for all horticultural operations. The permanent tree and shrub collections in the open were enriched by numerous additions and long-established specimens have not been spared in an effort to make the gardens more attractive. Perhaps the scientific officer is too apt to think of the contents of a garden as botanical specimens and to concern himself with the presence and arrangement of these rather than with their form and beauty. A break with tradition is, therefore, not necessarily disadvantageous to methods—and it may be invigorating and refreshing—to have for a time on the staff an officer whose experience brings ideas of big scale tree pruning and surgery. Mr. Fothergill, the newly appointed officer in charge,

was assiduous in his endeavours, by judicious pruning and lopping, to restore the appearance of old time plants that had grown away from their natural stateliness and beauty and by larger scale operations to give a chance of fresh life to dying and diseased specimens.

The desirability of making the garden richer as a living repository of the more beautiful and useful tropical and semi-tropical trees and shrubs is always in mind, and the following additions of plants new to the collections show what has been accomplished to this end during the year. Of new trees there have been added *Alphonsea lutea*, *Erythrina acanthocarpa* and *Blackii*, *Prosopis velutina*, and *Melaleuca crassifolia*. Of shrubs, *Cordia liolstii*, *Hibiscus Abelmoschus*, *Anona microcarpa*, *Erythrina tomentosa* and *indica*, *Parkuisonia microphylla*, *Lantana crocea*, *Psidium Fricdrichsthaliaiiuvi*, *Bauhinia Krugii*, *Millettia dura*, *Bambusa quadrangularis*, *Ptelea trifoliata*, *Pandanus Sandei*, *Costus discolor*, *Fatsia papyrifera* and *Cassia artemisioides*. Of creepers, *Lonicera Leschenaultii*, *Passiflora pruinosa*, *Cissus Lindeni*, *Cissus albonitens*, *Boussingaultia basclloides*, *Bougainvillaea spectabilis*, varieties: *Fraser* and *Cypheri*. In some cases single numbers of these only have been available, but in most cases three or four specimens have been planted and in a few there has been material for groups. Experience has shown that not all planted out have succeeded but, as explained in previous reports, repetitions of those that fail will be made from the nurseries where an ever-increasing variety is being developed by the accession of seeds and plants from India and abroad.

The nurseries are now much richer than at any time in the previous experience of the writer and, although the additions planted out to permanent situations are too small to catch the eye, and insignificant as yet as producers of scenic and group effects, they are yet plentiful enough to make certain in future of a much richer and more interesting botanical garden.

It is unfortunate that the display of cold weather annuals seldom coincides with the New Year period. They are never at their best till later, but this year's display, while possibly not surpassing former years in mass production, has been easily the best seen here in respect of individual specimens. As in the past few years they have been staged at the more frequented and open spots of the garden and have been much admired not only by the general public but by the trained horticulturist. This is a visitor whose eye looks critically and who usually has never yet been known to admit his own results as inferior or to lack experience or knowledge of something better. His approbation is, therefore, sought. This year it was as freely given as it was deserved. In order that the gardens may look more attractive during the Christmas and New Year Week, the period when they are most frequented, arrangements have been suggested for a display of bulbous plants to take the place of the annual stagings before the usual supply of potted flowers is ready. The idea is worth following up for the development of bulbous plants is less at the mercy of weather conditions and many of this class lend themselves to forcing methods. In addition to potted annuals staged in groups throughout the garden, the usual area of flower beds was maintained. Minor rearrangements of beds were made in the main flower garden and a new herbaceous border, containing amongst others some beautiful varieties of *Gladiolus*, was opened round the smaller palm house.

The Orchid house was as usual a source of great attraction during the first two warm months of the year. The display was normal and calls for no special mention. Species of *Vanda*, *Cabasetum*, *Cattleya* and especially *Vendrohium* comprised the bulk of the display. The rarer kinds of Orchids, of which the gardens possess a few fine specimens, are not risked in the houses open to the public, and this for reasons that will suggest themselves to all. But these and also a fine collection of ferns and *Cacti* under glass can always be visited by special arrangement.

