TRINIDAD.

COUNCIL PAPER.

No. 48.] [1891.

ANNUAL REPORT ON THE ROYAL BOTANIC GARDENS, 1890.

Section I.—INTRODUCTION.

I have the honour to submit my Fourth Annual Report on the Botanical Department. The period under review is from January to December, 1890.

The previous Reports on the working of the Department have been so well received by the local Public, by Colonial and Foreign Correspondents and by visitors of all classes, that there is the strongest encouragement to continue them on the same lines as during past years, and although the amount of clerical work which it entails is very large—still the work is justified by the end attained, which is the dissemination of knowledge concerning the Island of Trinidad and her agricultural resources.

The Report for 1889 was distributed as usual free of charge to all correspondents, Local, Colonial, and Foreign; a copy was presented to Hotels and to each vessel of the West Indian Squadron of the Royal Mail Steamship Company, both Ocean and Intercolonial, and I am credibly informed they have been the means—more than once—of bringing to the Island visitors who would not otherwise have come to Trinidad.

The Sections and sub-heads are again retained, as it is felt that the sequence or history of work and progress is thus continued in a more legitimate manner than would be possible if other arrangements were adopted. It is of course difficult to prevent such records from becoming monotonous, but this difficulty, like all others, is to be met and overcome, and I trust my endeavour in that direction in the following pages will not be wholly in vain.

I have to thank the Press for their favourable comments on last year's work, and especially the leading Jamaica Papers, for their highly complimentary remarks on the 1889 report. A press in sympathy with well meant efforts, can do an incalculable amount of good, and I am always anxious to secure their assistance in spreading information so important to the progress of West Indian Agri-Horticultural industries.

As a specimen of the opinion on the work of the Royal Botanic Gardens of Trinidad, I quote from the Italian Newspaper "Pro Patria." Speaking of the 1889 Report, Count Bosari, writes—"This fine work published in Trinidad deserves imitation by all the trans-oceanic colonies of the States of Europe."

Section II.—ESTABLISHMENT.

The Officers of the Establishment are the same as last year. The Superintendent was away on a short visit to the Islands of Grenada and St. Vincent on privileged leave for a period of 13 days, having been asked by Sir Walter Hely-Hutchinson, K.C.M.G., the Governor-in-Chief of the Windward Islands, to inspect and report upon the works now being carried on at the Botanical Stations of the two Islands. He was also away from the Gardens on a journey by the Island Coasting Steamer to the various ports of call in Trinidad and Tobago, being absent 4 days.

Mr. Broadway, Assistant Superintendent, was absent on leave during the whole of the month of January, and in August and September was away on sick leave for a period of 36 days.

As reported last year the work of the Department has been again such as to need all the efforts of the Staff to cope with it, and in cases of sickness or during periods of absence on leave of either Officer, those remaining have of necessity double duties to perform in consequence of no junior officer being at hand who could temporarily undertake the duties.

Under these circumstances I asked His Excellency the Governor for further assistance. Though strongly recommended by His Excellency and by the Home authorities the Finance Committee of the Legislative Council did not see fit to provide for the same, but I trust that another [illegible] the necessary means may be allowed, for with the present Staff I am unable to d[illegible]much as should be done to further the various scientific subjects which are da[illegible]rought to my notice, the

National Oceanic and Atmospheric Administration

Climate Database Modernization Program

ERRATA NOTICE

One or more conditions of the original document may affect the quality of the image, such as:

Discolored pages
Faded or light ink
Binding intrudes into the text

This document has been imaged through the NOAA Climate Database Modernization Program. To view the original document, please contact the NOAA Central Library in Silver Spring, MD at (301) 713-2607 x124 or www.reference@nodc.noaa.gov.

LASON
Imaging Subcontractor
12200 Kiln Court
Beltsville, MD 20704-1387
March 28, 2002

practical work of compiling a good set of the Island Flora is much delayed, and the operations of the Garden itself cannot be conducted with the regularity and precision which is their due, for the want of sufficient supervision.

Section III.—METEOROLOGY.

The number of Stations from which a Return of Rainfall is regularly received has been increased from 79 in 1889 to 97 in 1890—including a few newly established stations in the Island of Tobago.

It is shewn by the Records of Temperature, that the neighbouring Island is slightly hotter than Trinidad although the records are taken at an elevation some 175 feet higher. The elevation of the Tobago observatory is 305 feet and that at the Royal Botanic Gardens is 130 feet above sea level.

The observations at Chaguanas Depôt shew a temperature 1°·2 lower than those taken at the Royal Botanic Gardens. All the instruments have been tested by a standard thermometer supplied by Messrs. Negretti and Zambra of London.

It is to be regretted that more stations of observation for temperature are not available, as such would probably effectually dispose of the generally received but I think erroneous idea that Trinidad is the hottest part of the West Indies.

It was shewn in last year's Report that this idea was incorrect so far as Jamaica was concerned, although we are much nearer the equator than that Island and the cause which gives Trinidad such moderate and equable tropical temperatures is probably to be found in the fact of its proximity to the cool mountain ranges of the neighbouring mainland.

My thanks are due to the various observers who send in returns for publication, but I take this opportunity to give them a gentle reminder that I should be able to considerably improve the service, were they to adopt the system of sending in their Returns at the earliest possible moment after the completion of each month. Each observer has been supplied during the year with a bound record book for entering observations, and a copy of the monthly Returns as soon as published. This work entailed the sending out locally of 1,164 returns by post, and the receipt and compilation of a similar number. Besides these, exchanges are made with English, Colonial, and Foreign Observatories. The remarks made in my last Report on the influence of *temperature* and *humidity* upon plant life have called forth corroborative evidence from several competent observers. It becomes yearly more patent that HUMIDITY is a much more important factor in influencing the growth of plants than either SOIL, MANURES, TEMPERATURE or ATMOSPHERIC PRESSURE. In many instances the two latter may be disregarded to a great degree, humidity NEVER.

To Dr. Tulloch, the Observer at Scarborough, Tobago, I am again under obligation for a complete series of carefully calculated Meteorological observations for the year, and I have also to thank the Jamaica Meteorological Office for their returns.

The correspondence with the Meteorological Office in London has been regularly maintained.

I append tables shewing the returns for the Royal Botanic Gardens for 1890. It will be seen that the rainfall for the year 1890 at the Royal Botanic Gardens is more than the average by 17·41 inches, and has only been exceeded during the past 29 years by the falls for 1865 which reached 85·28 inches, and that for 1886, 86·82 inches. A table shewing the results for Tobago is this year included.—(See Appendix III.)

Section IV.—HERBARIUM.

Slow but steady progress has been made in the Herbarium during the year. The general collection has received large additions, but only a few specimens have been procured from the distant districts of the Island, it being almost impossible with the present staff to carry on explorations into the interior. This is much to be regretted, seeing the large amount of interest which is now being taken in Botanical exploration, and with regard to Trinidad especially the field is so encouraging from the fact of its being as yet, only partially explored. In Grenada and St. Vincent collectors have been maintained, supported by the British Association, and by private gentlemen connected with the centres of English Botanical Science. In Trinidad, however, there is absolutely no interest taken in Botanical exploration, except by the few interested travellers who annually reach our shores. After a good deal of enquiry into the matter I cannot find that one single collector or collection is to be found in the Island, excepting at the Royal Botanic Gardens. That such apathy should exist is deplorable in land deriving its income almost entirely from agricultural pursuits and thus in a great measure dependent upon botanical discovery to furnish it with new industries.

From botanists in America and in other parts of the world come many enquiries for seeds and plants and botanical specimens of the Flora of Trinidad, shewing that great interest is taken in it by outsiders, although neglected by its own people.

An addition of 500 sheets has been made to our collection of Porto Rico plants by the arrival of a second well-named set from the Royal Botanical Museum of Berlin. That institution has set itself the task of working up to date the West Indian Flora, and we are endeavouring on our part to assist them in the good work by sending such specimens of our Flora as can be procured. Among the latter have been found several novelties of considerable interest. Among the specimens in the old Crugerian Herbarium was found one labelled *Pouteria sp.*, and to which is attached the name of Sylvester Devenish, Esq., M.A., as collector. To this specimen Professor Pierre of Paris attaches considerable importance, but from the years that have elapsed it is difficult to find the original locality where the species originated, and to procure fresh material for modern investigation.

The usual annual consignment of Herbarium sheets have been sent to Kew to be identified in the Herbarium of that Establishment, but up to the end of the year they have not been returned, the pressure of work being as usual very great, I am however informed that they are nearly completed and doubtless they will shortly be received.*

The drying and mounting of local specimens have been proceeded with, and some 1500 sheets have been added to the general collection, principally consisting of Garden plants collected during the year. The number of Orders represented in the Herbarium following the Genera Plantarum was, for last year 121. This has been increased during the year to 136 out of the 200 of the aforementioned work.

While on a journey to St. Vincent in August 1890 I discovered a form of AGAVE RIGIDA, *Mill.*, previously unknown to West Indian Floras. It produces a useful fibre, but appears to be too short in the leaf to rival the variety known as AGAVE RIGIDA VAR. SISALANA of *Perrine*. The same species has also since been found in Barbados and identified with the above. With nothing is it more easy to make a mistake than the various species of Agave, and special care should be taken by growers for economical purposes to have their plant identified by competent persons, before expending large sums on cultivation. As an instance I may mention that the *Coratoe* of Jamaica was for long years popularly supposed to be no other than the Tropical American AGAVE AMERICANA, until an examination was made into its characteristics by Mr. D. Morris when that gentleman was resident in Jamaica. The same thing occurred in Trinidad. The Langue Boeuf of the Bocas Islands was for many years supposed to be AGAVE VIVAPARA, *Linn*, but a plant sent to Kew from these Gardens proves it to be the Mexican AGAVE POLYACANTHA, *Haw*. A plant from St. Lucia recently received shows characteristic points differing from any of the above, though popularly supposed to be identical with our Bocas Island plant, and it may be found that several unknown Agaves exist in the West Indies that have been passed over by botanists from their similarity of growth to the commonly known forms of the larger islands and mainland.

An interesting discussion took place in the columns of local newspapers during the year as to the nomenclature of plants, popularly known as "Cousin Mahoe." These plants take the name of "Cousin" from their producing *glochidiate acheniums, carpids* or burs, and their second name of "Mahoe" from the fact of their producing fibrous bark, "Cousin Mahoes" therefore, and "Mahoes" are found under the genera *Urena, Triumfetta, Malachra, Abutilon, Paritium, Sterculia*, and many others. Plants of the genera Urena and Triumfetta are in common use as remedies for Chronic Dyspepsia and other diseases in Trinidad and on the mainland, and are recommended for use by some of our most respected medical practitioners; the plant, however, which seems to meet with the most general approval and the one that is generally recommended for the purpose is URENA SINUATA, *Linnæus*, which is synonymous with U. PARADOXA, *Kth.* and U. SWARTZII, *Mocf.* It is reputed to have a special action upon the liver. It was formerly thought that these virtues were to be attributed to TRIUMFETTA SEMITRILOBA, L., but this has been found to be erroneous, although that plant, as well as other Triumfettas, is without doubt also used by many persons for the same purpose.

Residents and visitors to the Island interested in Botanical Science are invited to inspect the resources of the Herbarium of the Royal Botanic Gardens. It can be seen daily, (Saturday afternoons, Sundays and public holidays excepted,) and every information will be afforded by the Superintendent as to its ordinary working, and also on points of special interest.

---

* Received March, 1890.

Section V.—CORRESPONDENCE.

From January 1st to December 31st, 1890—1664 letters, were sent out. This was 125 less than during 1889, but still, an average of over five letters for each working day of the year.

Numerous contributions from the pen of the Superintendent have been furnished to the pages of the "Agricultural Record," the official organ of the Central Agricultural Board. This periodical is published in a handy form and furnishes, as its name indicates, a plain record of Agri-Horticultural progress during the year. It is published once a month at the Government Printing Office, and can be obtained at the low rate of 6d. per copy of 45 to 60 pages, pamphlet form.

The correspondence with the mother establishment (Royal Gardens Kew) and with Colonial and Foreign Botanical and Scientific establishments has been duly continued, and much valuable information has been obtained thereby, the gist of which is given in the annual Report or elsewhere when ripe for publication.

Section VI.—DECORATIVE WORK.

The work in this Section has been carried out in regular course as during past years.

At all kinds of public entertainments such as balls, bazaars, concerts, performances of different kinds, and private parties, decorative plants are in great demand, and have been supplied from the Royal Botanic Gardens—free of charge—to applicants a small deposit only, being required to cover any damage to plants, pots, or tubs, &c.

The transit of the plants for an average distance of one mile to the place of entertainment by carts and waggons, has necessarily the effect of not improving their condition, the tender mercies of a town-carter to decorative plants being better imagined than described. In consequence, the hardiest plants have to be selected for this special purpose, and even these cannot be expected to present the same appearance as specimens in villa gardens which are seldom or ever touched, except by the hand of the cultivator. The decorations of the residence of His Excellency the Governor have been continued in the usual manner, it being sought to introduce as much variety as possible by the cultivation of plants suitable for the purpose.

I append the Rules and Regulations for the sale and distribution of Plants for public information :—

BOTANICAL DEPARTMENT, TRINIDAD.

RULES AND REGULATIONS FOR THE DISTRIBUTION AND LOAN OF PLANTS, &c.

In order to facilitate the distribution of plants from the Royal Botanic Gardens, the following information is supplied for the information of persons making applications :—

1. Applicants can obtain estimates personally or by letter as to the cost of plants, packing &c., &c., the amount of which MUST BE REMITTED TO THE SUPERINTENDENT PREVIOUS TO DELIVERY OF THE PLANTS.

2. Remittances by post should be sent addressed "Superintendent Botanic Gardens"—and in order to prevent disappointment it is desirable that plants should be removed as soon as possible after allotment. When not removed within fourteen days, the allotment will be considered cancelled.

3. It is to be understood that the Department does not undertake the delivery of plants, and will not be responsible for them after they leave the Gardens. Its officers however are willing for the convenience of the Public to make arrangements for packing and delivery to Boat or Rail on receipt of the estimated amount, *but at the risk and cost of the purchaser.*

4. To Public Institutions and to persons endeavouring to promote the "Subsidiary Industries," advice in connection with the various cultivations is freely afforded by the Superintendent either by letter or interview. The latter can be arranged by appointment for the mornings of Mondays and Thursdays, which are set apart for that purpose.

5. *In cases where it is deemed desirable to carry out experimental planting the Government will in future sanction the grant of plants at a low rate or free of cost, at the discretion of the Superintendent.*

6. Exchange of plants between the Gardens and private cultivators who may possess rare or unique specimens is especially invited, but new or rare plants will not in future be supplied until a sufficient stock of plants have been raised to supply all applicants on equal terms.

7. Committees desirous of obtaining decorative plants on loan for use at Public Entertainments are informed that application must be made in writing on Forms obtainable at the Gardens at least three clear days beforehand. That they must provide their own transit, and that a sum sufficient to cover all damages to pots or plants and for the pay of the Garden hand who has the care of the plants while they are away from the Gardens, must be lodged with the Superintendent previous to the plants leaving the Gardens. All applications should state number and size of plants required and for what length of time.

8. Planters desiring large numbers of plants of such products as Cocos, Coffee, Coca, Oranges, &c., in bamboos or from open ground, or any other kind of plant *in quantity* can only, as a rule, obtain supplies by giving six months notice previous to the date they will be required, it being found too expensive to keep on hand large supplies for casual demands.

9. The Gardens are open to the public every day, Sundays included, and the Nurseries for the sale of plants during office hours from 8 a.m., to 4 p.m., except on Saturdays when the office closes at 1 p.m. Special appointments for the accommodation of purchasers may be arranged if application is made in writing to the office of the Superintendent. To residents desirous of introducing transient visitors every possible facility will be afforded on application.

Pending the issue of a complete Catalogue and Price List, the following is a General List of Plants on Sale:—

Mandarin, Tangerine, and Sweet Oranges—in Bamboo pots	4 cts. each.
Mandarin, Tangerine, and Sweet Oranges—from open ground	2 ,, ,,
Grenadine Orange	20 ,, ,,
Shaddock or Citron	5 ,, ,,
Limes	4 ,, ,,
Casuarina stricta—Whistling Oak	12 ,, ,,
Biota orientalis—Arbor Vitæ	20 ,, ,,
Petrea erecta	12 ,, ,,
Guaiacum officinalis—Lignum vitæ	10 ,, ,,
Anona muricata—Sour Sop	8 ,, ,,
Averrhoe carambola	10 ,, ,,
Mangos (Seedling) $1 per doz., or	10 ,, ,,
Mangos (Grafted)	1 dol. ,,
Castilloa elastica (Rubber—Central American)	10 cts. ,,
Ficus elastica (Rubber—East Indian)	25 ,, ,,
Hevea Braziliensis (Rubber Para)	12 ,, ,,
Jambosa malaccensis "Pomme Malac"	5 ,, ,,
Achras sapota—Sapodilla	10 ,, ,,
Red Guava, Litchee, or Star Apple	8 ,, ,,
Clove	12 ,, ,,
Coffee	1 ,, ,,
Balata and Poui	5 ,, ,,
Kola Nut	10 ,, ,,
Cinnamon and Avocado Pear	10 ,, ,,
Sterculia Carthaginensis—"Coolie Pistache"	8 ,, ,,
Blighia Sapida—"Akee"	8 ,, ,,
Lucuma mammosa—Sapôte	8 ,, ,,
Nutmegs, $50 per 1000—$6 per 100, or	8 ,, ,,
Nutmeg seeds, preserved in damp earth—per 1000	9 dollars.
Cacao—in bamboo—each	3 cts. each
Palms—assorted Seedlings, per doz. $1.44, or	15 ,, ,,
Governor Plum—Locust and Genip	5 ,, ,,
Ravenala madagascariensis—Travellers' Palms	25 ,, ,,
Flowering Plants—general stock—according to size and quality	8 to 12 ,, ,,
Flowering Plants—rare	by exchange only.
Creeping Plants	8 to 12 cts. each.
Ferns—Common	,, ,, ,,
Ferns—rare	50c. to $5 each, or by exchange.
Orchids—mounted or unmounted—Foreign—from	24c. to $5.00 each.
Orchids—Native *mounted* or *unmounted*—from	24c. *to* 1.50 ,,
Shrubs—per dozen	1.20 to 2.40 ,,
Crotons—general stock—per dozen	96c. to 1.20 ,,
Crotons—or other rare plants	by arrangement.
Foliage Plants	12c. to 2.00 ,,

When plants are purchased by 100 or 1,000 a reduction will be made. Plants not in stock will be grown for applicants, a deposit of 10 per cent. on account being made on their value. A full catalogue and price list is in the press.