Needless to say none of the garden schemes sanctioned and awaiting funds could be proceeded with during a year financially so difficult as that just passed. Garden labour has, perforce, to remain in its insanitary hovels and make do. Neither the river bank nor the roads, the care of which was decided some years ago as an unsuitable charge for garden officers, has yet gone over to departments of Government specialising in these works. This leaves them a charge on garden funds proper, and, as both take not a little upkeep, it has been impossible to do anything in the way of other large scale garden improvement. Mr. Fothergill has made praiseworthy attempts to keep the lake edges and surfaces in a sanitary condition and a few of the main roads have had specialised asphalt treatment, but in respect of roads, river bank and tanks the gardens are living on capital value and the best that can be done in the present conditions of financial stringency is to distribute the funds available over all works according to immediate necessity and to stave off the condition of garden deterioration that looms ahead. This is the policy followed. It is unsatisfactory from every point of view and especially is it uneconomical as allowing only patchwork where thorough repair is needed, but it appeals in present conditions as most in tune with the spirit of co-operation and it is preferable to the alternative of letting ruin overtake certain works destined for other departments.

Mechanical innovations cannot be said to appeal to the local popular imagination and the institution during the year of a motor tractor with grass cutting machines has drawn the usual resentment as a disturbance of old time methods. But the tractor has come to stay, for it is cheaper, quicker and more effective than the grasscutter and scytheman and makes conservancy easier for a staff now hard put to it to maintain the garden as it formerly was.

From the visiting public's point of view the most urgent scheme is that for the provision of drinking water. Funds for this were allotted but had to be withdrawn on account of the prevailing financial condition. The completion of this simple and inexpensive scheme would, possibly, do more for the popularity of these gardens than any other measure. Visitors complain of the drawback all the time and in the hot weather, it will be understood, complaints are not lacking in pointedness. One would like to think of public spiritedness extending in this direction. The giving of water has come down through all history and in all lands as an action bespeaking goodwill, beneficence and charity. Even the dumb animals are not forgotten in this respect. Here at the Royal Botanic Garden the most long suffering animal is man. He it is who suffers and who would bless a public benefactor.

2. **Plant and seed exchange.**—Records show some 284 plants received and 14,524 sent out. As usual Government institutions, District Boards, Municipalities and Railways are the chief recipients!

The garden took its share in staging materials for the annual show at Alipore held under the auspices of the Agri-Horticultural Society. The display of *Dahlias*, in particular, attracted attention and a miniature flower garden set up apart from competitive exhibits, was also much admired.

Besides two casks of mahogany seed received from Kew, 47lbs. and 286 packets of seed were distributed while 215 packets were received, mainly from institutions abroad. For the information of botanical and horticultural institutions throughout the world it may be mentioned that the common practice of issuing exchange seed lists is not regularly followed by the Royal Botanic Garden, but its services are freely at the disposal of such institutions and all are invited to communicate when the question is one of obtaining Indian material.

3. **Herbarium and Library.**—Routine work on acquisition, identification, distribution and loan has proceeded uninterruptedly throughout the year. Prominent amongst distributed lots are 611 specimens of Himalayan plants to Austria, 692 Malayan duplicates to Washington and some 1,765 sheets to Dr. Cowan at Edinburgh. For acquisitions our thanks are chiefly due to the Director, Botanic Gardens, Singapore, for 286 duplicate specimens of South-East Asian plant; to the Mycologist in charge, Natal Herbarium, Botanic Gardens, Durban, South Africa, for 100 duplicates; to the Systematic Botanist, Coimbatore, for 243 duplicates; to the Acting Keeper of the Edinburgh Botanic Garden for 137 sheets; and to the National Museum, Washington, for 46 duplicates of New World plants.

Specimens of South Indian plants have as usual been on loan to Kew in connection with the continuation of the "Flora of Madras." To Kew has also gone on loan small numbers of old sheets of *Psychotria* and *Ixora* to help clearing up difficulties on the systematic position of certain little known members of these genera. For a forthcoming work on the genus *Trapa* all our material of this aquatic has gone to Dr. Glick of Heidelberg as also certain fresh material to aid in the same study. About 1,500 sheets have been incorporated during the year and 1,115 genus or species covers renewed. Repair, mounting and poisoning work have been carried on as usual.