J. H. HART, F.L.S.,
Superintendent Royal Botanic Gardens.

18th December, 1890.

Section VII.—VISITORS.

Visitors to the large number of 704 registered their names at the Gardens; this number is an increase of 156 over 1889, and an increase of over 400 since the first year of my incumbency. (1887.)

The Wednesday and Sunday afternoon Bands have been continued as usual, the performers pitching their circle under the shade of a large Wallaba tree (*Eperua falcata*) immediately in front, but some distance from the Governor's residence. The Band has been much improved of late by the accession of a number of European performers, and by the talented supervision of Professor Rudolphsen, the Bandmaster. During rainy weather the want of a suitable Band Stand is much felt, and garden shelters to provide against sudden showers are also desirable for the comfort of visitors. In many places such buildings are given as commemorative objects by prominent public individuals. Let us hope for the early appearance of such a benefactor for the benefit of visitors to the Royal Botanic Gardens.

In order to give visitors every facility for obtaining information, the Superintendent devotes as much time as he can conveniently spare to their reception. A printed "Guide to the Gardens" is in course of preparation and will be issued it is hoped, early in the year.

But few cases of larceny of plants have occurred during the year, for the simple reason that the kind of plants usually chosen have not been placed in a position for persons to steal, but as this deprives many of the pleasure of seeing them, the fact of such conduct being too common, is much to be regretted.

As mentioned last year, the want is much felt of an ordinance giving power to make rules and regulations having force of law, for the better government of the Gardens as a place of public resort.

The majority of visitors to the Gardens (I have again pleasure in stating) have comported themselves in a most excellent manner, and I am satisfied that the general order maintained is not surpassed in any place of public resort throughout the British dominions.

Trinidad as shewn by the increase in the number of visitors, is becoming much more popular as a health resort than formerly, and I frequently hear it expressed that a much larger influx of visitors could be readily guaranteed were there better Hotels available, suitable for the entertainment of tourists. With an influx of visitors there assuredly follows an increase of trade, and seeing this is the case, it behoves our people to provide for the coming strangers by making adequate provision for their comfort.

Section VIII.—NURSERIES.

Again I am glad to be able to report progress in this section, the stock of plants having been largely increased in number, and considerable additions have been made to the ornamental section, by consignments from Europe which will be mentioned in the columns of this report annually devoted to the continuous record of importations. For want of such a record we have found ourselves at a great loss in arriving at a ready determination of the names of many introduced plants of former years, and consequently (coming as they do from countries, the Botany of which is not familiar to us, or of which we have no guide or books of reference), we are compelled to send them for comparison to the Royal Herbarium at Kew. Such a record faithfully kept for a series of years cannot fail to be of value as shewing at a glance when, and by whom, or how often a plant has been introduced, and the result as a failure or success whichever it may be. Some never like to record a failure, but I am inclined to think that policy is far from being an economical one. For instance, if a plant, said to be profitably cultivated in another part of the world should be introduced to Trinidad, and a fair trial given it in different positions, under various methods of treatment and the result was failure, it must surely, I think, act as a "caution" to those who had placed themselves in the position of would-be investors. On the other hand the converse holds good. A trial shewing that a plant can be successfully cultivated would surely support the intending investor in carrying out an experiment. A policy of "caution" is a safe one, and *Festina lente* is a good motto for the cultivator until he can make sure of data authorizing him to pursue a more energetic policy.

The Catalogue of the Garden and Nursery collection has been for some months in the hands of the printers, and it is confidently hoped that it will be in the hands of the public during the coming season.

The facilities placed at the disposal of the public for the free carriage of plants by Railway and Steam-boats, have been of much service to the various districts and our thanks are due to the Railway and Steam-boat authorities for the care they have given to the parcels of plants during transit.

The Plant Depôts at Princes Town and Arima have failed to justify the expectations that were formed of them when first instituted. Stations of this kind essentially require that men skilled in plant culture should have charge of them, and can only be successfully instituted when supported with funds adequate to the maintenance of small trial grounds and nurseries for the propagation and growth of economic plants especially suited to the surrounding districts, and under supervision of the Royal Botanic Gardens, in fact, forming sub-stations or subsidiary establishments completely under control of that establishment. Such stations would be of advantage to several parts of the Island, and this view is strongly supported by several gentlemen holding official appointments as chief Government Officers, or Wardens of the various districts. On these gentlemen would devolve in a great measure the control of these Nursery Gardens, and there are indications that the Government are willing to accede to their request to institute at least one or two trial Gardens in the districts where they are most required, if funds can be provided for maintenance, though with the free transit by Rail and Steamer the reason for their establishment has in a great measure disappeared.

We continually receive from the various Botanic Gardens abroad, catalogues of the seeds collected during the year, and we are grateful to the senders for their courtesy, but in a Tropical Garden of such as Trinidad, it is impossible to compile such a catalogue owing to the transient vitality of our seeds, as most of them would be useless before we could get it printed. We have, therefore, to adopt the much more expensive method of making all our exchanges in small quantities from time to time as the seeds ripen. Since this plan has been adopted, I find that our success in transmission has increased by over 50 per cent. I find it very difficult to make this understood by those who are accustomed to keep seeds for months or even years in temperate climates, but it is nevertheless, true, though many can only be induced to believe it until taught by their own experience.

All seeds sold in Trinidad should be imported at intervals of not more than three months apart, and the agents should be instructed to burn all those that had been three months in stock. Of course there will necessarily be exceptions, as some seeds will grow if kept for longer intervals, but for practical work the above course is recommended with confidence.

The principal introductions of the year have been three large Wardian Cases from the Royal Gardens, Kew.

One case from Brussels "Société Anonyme"—containing ornamental plants.

One case containing what are supposed to be Cubeb Peppers from Messrs. T. Christy & Co. of London.

One case from the Director Botanic Gardens, Singapore—through Kew—containing various ornamental and economic plants. And one box Sarsaparilla from the Revd. Bassett Key of Jamaica.

The cases from Kew arrived in splendid order and contained many interesting plants as shewn in our record list.

The most important introduction has probably been the case of "Gambier" or "Gambir" plants which was received at the latter end of the year. This came out in charge of Mr. Morris, the Assistant Director of the Royal Gardens Kew. The plants arrived in due course per Royal Mail Steamer "Solent" in excellent condition and are now thriving well so far as we can judge in the short time they have been with us. A further notice is given of these plants under the head of Economic Plants, Section XIV.

In connection with the Nursery Section, I may mention that a number of Cacao plants have been raised from a rather peculiar (and to me) unusual form of Cacao pod. The pods were small, thin-skinned, and borne in a regular cluster after the habit of many other Sterculiaceous plants, notably the Cola-nut (Sterculia acuminata) the arrangement of which they much resemble. It is not expected of course that we have discovered anything marvellous in securing a plant of this kind, but it is desired for the sake of Botanical investigation to see what will be the produce of a set of trees grown from such seed, it being one of the primary objects and duties for which a Botanic Garden is constituted. I shall be glad to receive at any time, any similar abnormal growths, special kind of pod, (as regards either form or colour or quality of contents) that any Cacao planter may be good enough to forward to me, for the purpose first of registering such occurrences, and for the purposes of further investigation.

Section IX.—ORCHIDS.

No Horticultural Establishment in these days is thought to be complete without a section especially devoted to Orchidæ, although from recent reports received from Europe, it would appear that the craze has reached its height—and rare orchids will never again demand the high prices they brought but a few years ago.

In Trinidad we do not possess many native kinds bearing abnormal value, though we have many very pretty species, and others possessing considerable interest from their singular form, or from the exposition they afford of peculiar botanical characters. The well known CATASETUM TRIDENTATUM *Hook.* is quite a common plant in the neighbourhood of the Botanic Gardens. There are letters filed in our office which show that several of the facts brought out in Darwin's work, on the Fertilization of Orchids, especially in respect to this species, were due in a great measure to the investigations pursued by the late talented Hermann Cruger, while holding the post of Government Botanist in Trinidad.

These observations have been continued, and have been productive of interesting facts as will be seen by the following paper :—

FERTILIZATION OF ORCHIDS.—A reference at the Linnean Society's meeting of April 4th, 1889, to the Fertilization of *Coryanthes macrantha* by a bee called *Eulœna cayenensis*, sent from the Royal Botanic Gardens to Mr. Morris—led me to refer to the previous notes on the subject published in *Gardeners' Chronicle*, May 6th, 1882, p. 592, and January 31st, 1885, p. 145.

It would appear that the observer (Cruger) takes it for granted that the bee is first attracted to the flower by the perfume exhaled, and afterwards remains to feed upon the "fleshy plate of the lips." It was rather unfortunate in the treatment of this question that the actual plant (*Coryanthes macrantha*) noted by Cruger did not come under observation in England, as the details of the structure of the two flowers is considerably different, and any inferences drawn from the form above must be purely speculative.

Having had the opportunity during four flowering seasons of watching the development of many flowers of this plant, I have been able to confirm Cruger's observations with regard to the manner in which the fertilization of the plant is effected as stated by Mr. Morris at the Linnean Society—but I cannot confirm his opinion that the insect's object in visiting the flower is to feed upon the "fleshy plate of the lips,"—as after very careful watching I have never found it to do so. The bee in visiting the flower, first alights at α (Fig. 1) and with its two fore legs attempts to reach up under the hood. In so doing the insect is often disturbed by one of its kindred, with the result, that having to extend its wings for flight, they are almost sure to come in contact with one of the horns which secrete the sugary liquor that falls into the base of the lip below. This renders the insect unsteady by adding weight to one of its wings and generally results in its falling backwards into the cavity of the lip, from which, there is no escape except by the hymeneal passage between the column and the lip, by which means the pollen is removed and fertilization effected.

After watching for a length of time the operations of numerous bees (of the same species) visiting the flower—I have been unable to detect them puncturing, or in any way cutting or drawing away "the fleshy plate of the lip." as Cruger asserts that they do. Instead of this, I was able to observe that the endeavour of the bee was to get below the hood as far as possible and to thrust his front legs into that particular space. To prove this more completely, I removed with a sharp knife the entire hood. The bees now instead of alighting as before at (α) Fig. 1., alighted immediately at point (x) Fig 3. This point consists of two series of fleshy plates inclined downwards, and thickly covered with short hairs or elongated cells containing granular protoplasmic nuclei, as shown by W. A. Herdman, Fig 27, *Gardeners' Chronicle*, Vol. 23., p. 145—only that my series of microscopic observations shew that the cells contain a larger number of granules than mentioned by Mr. Herdman. These elongated cells are destroyed by the bee, scratching among them with its fore legs. but I have never observed although I have watched, and have had watch kept for hours, that the bee used its mandibles in any way for cutting or gnawing the fleshy portions, in fact the insect goes repeatedly over the whole surface—and it would appear that as soon as the whole of the elongated cells are removed and the surface well excoriated that the attraction ceases and insects cease to visit the flower—although at the same time the perfume which was so prominent a feature at the period of anthesis, had apparently decreased but little in its intensity. Fig 3. at x and y shew the chief point of attraction for the insect, but by observing that this spot is rendered almost inaccessible by the hooded covering (shewn by dotted lines), it is easily understood how in the endeavour to escape the bee finds himself half drowned in syrupy fluid in the sack of the lip.

Having found that bees do not eat of the fleshy portion, it became necessary to discover the means by which injury was done to the parts mentioned by Cruger as being eaten by the bees. This task was not at all difficult as a visit to the flower at night shewed *Blatta occidentalis*, the ubiquitous cock-roach of the western World, hard at work with its very capable mandibles, thus releasing our friend the bee from the accusation, under which he has stood for the long period of 29 years since Cruger making his first notes on the subject, attributed to him the damage done to the flower, but it should be noted that Cruger also credited this same insect with doing a part of the damage. Fac-similes of our drawings, made by Cruger, have since been found in our *Herbarium*, so that it is distinctly proved that the same plant has been under the observation of both Cruger and ourselves.

TROPICAL ORCHIDS.—It is not generally understood, I believe, at home by cultivators how hard it is to maintain orchids in a robust state of health in the open air in the tropics, except perhaps those species which are indigenous and apparently almost ubiquitous. Several of these also refuse to flourish under any conditions in which we have

yet placed them under artificial cultivation. *Coryanthes* brought in from the woods in a flourishing state seldom increase in size, *Rodriguesia* and *Ionopsis* grow smaller and smaller by degrees, as the year runs on, and yet, if found flourishing on a branch in the garden where they have seated themselves naturally, they thrive well, and rapidly increase in size—why—we have yet to find out. Our well known *Diacrium* (*Epidendrum*) *bicornutum* and its near congener *Diacrium* (*Epidendrum*) *indivisum*, if we attempt to grow them in a basket or on a block they rapidly deteriorate, but place them on a growing tree where they get plenty of sunlight and air, and they thrive well, as might be expected after a due examination of their natural home. The former is found on rocks and branches of trees fully exposed to the wind and sun on the shores of the Bocas Islands. The latter is found inland only—so far as I am aware—its natural home being the branches of high trees, well exposed. Being a pure white flower and of smaller habit, it is much more adapted to the requirements of home cultivation than *Diacrium bicornutum*.

A thorough study of the natural habit of these plants would probably afford the information required by cultivators, especially if the atmospheric conditions were duly observed, though exposure, or degree of sunlight and shade should not be overlooked.

Phalœnopsis of several kinds have been recently introduced. These plants are considered somewhat difficult to grow under hot-house culture in Europe, but are here quite hardy and thriving plants, with a minimum of attention, being simply placed on small boards with roots fully exposed. As this class, from the great beauty and lasting character of their flowers, are long likely to be great favourites, means will probably soon be sought to grow them much more rapidly and economically than can be possible in Europe, and I know no place where such a suitable climate could be found as in the neighbourhood of our Gardens. The attention of European and American cultivators is called to this fact, and also to the fact that we are within easy reach by fast steamers, of most of the European markets. We find that *Phalœnopsis* comes well to us from Europe if packed firmly between layers of slightly damp moss.

Section X.—LIBRARY.

We have to record but few notable additions to our Library shelves for 1890, but the usual number of Periodicals, Magazines, &c. have been received, bound, and placed on catalogue.

We have to express our thanks to kindred establishments for exchanges of Reports and papers on various subjects.

Bound volumes of the Trinidad "Agricultural Record" have been received as issued, and two volumes of "Transactions of the Linnean Society" containing much valuable information have been added. A few of the most modern works of reference have been purchased during the year and included in our catalogue.

Among the most interesting receipts is a copy of the "Queensland Illustrated Guide." This contains a very complete and interesting account of the cultural Industries of Queensland, management of Crown Lands, Forestry, Mining, &c., &c. A similar work prepared in the interest of Trinidad could not fail to be productive of much permanent good to this Island. We are indebted to the Queensland Department of Agriculture for this volume.

The Handbooks on the *Amaryllidæ*, *Bromeliaceæ*, and the Fern Allies, published by J. G. Baker, F.R.S., F.L.S., keeper of the Herbarium Royal Gardens, Kew, have also been added to the Library.

The regular issues of Annals of Botany, and Hooker's Icones Plantarum, have also been received.

The annual binding has again been very efficiently performed by the Government Printing Department.

Section XI.—PLEASURE GROUNDS.

There is little of importance to record in this section for 1890. The usual routine labour, mowing lawns, cleaning walks, renovating beds, manuring, &c., &c. have been carried out as in previous years, and the general appearance of the grounds have been fully maintained.

The heavy rains of 1890, which were so continuous throughout the year caused a larger amount of labour to be expended on this section than usual.

For many years past seeds of *Ravenala madagascariensis* have been imported, and the plant has become quite a favourite with those whose hobby is the culture of ornamental plants. In the town of Port-of-Spain numbers of the plant may be seen peeping from among other trees, the peculiar form of its head of leaves obtaining for

it the local name of the "Travellers Palm"—That the plant s not a palm but a member of the order Scitaminecæ is well known to botanists, and I may mention for the information of non-botanists that its near allies are the "Balisiers" or Heliconiads, the Musas or Plantains and Bananas and the Strelitzias, all of which with Ravenala belong to the Tribe *Museæ*.

Several plants of Ravenala have fruited during 1890 in the Town of Port-of-Spain—our capital—but the plants in the gardens though apparently several years older, have not as yet produced fruit. The finding of a most singular specimen of fruit belonging to this order, was also reported during the year by the local press, it was supposed to be a hybrid between Ravenala and Musa. There appears, however, to be no direct evidence to support this view, other than the mere supposition that such a thing has occurred, from the peculiar form presented by the fruit, a photograph of which has been placed on record. We learn that the photo of the fruit was sent to the Kew authorities and that the reply from thence—as was to be expected—was purely non-committal, as it is a rule there never to decide upon a specimen from photographs alone. The photograph shews a fruit of an abnormal form, but of a decided Musa or Banana-like character. It will be interesting to note if anything of a similar kind is again produced. The Ravenala is said to be known in its home as the Traveller's Tree, from the large quantity of water which it collects in the axils of its leaves, and is said to be cultivated in dry and arid wastes where there is often a scarcity of water. If this is true (?) a singular fact with us in the West Indies is, that the tree thrives best where it finds a fairly rich and moist soil, and that in dry and arid places, it fails to grow to a size to be of any likely benefit to the wayworn traveller. It is also singular that fruit should be produced—the first time for many years—after an unusually wet season, if these trees are natives of arid districts.

Section XII.—PALMETUM.

The noble Palm *Corypha elata* mentioned in my two last Reports, commenced to ripen its seeds in May and July, 1890, and completed its fruiting period in September, when it was cut down. Measured as the trunk lay on the ground, it gave a length 70 feet, and diameter of stem 2 feet from the ground, 3 feet 4 inches Diameter of panicle of flowers 14 feet, height 12 feet. Hundreds of seedlings have been raised from the seed produced by the tree, and large quantities have been distributed.

Borassus flabelliformis did not produce fruit as was expected, the panicles of flowers dying away apparently for the want of fertilization; it is to be hoped better success will attend its next period of flowering.

One or two plants of *Caryota urens* flowered during 1890, but no fruit was produced, this and the above may be owing to the excessive wet season experienced.

Latania glaucophylla set several fruits, as was anticipated, but some naughty school-boys ("larrikins") took a fancy to pull off the fruit before it was mature. This and other practices became so serious during 1890 that the assistance of the police was called for, and an offender caught and carried before the magistrate, since which time the behaviour of these young people has exhibited a marked improvement.

Calamus palembanicus continues to flower, but has not yet produced seed.