To Mr. Kanjilal has gone, at different times, quite a number of authenticated species to aid him in his work on the "Flora of Assam." Mr. Kanjilal has spent a good deal of time at work on his material in the herbarium and Mr. Parkinson spent some weeks on collections from Burma that had remained unplaced or the identifications of which were for various reasons still considered tentative. The short time at his disposal prevented an examination of all the material, but enough was done to indicate the presence of new or interesting species. In addition to his work Mr. Parkinson gave much appreciated help in the identification of garden Bamboos. Mr. D. Datta of the Indian Agricultural Service visited the herbarium for some time towards the end of the year in connection with his enquiry into the grasslands of Bengal. His visit resulted in arrangements for collaboration with the Curator of the Herbarium and together these officers have a paper on this subject under preparation. These visits for botanical work are mentioned as types of which Sibpur could wish more.

Several survey tours were undertaken during the year. Of survey officers, Mr. S. N. Bal toured with Mr. Biswas in the Bikrampur area of East Bengal, in the Naga Hills and in Manipur and much material

accrued to the herbarium as a consequence. Mr. Srinivasan continued exploration in the Garo Hills and brought some 2,000 sheets containing some 500 species. His interest in and ability as a photographer is being directed towards photographically recording, both whole and in dissections, some of the more interesting garden plants. The most junior officer, Mr. Badhwar, has spent nearly the whole year on tour in the North-West. His work is mainly economic, being an enquiry into the possibilities of the North-West as a source of Santonin, but his botanical interests are wide and the herbarium is likely to be considerably the richer by reason of his general collections. Towards the end of the year the Curator of the Herbarium was deputed to continue botanical exploration of the Burma Cinchona Reserve area, a survey that is yielding much material and that will be continued as funds and staffing arrangements permit.

To the office and herbarium staff was entrusted the work of distributing a fairly large quantity of seed of *Aleurites Fordii* received from Kew at the close of the year. India shows some promise of being a suitable home for the Tung Oil Plant and this distribution was part of an effort to demonstrate the local possibilities of this oil industry. Tea gardens of Assam, especially, are interested in this importation.

The routine work of the library has been going on as usual, but accessions have been greatly restricted by the fact that library funds have to finance departmental publications as well as do library work proper. In view of the sums required for the publication of the Annals, all that could be done for the library was to maintain a restricted supply of the most necessary botanical periodicals. Some 50 copies of Dr. Cowan's "Trees of Northern Bengal" have been distributed from the library during the year.

4. **Publications.**—Of garden publications, Volume XIII of the Annals, being Professor Martelli's Asiatic Palms, Coryphese, has passed through the Press. With the issue of this volume a halt is called for a time at least in this, the greatest work ever attempted on the palms. The next volume will be Sir David Prain and Mr. Burkill's monograph of the genus *Dioscorea* and by the end of the year the bulk of the plates for the first half of this work had already been prepared.

Of the records, Dr. Brühl's "Census of Indian Mosses" has appeared. It is a valuable compilation on the group in which is brought together together of the information that has been accumulated by previous workers, as well as much that is the result of the personal observation of the author. It will be an incentive to young Indian botanists to tread in this and other engaging fields of Botanical study.

5. **Finance.**—Out of a total budget allotment of Rs. 50,279 for staff and permanent establishment, Rs. 50,223 were spent and under all other heads there was a net saving of Rs. 431 out of a net grant of Rs. 65,049. As a measure of retrenchment necessitated by the prevailing financial difficulty, a sum of Rs. 5,493 had to be surrendered to Government. Receipts of the department during the year amounted to Rs. 670-13-3.

G. **Staff.**—The writer held charge as Superintendent and Mr. Biswas was Curator of the Herbarium throughout the year. Up till the end of July Mr. N. Mitra was Curator of the Garden. Thereafter, he proceeded on 28 months' combined study and other leave. The

continuance of his work as Curator till the end of the year was provided for by bringing in a trained horticulturist, Mr. Fothergill, from the Cinchona Branch of the service. Maulavi Quasem Ali officiated as Assistant Curator throughout the year and Mr. Joneja very ably filled the post of Overseer. The clerical establishment headed by Babu Ashutosh Banerjee, in his customary, forceful and thorough manner, worked loyally and well. With minor exceptions, subordinate officers and all the clerical establishment have been loyal.