Livistona altissima and *Pritchardia pacifica* produced us well ripened seed in quantities, and good supplies of *Caryota, Livistona sinensis, Livistona Jenkinsii, Oreodoxa regia* and *Attalea cohune* seeds were also produced.

Next year we hope to record the permanent planting out of several novelties to our collection, which have for two or three years past been carefully grown for that purpose. Among these is a fine specimen or *Licuala grandis,* which is very handsome as it now stands in large tubs in the nursery.

Section XIII.—DISTRIBUTION OF INFORMATION.

The time devoted to work of this description year by year increases as the Officers of the Establishment become better acquainted with the people, and the wants of the country. Few indeed are the days when there is no call upon our time for the purpose of obtaining information, and yet it is difficult to remember and record the amount of information so afforded. Visitors are always anxious to learn the different processes carried out in the Garden, and as much information as is possible has been afforded to each, with the view of making them well acquainted with the necessary initiatory steps of the most prominent cultural industries. It is proposed during the ensuing year to submit a scheme to His Excellency the Governor which will admit of a course of instruction being given in the practical and theoretical work of Agriculture and Horticulture. It is proposed to attach to the Garden a few *cadets,* or young men who wish to obtain a knowledge of Tropical Agriculture

previous to embarking finally in an agricultural career. A similar scheme was successfully initiated by Mr. Morris when Director of Public Gardens in Jamaica, and I have it from several of the young men themselves who were under my special charge in that Colony, that they are now extremely grateful for the opportunity that was afforded them of acquiring information, although at the time they were not able to appreciate the course at its true value. A course such as proposed will be the initiatory step towards an Agricultural School or College which it is hoped will be established later on, and will form a means of distributing information not to be neglected by a colony that should be in the first rank for Tropical Agriculture.

Section XIV.—ECONOMIC PLANTS.

During the year the Agricultural policy of the Trinidad Government formed the object of a pointed attack at the hands of the West Indian Committee in London. This policy plainly stated, is simply one which gives all the cultural industries equal terms of encouragement, and it is difficult to see any true ground for the attack, other than an inclination on the part of that august body to dictate terms in the future, as it has in the past, which would result in benefit to the Sugar planting community alone. The Botanical Departments in the greater number of British Colonies have for some years been encouraged to devote their attention to "Subsidiary Industries" and to endeavour to support the producing strength of the British colonial possessions by the introduction of products suitable to their various climates, other than those which have been cultivated as major cultivations for many years. In a great measure this policy arose from the unfortunate collapse of Coffee culture in Ceylon a few years since, and the decline of the Sugar interest in our sister Colony Jamaica and others, and the lamentable state of ruin to which cultivations of those products were reduced, shewing the need that colonies had for an energetic policy of the kind. The success which has favoured the policy in Ceylon and Jamaica is a guarantee of its value, and no other apology need be made for continuing it, with the view of assisting in the future, not only those who approve, but those who now so strongly oppose it. Such being the case and the subject having been brought up for discussion at the Central Agricultural Board, I felt it to be my duty to point out as strongly as possible the weak points of those opposing the policy which it is the work of the Botanical Department to take the lead in developing. These remarks were published in the local papers at the time, and from the notice taken of them in London, it appears that they had their intended effect.

It becomes more certain every day that Sugar will in a short time, (a few months probably,) be inevitably deposed from her proud place as the industry which forms the mainstay of the Island. We find from last year's statistics, that the export of Cacao has approached during 1890, to within the value of about £28,000 of Sugar, and that owing to the short crop of the present year, it is quite possible that the export of Cacao will be of greater value than that of Sugar for 1891. This being so, furnishes an additional reason why the Sugar interest should not dominate the counsels of Government, but assume the place into which it has fallen, as complaisantly as may be, and only attempt to ask in common with other cultivators, what is its just right and due.

SUGAR CANE.—*(Sacharum officinarum).*—So far as regards practical experiments in relation to the improvement of the cane itself and improved cultural operations, the details of which are available to the public, Barbados is far ahead of Trinidad. Although we have good reason to believe that many of our planters are keenly alive to the importance of the subject, yet it is also patent that they shrink from publishing results obtained.

The re-discovery of the possibility of producing canes from seed is a fact which apparently has attracted but little attention from the majority of our Trinidad sugar planters, and yet the results are bound to be pregnant for good to this important industry.

Mr. Neville Lubbock points to the bamboo as the size a sugar cane ought to grow, and I am constrained to believe that if such a size is unattainable, that still, there is plenty of room to increase the ordinary cane in size and productiveness. I am sorry however to have to put on record that little public interest appears to be taken in the subject, and of course under such conditions our Establishment cannot do as much as it could if more interest were taken in the matter.

On the publication of the discovery of cane seeds in Barbados, I made application to a number of Sugar planters by circular asking them to supply this establishment with arrows which appeared likely to produce seed. Not a single response was made to my applications and therefore we must be absolved from any reflection. It is evident we cannot grow a sufficiently large number of plants in our Garden area, to

proceed with the experiment on a large scale, but the cane plants that were raised from seed sent us in 1889 by Mr. Bovell of the Barbados Station, have done exceedingly well, and we shall be able, it is hoped, to ascertain their value when next season's growth is complete.

The number of plants which established themselves are very few—as, when freshly planted the seedlings met with such a lengthy period of heavy wet weather, as to completely destroy many of the weaker ones. I am indebted to Mr. Bovell for again sending me a consignment of seed in 1890, but although the same care was exercised as with the previous lot, not a single plant has been produced. This is not extraordinary when we consider the small number of seeds found in a panicle, or arrow—and we must hope for better luck next time.

The seed requires especial care in its first stage, and the young plant in its juvenile form is extremely tender and difficult to raise, but I should be extremely glad to undertake to grow any seed that is sent to me, into a stage fit for planting, for anyone who is willing to carry out the experiment is its entirety, which we ourselves are unable to do, owing to the restricted area at our disposal. A piece of ground at the back of the Royal Botanic Gardens is now for sale, and would form a very suitable spot on which to undertake an experiment of this kind. The purchase of this piece of ground was recommended to the Government two years since, but the price then asked was thought too high, but it is possible the owners may be willing now to reconsider the matter and to come to reasonable terms. On many grounds is the purchase of this land highly desirable, and it should be acquired if only on the ground of controlling the local sanitation in the neighbourhood of the residence of Her Majesty's representative—but its area would in any case be a decided acquisition to the Botanic Gardens, and would give room for experimental grounds very suitable for our purpose, and which are so urgently required for many new cultures, besides that of sugar cane seedlings.

The growth of our few plants of seedling sugar cane shews that there is a prospect of great variation among them, and this is one of the most important factors which could have presented itself, as it opens out the possibility of improvement from the cane of to-day, which cannot be too seriously examined. Planters should seriously consider this most important subject, for the information to hand is such as will indeed justify the pressure of these remarks. I shall be only too happy at all times to place my services at their disposal, either for the conducting of experiments, or for advice with regard to them. The promises held out by the Barbados experiments, together with the results already obtained, are sufficient to incite the emulation of all thinking men, and it is hoped that another year will not pass, ere some important step is made by the planting community, to set on foot an experimental station for the benefit of the Sugar industry. Such might easily be done under the auspices of the Central Agricultural Board, if planters would but unite in their efforts for improvement.

CACAO.—*(Theobroma Cacao).*—Considering the importance of the Industry a report from this Department without the mention of cacao, would be incomplete. Considerable interest has been taken in the matter of cultivation and methods of preparing cacao for market during 1890. In my last year's Report I noted that the prices for Ceylon cacao were higher than the prices obtained for the Trinidad product, and we have endeavoured by pertinent questions, and one or two published articles, to incite the attention of our planters to the matter. In many ways it is satisfactory to note we have been successful, and our efforts have resulted in a consideration of the question, which, though it did not come up to the expectations formed, yet still brought forward many important contributions to our knowledge of the subject. Many points raised have not received attention from this Department, it being thought better to defer such until the publication of my forthcoming *brochure* on the subject, which is not yet complete.*

The public discussion raised by the publication of the Prize Essays on the preparation of Cacao, was extremely interesting though as was to be expected in newspaper controversy, at times it became somewhat acrimonious. The Essays, four in number were published in the pages of the *Agricultural Record*, and have been in considerable demand not only locally, but abroad. In Ceylon they have formed the subject of correspondence and discussion in the agricultural columns of more than one journal.

It was mentioned last year that a model of an apparatus designed for the purpose of artificially drying cacao, was being constructed at the Royal Botanic Gardens. The model was finished in due course and exhibited at the Trinidad Exhibition which opened in October, 1890. The principle of the apparatus lies in the application of the system of hot-water heating to the general form of cacao drying-house in use in

* The work in question entitled "CACAO" is now complete and will shortly be issued (Aug., 1891).

Trinidad. Since completing the model I was requested by the Hon. Geo. Fitt to make a design for his "San Salvador" Estate, to heat a large house. This was done, and the material being imported from an eminent firm of Hot-water Engineers in London, it was erected and at work ere the close of the year. The owner considers its working has been most satisfactory, the ease with which it is managed by unskilled labour, and the small amount of fuel required being two most important recommendations which it commands. A much larger apparatus has been since designed for the "Las Cuevas" Estate of Lord Rendlesham upon the same principles.

The model established at the Exhibition was considered to be of equal merit to two other forms of apparatus exhibited, but was placed first on account of the ease with which the principle can be adapted to almost any form of cacao drying house now in use in the Island. It has been since improved upon, and is now in working order, and open to general inspection at the Royal Botanic Gardens. Advice in connection with this subject can be obtained at the Office of the Royal Botanic Gardens and I shall be glad to make appointments for that purpose.

A motion at the Central Agricultural Board proposing to institute a system of marks, was put forward by this Department to ascertain the feeling of planters and merchants on the subject of Government Inspection and grading of produce, but was not well received. It was thought that merchants and planters were quite able to look after themselves without Government intervention. Such may prove to be the case. but still, having seen the working of such a system in the Dominion of Canada, and seeing its evident advantages to their several articles of trade, and its benefits to producers, buyers and sellers, I could not refrain from bringing it forward to ascertain the opinion of the Trinidad planter and merchant with regard to it. Though shelved now it is probable that the time will come, when its advantages will be better known and understood.

At the Agricultural and Horticultural Exhibition held in October 1890, under the auspices of the Central Agricultural Board, some fine examples of cacao pods were shewn, and the cured cacao was also of the finest quality.

I have already spoken of a small and curious bunch of cacao pods which was exhibited at the same time. Cultivators of cacao should be constantly on the watch for variations which occur from seed, making a point of securing seed only grown from those trees, which are robust in health, good bearers, and produce cacao of the finest quality. *On no account should the planter trust to his contractor to procure seeds or plants, as these persons well know that it pays them best to plant trees of a hardy, robust character such as the "Calabacillo" variety, without having any regard to the character of the produce they yield,* for they are paid by the tree and they care not what produce it gives.

It is evident therefore the proprietor should take special care of his nurseries and see that seed of the best kinds only is selected, and not allow a single seed of inferior varieties to be sown. The inferior variety (*Calabacillo*) is, however not altogether to be condemned, for it will often succeed on lands where the superior kinds of cacao will fail to grow, and becomes the only resource left to the cultivator, but still in such cases it would be well to keep the produce separate from the best grades.

We have it in history, that in Jamaica Cacao was once extensively cultivated, but that it was destroyed by a blast. We have it, that in several other portions of the world, Cacao has been afflicted with various diseases when cultivated in large areas. Though far from wishing to become a profit of evil, I would ask the question, whether such blast, (of whatever character it might have been,) may not be liable to occur again? History teaches that when large areas of a single product are continuously cultivated, the balance of nature is upset, and when an enemy makes its appearance, the field for its growth is so large, that it is impossible for man to contend against its ravages.

The coffee leaf disease in Ceylon is a familiar instance, which resulted in the almost total destruction of an industry at one time perhaps the most thriving of the present century. What would be the state of Trinidad were such an affliction to fall upon our yeoman's industry, Our Cacao walks? Such would be too fearful to contemplate and should urge us at all risks—in season and out of season—to do our best to seek out other suitable "subsidiary industries" and to form *nuclei* of other products, if nothing else, which could be extended readily on signs of approaching trouble becoming apparent to our cultivators. For although cacao is to-day the second industry of the Island, and soon likely to become the first, it will probably have its bad times as well as sugar, and happy will be the proprietor who was wise enough in time of prosperity, to provide against future evil by having his eggs in several baskets.

FIBRES.—*Agave rigida var. sisalana.*—During the year we obtained from Messrs. Reasoner Bros. of Manatee, Florida, 10,000 bulbils of this plant and 2,000 from another source. Of this number 7,700 have been distributed to various applicants. The remainder deducting usual losses are still at the Gardens.

One thousand plants requisitioned by Tobago, and two thousand sent to the Convict Depôt are included in the above numbers.

The plants arrived in splendid order in the form of small bulbils, *i.e.*, small plants without roots. They were placed in beds close together for convenience of culture, and as soon as properly rooted were transplanted to a wider distance, where they have thriven remarkably well. This is the plant which (it would appear from all accounts) is now being cultivated so largely in the Bahamas and from which such "great expectations" arise. Up to present date, however, I have not been able to advise cultivators to do anything but to proceed with the greatest "caution," and in a late paper in discussing the matter with His Excellency the Governor, I propounded some questions which would have to be satisfactorily answered ere I could alter my opinion.

The following are the questions alluded to, which were printed in the *Agricultural Record* for February 1891 :—

1. Can a balance sheet yet be produced in the Bahamas shewing the cultivation and manufacture of "Sisal" to have been conducted at a profit?

Ans.—I have yet to learn so.

2. What was the cost of sending the hand-made samples from the Bahamas, and what profit did it leave?

Ans.—More than price realized, and, none I should think.

3. Has the Bahamas secured a economical machine for extracting Hemp, and has such been profitably worked?

Ans.—I fear not.

4. Why have all trials in Jamaica and Trinidad with Death's and Kennedy's machines shewn that they have not yet been worked economically in those islands?

Ans.—The machine can't do what it is said by the makers to do, according to Jamaica and Trinidad trials. They do not give sufficient out-put.

5. Are the greater number of Yucatan machines of Death's and Kennedy's manufacture, or have they other and more economical machines?

Ans.—No; and there is evidence to support the view that they have others.

6. Has anyone been to Yucatan who have fully classified botanically the varieties of plants used for the production of Sisal?

Ans.—No. If there has, why not publish the information.

The first three questions must be answered in the affirmative, and we must have favorable answers to the remainder (which I should only too gladly accept) before I should consider myself entitled to do otherwise than recommend great caution in investments in Sisal culture. Still at the same time I hope and trust the enterprise will turn out a successful industry and as prosperous as its most sanguine promoters expect, and we in Trinidad should be ready (and we have taken steps to be), to enter the field of competition so far as circumstances of climate, etc., will allow when the above points are successfully answered. It appears from information to hand that a large and profitable trade is being carried on in Yucatan in producing this fibre. That there are several varieties, perhaps species of plants is almost equally certain but from all we can gather there is as yet no clear nor definite account of what these plants are, nor is their scientific history at present clearly written.

We also learn from Reports that there are various machines at work producing Sisal Hemp. We try these machines in Jamaica and in Trinidad and they fail to give economical returns. Yet we attend to all the makers' instructions, we have them tried by expert engineers and yet fail to *produce enough fibre per day to pay working expenses* that is, standing as single machines. Why this is so, we know not, and the makers do not seem to be able to enlighten us.

The hopes of the Bahamas authorities appear to be extremely sanguine, but we have no definite information as to how they are justified, but His Excellency Sir William Robinson has promised to endeavour to get categorical replies to my queries which may justify a recommendation of the culture in strong terms.

The machines which we have had upon trial are those of Messrs. Death's; and Kennedy's Eureka Machine.

MAHOLTINE.—*Abutilon Periplocifolium,* G. Don.—This plant was cultivated to continue the experiment of the previous year A large quantity of seed was sent to the Convict Depôt with the hope that Mr. Meaden would be able to grow it somewhat extensively. Unfortunately Mr. Meaden went away on leave shortly afterwards, and the seed was not sown. Another supply of fresh seed has been recently forwarded,

and it is hoped to produce a few bales for export next season. Our work with regard to this fibre has raised very favourable comments from our brother agriculturalists in Martinique, and they are very enthusiastic over the matter, and I hear are preparing to grow it on a large scale. One of the chief points which render them sanguine of success, is *the ease with which the stems of the plant submit to decortication,* and ultimate preparation.

Of course it is hard to predict whether such a plant will ever be grown on a commercial scale, but from my sixteen years experience of West Indian fibres, I may say that I knew of none on which I can form a more favourable opinion than on *Abutilon periplocifolium* or "Maholtine."

I note that in the Bulletin, published at intervals by my Jamaica confrère, he reprints the report on fibres at the Indian and Colonial Exhibition. In doing so, he reprints the error in full, into which the expert fell, in concluding that the mahoe of Jamaica and the maholtine of Trinidad are one and the same thing. In my Report for 1888 I demonstrated that this was entirely a false conclusion. The mahoe of Jamaica is *Paritium elatum,* G. Don, and its varieties, while the "Maholtine" of Trinidad is *Abutilon periplocifolium,* G. Don. The former grows to a large tree some 20-30 feet in height, while the latter is simply a perennial growing at the utmost to 12-14 feet, with branches of small diameter and with but few laterals. The straightness of its growth being one of its best recommendations as a fibre plant.

BOWSTRING HEMP.—*(Sansevieria.)*—The fibre machines cleaned this plant fairly well, the objections being, deficiency of output and cost of working. It is of course possible that working expenses may be reduced, and the output increased, but we have as yet failed to do this, and have yet to learn if it be possible, and we think better to make frank statements than to lead the public to false conclusions.

The plant worked has been for sometime supposed to be by myself and others, *Sansevieria guineensis* but the receipt from Kew of a plant determined by them as the true *Sansevieria guineensis* makes it patent that our plant is incorrectly named and probably should be known as *Sansevieria longifolia* judging from figures published in the Kew *Bulletin.* The nomenclature being astray may probably account for an insufficient out-put by our machines, but as we have only a small quantity of the true plant as yet, it is out of our power to test that point. We have besides the above, *Sansevieria cylindrica,* and *Sansevieria zeylanica* the latter being obtained from Barbados *via* Botanical Gardens, Grenada, at the hands of Mr. W G. Smith, the recently appointed Curator. We shall try to obtain the other known species at an early date, so that we may have them on hand, if only for identification purposes, for the use of cultivators.