### CALCUTTA GARDENS.

Efforts were made to improve the standard of excellence of flowering annuals exhibited in different parts of the Gardens. Some fifty different species of plants were introduced and stocks of ferns and potted palms and orchids were rearranged in the nursery. Several newly laid out beds not only increased the decorative effect but prevented the public from making unsightly short tracts and thereby spoiling the beauty of the lawns of the gardens. The arrangement of shifting refuse and other material in motor lorry resulted in greater facility of transport. Difficulties of keeping the Eden Garden tanks in sanitary condition have temporarily been overcome by leasing out the tanks for pisciculture. Under this arrangement the lessee has to keep the tanks clean and to pay a sum of Rs. 200 annually, and this is an item of importance so far as garden expenditure is concerned.

Funds provided for the repair of the garden roads were withdrawn and this will entail a reversion to the old practice of a large expenditure over four years or so. This, unfortunately, is more expensive as well as less satisfactory in the long run.

**Finance.**—Out of a sanctioned allotment of Rs. 23,059, there was a small saving of Rs. 89. A total revenue of Rs. 313 obtained in the Dalhousie Square section by issuing fishing passes and by leasing out tanks of the Eden Gardens was paid into the Treasury.

**Staff.**—Mr. M. Jones, officer in immediate charge under the Curator, creditably held the post of Assistant Curator, Government Gardens, throughout the year, and Mr. Gholam Mohiuddin<sup>was</sup> temporary Overseer from the 22nd April 1930 till the end of the year.

### LLOYD BOTANIC GARDEN, DARJEELING.

A few inches less rainfall than the normal and a hailstorm did not affect the general condition of the plants of the garden. Considerable success has been attained by Mr. S. N. Basu, the Curator, in his attempt to increase the esthetic and horticultural value of the garden by laying out more than a hundred artistic beds, and by keeping the roads, garden houses, lawns and tanks tidy. Suitable sitting accommodation under the shades of the trees have also been provided for the public. Many new varieties of annuals have been grown this year for exhibition. To replace the old stock of the garden some varieties of *M. W.*<sup>u^</sup> *Azaleas*, (*amcllias* and (*Uierviea* have been imported from Japan. In a horticultural experiment the Curator has been successful in propagating some of the rare species of the garden, such as *Larix Gñjithii* and



*Meconopsis grandis*. If the latter can be fruited this garden may be in a position to meet the demand, for the seeds of this species, of many of the gardens. The garden has been enriched by planting about 547 young trees and shrubs. About 7,703 seeds, 2,228 plants, 120 bulbs and 8,141 seedlings have been distributed to the different botanical, horticultural and other institutions of the world. Seeds of *Meconopsis grandis* collected this year have been supplied to the Director, Royal Botanic Garden, Kew; Regius Keeper, Royal Botanic Garden, Edinburgh; the Keeper of Royal Botanic Gardens, Glasnevin, Dublin, and Sir Reginald Spence. Collection of Alpine seeds has been made from Jongri plains and Gyache La and the garden thus maintains its tradition as an important centre for the distribution of Alpine plants.

Seeds and plants, for His Majesty's Royal Park, under the orders of His Excellency the Governor of Bengal, were also collected in Bhutan. The success of the collection was largely due to the willing help given by Raja S. T. Dorji, the British Agent in Bhutan. Some of the plants collected are being grown in baskets and are being prepared for the onward journey. As desired by His Excellency 115 packets of seeds collected chiefly in Bhutan and in the Alpine Himalayas of Sikkim, have been handed over to the Private Secretary to His Excellency the Governor for His Majesty's Royal Park.