TOBAGO SILK GRASS.—*(Furcræa cubensis.)*—The extraction of Fibre from this plant which grows so readily in Tobago and Trinidad, was also tried by means of Death's and Kennedy's machine and was certainly the most promising of the plants under trial, as it gave the greatest output of fibre of first class quality. From the ease with which it grows it is doubtful if any other plant will be able to be grown in competition with it for fibre production; and the Fibre Company of Tobago are sanguine as to their ultimate success with their indigenous plant in preference to the imported Sisal, and it would appear that their reasons are sound, the fibre itself is first class—the plant is easily and cheaply grown, land is easily available, and the want of an economic machine is the only difficulty, and one which we all hope will soon be overcome. The plant is being largely cultivated at the Convict Depôt, Chaguanas—and large numbers have been planted on the Carrera's Island Prison lands, under the supervision of Lionel M. Fraser, Esq., Superintendent of Prisons.

RAMIE.—*(Boehmeria nivea. Hk.)*—Little or nothing has been done in respect to the cultivation of this plant during the year. At the Royal Botanic Gardens sufficient is kept on hand from which large areas might be planted if any demand were to arise. The less glaucous variety or *Ramie verte* is the stronger grower of the two varieties cultivated here.

MANILA HEMP.—*(Musa textilis, Nees.)*—A plant of the true Manilla hemp was received from the Royal Gardens, Kew, during 1890, and is growing well, and making numerous offshoots. It is probable that this plant may thrive better in our climate than in the northern West Indian Islands. In Jamaica its existence is said to be somewhat precarious, but when we consider that Jamaica is over one thousand miles away from Trinidad, it allows some latitude for differences in the suitability of soil and climate for various products.

GUNJAH.—*(Cannabis Sativa L.)*—During the year a gentleman applied to me for information with respect to the cultivation of this drug. In looking up the matter I found that with the present restrictions placed upon the sale and growth of gunjah

by Ordinance or Law (viz.) "a one hundred pounds license for every acre or part of an acre grown," it is quite possible while being within the law, to grow and sell the drug at a large profit.

Estimating the return of crop on an acre of land at half a ton, or roughly, one thousand pounds weight; by selling it at 16s. per pound, the large sum of £800 stands clearly revealed and as the cost of cultivating and curing the crop from the acre of land would probably at the outside, not exceed one-fourth of this amount, it would leave a clear profit of £500 per acre after the license has been paid.

As referred to in my previous reports, it seems clear that a somewhat anomalous distinction is made between this drug and others of the same character together with spirituous intoxicants, while I cannot find any statistics which support such conclusions. The chief medical authorities however hold that it is a most pernicious drug and their opinion should be entitled to respect. Opium is sold under much less restriction, (a one pound license only,) and opium dens are said to be on the increase among the labouring classes. Since my last report I have been summoned to give evidence in two cases of surreptitious Gunjah growing by Coolies, one of whom only was convicted. The seed can be readily purchased as "Bird Seed" in the stores in Town, and while such facilities exist, it is probable that much of the drug will be grown in outlying districts in defiance of the law.

FRUITS—MANGOSTEEN.—*Garcinia Mangostana L.*—The plants raised from the seeds produced in 1889 have grown fairly well and have been in great demand.

We find, however, that they do not grow as fast as plants introduced from the East, when raised in pots as seedlings. Seeds sown *in situ* have made four times as much progress as those sown in pots and carefully tended, the wherefore we hope to discover by careful observation.

Our grafting experiment has been continued and there is now a fair promise of success. Only a single fruit was produced on the large tree during 1890, but this was a large size, and such as to give us no trouble to realize why they are so highly estimated in the East. The average size fruit produced by our tree was 3 inches in diameter. Its succulent rind is about one-fourth of an inch in thickness containing a luscious pulp, which in our estimation fully deserves the highest eulogy which has ever been passed upon it by Eastern travellers. By invalids and those afflicted with fever, it can be eaten with the greatest relish and safety, and it is said to be a specific in attacks of dysentery. It is a tree that should find a home in all collections or orchards of tropical fruits, without fail. It is, however, somewhat difficult to grow. I have placed the Mangosteen first on the list of fruits on account of its rarity and excellence.*

BANANAS.—*Musa Sapientum* —Since my incumbency as Superintendent of the Botanical Department in Trinidad, I have endeavoured to encourage by every means in my power, the growth of the best form of Banana for purpose of export. This form of Banana is known by the local name of "Gros Michel Fig." It is known in Jamaica as the Martinique Banana or as "The Banana." The Dwarf Banana *(Musa Cavendishii)* is known in Jamaica as the Chinese Banana but is here locally known as "Governor Fig," and in some of the other islands as "Figue Trinidad." This Banana when well grown is also suitable for export. The Red Banana or "Red Fig" comes next in estimation for this purpose, The other smaller varieties such as "Figue Soie" and "Figue Sucre" are considered as unsuitable for export purposes, but are deemed good desert fruits. At our Exhibition in October last it was gratifying to note the improvement in the production of "Gros Michel" and the growth which it has made in popular favour. since attention has been called in various ways to its value. The consignment of plants introduced from Jamaica have proved by comparison that the Jamaica export banana is nothing more than what is locally known here as the "Gros Michel Fig" and the culture at the Chaguanas Depôt shows—according to Mr. Meaden—that our plant is quite equal to the Jamaica variety. I am of opinion, however, that in some instances the "Gros Michel" of Trinidad has deteriorated, and will not produce as large bunches as the freshly introduced plant from Jamaica. Change of planting stock always acts in a way to retard the deterioration that takes place when the same variety of plant or seed is continuously grown in the same district for any length of time.

In the disposal of Bananas and Plantains which are now a waste product upon many cacao plantations where they are grown for shade purposes and which for want of transit accommodation cannot be placed upon the market, there has been decided progress made during the year. It has been shown that the dried ripe fruit can be made into an article which will find a ready sale in temperate climates. When put up in the form adopted by the Trinidad Prison authorities they resemble in appearance the dried "Elemi Fig," and can be produced and sold at cheap rates, thus making a fair profit out of what was formerly a waste product.

* At the time of publication one tree is again showing flowers and promises a fine crop of fruit.

The preceding method has been shewn to be capable of developement into an important industry, but there is also another resource which has lately been attempted with no small measure of success, this is, the manufacture of the Plantain meal which is so highly spoken of by Stanley in the account of his latest journey through Africa. It is to be understood that from any plant belonging to the genus Musa, there can be made from dried unripe fruit a wholesome and palatable meal containing constituents capable of sustaining human life for long periods. It is easily digested and in the form of gruel makes a very nourishing form of food for infants and invalids. If it were taken in hand in an energetic manner by capitalists. there is good reason to believe that it would soon establish itself in the Island and abroad, as a food of the greatest value for the use of hospitals of all kinds, and as a nourishing food for private individuals and young children.

We note that samples of this food has been shown at every tropical exhibition for many past years—we find tasty cakes and biscuits made from it, but as yet no one has been found to take up its manufacture in a wholesale manner and make known its useful properties to the world at large. I am confident that if carefully taken up that it would soon outrun in sale the celebrated "Revalenta Arabica" food, which has so many vaunted properties in curing the "ills that flesh is heir to," especially Dyspepsia and allied disorders.

ORANGES.—(*Citrus aurantium.*—Recent experience has fully proved that Trinidad can grow a quality of orange unsurpassed by any other West Indian Island and the efforts to start a trade in this fruit have not been without a certain measure of success. The efforts of His Excellency the Governor to induce proprietors to plant up areas with this fruit found full expression, by the issue of placards calling the attention of the people to the prospects of increasing their income by that means. The placards were issued in English, Spanish, Hindustani, and the Patois so commonly spoken by our native population. The English edition is here given :—

TO AGRICULTURISTS OF ALL CLASSES.

Have you ever heard of the Oranges of Florida? Perhaps not! Well, they are a most sweet and luscious fruit. Florida is the most Southern of the United States of America. Orange culture is an industry of comparatively recent growth there, but it is now well established, and thousands of people, both large and small planters, are making plenty of money by it. The oranges grown in some of the Bahamas Islands, and especially in Andros Island, are quite as good as those of Florida.

Millions of oranges are sent every year from the Bahamas, Jamaica and Florida to New York, and they find a ready sale. Two or three years ago England imported in one year, 180,000,000 oranges from the Azores. That only means six oranges for every man, woman and child in Great Britain. More are wanted for England, for America, and for Canada especially. The population of these great countries is increasing most rapidly. The demand for oranges is increasing. Where is the supply to come from? Trinidad can grow fine oranges? How many people grow them? We have not enough for our own wants! Is there any man in the valleys of Diego Martin, Maraval, Santa Cruz, St. Joseph, or Couva that has 100 trees in bearing? I do not think so; and yet these shady and well-watered valleys and districts would yield their millions, and these millions if properly picked, and packed properly in paper, and in crates, would find a ready sale. Mr. Russell Murray of Port-of-Spain, will buy all you can send him at 55 cents per crate of 155, and he will supply you with the crates, paper and nails for nothing. 200 orange trees are sufficient for one acre of land.

A good Orange tree will give you between 400 and 1,000 oranges a year. An Orange tree will bear for 60, 70 or even 80 years. Mr. Hart has at the Botanical Gardens over 2,000 young trees, these are being sold at two cents each.