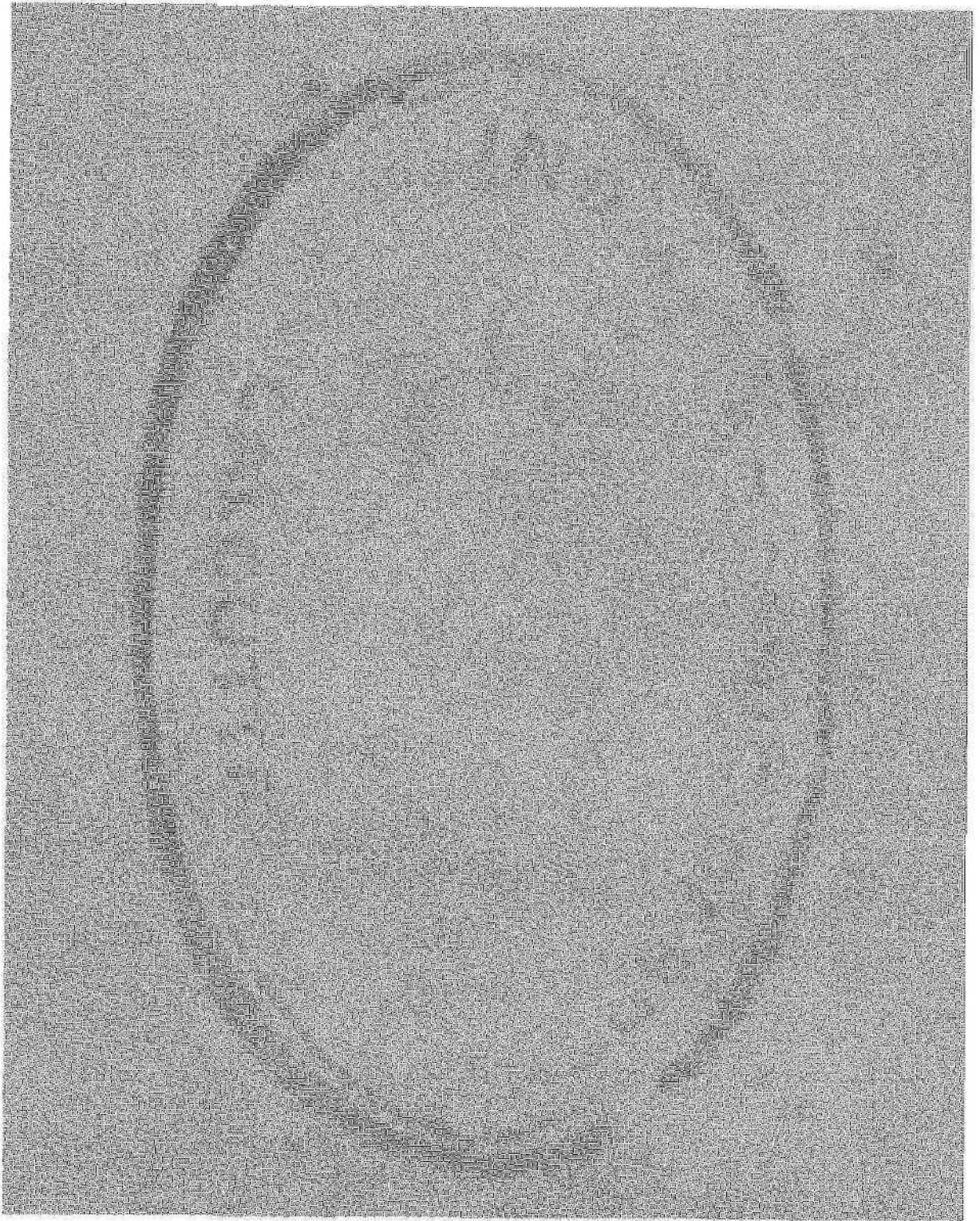
About 44,000 visitors paid visits to the garden and the garden thus holds its time-honoured reputation for botanical interest and popularity as a public resort.

**Finance.**—Out of a total allotment of Rs. 19,078 under all heads Rs. 19,039 were spent leaving a small balance of Rs. 39 as savings.

**Staff.**—Mr. S. N. Basu held charge of the post of Curator till the 30th March 1931. Thereafter, Mr. J. E. Leslie, the permanent incumbent of the post, returned from leave and took over charge on the 31st March 1931.

C. C. CALDER,

*Superintendent, Royal Botanic Garden, Calcutta.*



**INDIAN BOTANIC GARDEN LIBRARY**  
**BOTANICAL SURVEY OF INDIA**