I much wish to encourage the growth of this and other fruit, and the Agricultural Board, of which I am President, will give a prize of £50 to the first man who can show the best acre of growing orange trees 3 years old, and £25 to the first man who can show the best half-acre. Whilst the trees are growing you can raise pumpkins, melons, and other vegetables between the rows. By these small industries every man who has a cottage, and a few square yards of garden can improve his condition. He can get money enough to pay his children's school fees, to buy for himself and his wife some good clothes for Sunday, to go to Church in, and he can after that put the remainder of his earnings into the Savings Bank, and thus have what is called a "Nest egg," which perhaps in his old age he may much want.

Between September 1st and December 31st last year, we sent 853,000 oranges to America. I want 85,000,000 to be sent, and it only remains for you to grow them. If you want any instructions as to soil, cultivation, picking, or packing, come and see me or the Superintendent of the Botanical Gardens.

WILLIAM ROBINSON.

GOVERNMENT HOUSE,
12th January, 1891.

Consequent upon the issue of this placard numerous applications for plants have been received, in fact *more* than the resources of the Gardens are able to supply. Immediate steps however, have been taken to remedy the deficiency which arises from such an unusual demand ; large quantities of seed have already been procured.

By desire of His Excellency the Governor, I have compiled a statement of the conditions under which the prizes will be given, for insertion in this Report, and for publication in the local press. It is as follows:—

PRIZES FOR ORANGE CULTURE.

BOTANICAL DEPARTMENT,
March 19th, 1891.

His Excellency the Governor desires it to be notified for general information that the following are the conditions under which the prizes will be given for the cultivation of oranges:—

1. Notice must be given of the intention to plant on a certain date (or of having planted) one acre, or half an acre with Sweet Orange trees *(Citrus Aurantium)*, to the Superintendent, Royal Botanic Gardens.

2. The situation of the grove, the owner's name, and the name of the cultivator, and whether owner or tenant, must also be furnished at the same time.

3. The prizes will be awarded by the President of the Agricultural Board on the Report of the Secretary of the Board and Superintendent of the Royal Botanic Gardens, or Officers holding those appointments for the time being.

4. No other permanent crop to be upon the ground planted with Oranges, other than necessary or suitable shade-trees. What constitutes necessary or suitable shade to be determined by the above Officers appointed to visit the plantation, to report for the award of prizes.

5. Before the award is made, it is intended to advertise the date on which all claims must be sent in, and the date on which the award will be made—for a period of three months previous to such dates.

6. Trees must be planted at not less than fifteen or more than twenty feet apart each way to obtain a prize, and each acre shall contain not less than 100 trees.

7. No application to enter the competition will be entertained if received after 31st December, 1891.

By Order

J. H. HART, F.L.S.,
Superintendent Royal Botanic Gardens.

CITRON.—*Citrus medica.*—A fair stock of plants of the true Citron are now on hand for distribution but it does not appear that any great demand is likely to arise.

Anent last year's discussion on the nomenclature of the citron I find that Nicholson's Dictionary of Gardening thus plainly and clearly describes it.

CITRUS MEDICA—"The fruits of the Citron were called *Mala medica*, or *Mala persica* by the Romans from the country of their origin. Citron or Cedrat. Fruits "often six inches long, ovate with a protuberence at the tip; usually nine-celled; "pulp-white, and commonly acid: fluid—yellow, thick, hardish, odoriferous, irregular; "esculent, both raw and preserved. Leaves—oblong, obtuse; petioles naked, branches spiny. Asia 1648." There can be no doubt that citrons of large size and excellent quality can be abundantly produced in Trinidad if any regular demand were to arise. This "demand to arise" is a somewhat hackneyed and worn out phrase, and it is now the work of men who have charge of the growth of articles of produce,—TO CREATE A DEMAND by placing the material on the world's markets for a time,—until possible consumers have seen it and tried it. On sending the rind of the citron to New York in brine it was found to be unknown in that form, and yet we know that it passes that stage before being made into "Citron Peel" in the Mediterranean towns, and that America imports the prepared article, seems equally certain. Is it not possible for our growers to ascertain whether the confectioners in New York and other cities cannot be induced to prepare their own article from our raw material? If Trinidad put the raw material into the market at a reasonable price, it would appear likely that before long some one would be found to work it up in forms fit for the consumer at a good profit.

LIMES.—*Citrus medica var. acida*, Hk.—Until recent years we find that the fruit locally called the "Lime" was almost unknown in European Markets. In my Report for 1887 I pointed out that Sir Joseph Hooker had only as lately as 1884 described the plant scientifically from a plant growing in the Gardens of the Earl of Ducie. Under this authority the West Indian lime is made out to be merely a variety of the "Cedrat or Citron"—Citrus Medica, although the fruit is so totally dissimilar.

During the past year a large export of limes has been made to the United States, where they are much appreciated, Trinidad limes bringing the highest in the market. The firm of Messrs Turnbull, Stewart & Co are already making arrangements for the season of 1891 by advertising for high class fruit 1,030,000 limes were shipped last year, and during this year it is expected to increase the number sent by 400 per cent.

LEMON.—*Citrus limonum.*—An importation of seed of the true Sicily lemon was made during 1889 as mentioned in the Annual Report for that year. This was made in consequence of a discussion at the Central Agricultural Board, on the desirability of introducing the true plant from Europe. Over 300 plants some 12-18 inches high are now on hand ready for distribution.

The true lemon does remarkably well in Trinidad and should have a good sale in European and American markets, where the common, spurious, spongy kinds are utterly unsaleable. The characteristics of a good lemon are the whiteness of its pulp, and the firm and solid texture of the whole fruit, combined with a fine and delicate aroma. These qualities are absent in the spurious, spongy, hybrid varieties, whose name is legion in most of the West Indian islands. These numerous varieties of so-called lemons have an undoubted influence on the sale and growth of the true variety, as they always result in loss when put upon the market, and the quotations being given for lemons leads to a false impression as to the value of the true article, as not a single fruit of it has been sent to the market from Trinidad. The characteristics of the worthless kinds are the verrucose appearance of their outer skin, the pliability and spongy softness of the same, and the softness and sub-acid flavour of the pulp, while the fruit itself is often twice the size of the true Sicily Lemon.

In Jamaica, in Trinidad and the several other West Indian Islands I have visited, the variation in the genus Citrus is very great, the characteristics of the citron, lime, orange, and shaddock are present in such a varying degree, that in no other way than by admitting the possibility of hybridity can the large amount of variation be accounted for. Personally I am convinced that hybridization takes place freely among many species of the genus Citrus, and I always advise growers to root out any bad or worthless tree from among the more genuine. and to keep their stock trees of limes and lemons and oranges separate and distant one from the other. No seed should ever be taken from trees when other varieties or species are growing close by, or the result will be a field of hybrids of all sizes and flavours instead of an area producing fruit of uniform quality.

MANDARIN OR TANGERINE.—*(Citrus nobilis.)*—This orange is much grown in the Lower Antilles, as the islands to windward are sometimes called, and its cultivation has long been maintained in Trinidad from whence it is probably it was originally distributed, and where it is much appreciated as a desert fruit.

What I consider to be a variety of this fruit, is known in some of the Islands as the Grenadine, it being supposed to have originated in Grenada. It is a fruit as large, or larger than the common sweet orange, but it possesses the character of the tangerine blended with some of the flavour and form of the shaddock.

In the nomenclature of the mandarin and tangerine there is much confusion. There are primarily two varieties of Citrus nobilis, with sub-varieties varying in character. The red skinned is in some places known as the mandarin, and the yellow skinned as the tangerine, while in other districts a reversed state of nomenclature is maintained for the same fruits. With quick transit I consider the above a very suitable fruit for export to the United States, but the journey is much too long to any English Port for them to be safely carried over in large quantities.

NUTMEGS.—*(Myristica fragrans.)*—The year has brought little or nothing new with regard to the cultivation of this plant, unless it be Mr. Morris' recommendation to the Grenada people—after seeing some of their plantations—to make their Island THE Spice Island of the West. Grenada is certainly well suited for the cultivation of this spice, but we have yet to learn that we have not in Trinidad as many facilities as the Grenada grower. At present however, it must be confessed that we have no plantations to equal those of Grenada ; yet there are doubtless numerous localities which are especially suited for the growth of the plant to be found in Trinidad which are equal to those in Grenada. The most favourable site for a nutmeg plantation is that affording a rich soil well protected from the wind. The soil at the Royal Botanic Gardens is well known to be of an indifferent character, and to resemble a hand-baked red brick more than a soil fit for general cultivation ; yet, even in this unsuitable soil, the nutmeg thrives well, if irrigated during lengthy periods of drought. Our trees are very fine and annually produce a large crop of nuts. The Garden however, being freely open to visitors, many nuts are lost by being carried away as curiosities, or for other purposes, and thus all hope of ascertaining the real value of a tree is lost—but it is estimated that a tree from 15 to 20 years of age should yield at the rate of £2 per annum on an average. Trees commence to bear in our Gardens without any special care, in about 4 years—but of course, the yield is small at first.

In planting it is recommended that trees should be put in, in threes, one foot apart, so as to afford an opportunity of retaining as many males as required, and further to select the strongest bearing trees after they have reached the stage which declares their sex. The distance from group to group depending much upon the soil and the pleasure of the cultivator. Personally I am in favour of thick planting. We can always cut away a tree, but we cannot get them to grow easily when surrounded by large trees. The general character of the leaves of the two sexes are apparent to a skilled cultivator, but I have yet to meet anyone *who could infallibly* tell one sex from the other until the flower appeared.

We charged at the rate $50:00 per 1000, $6:00 per 100, or 8cts. each for plants eighteen months to two years old. While fresh seeds preserved in earth can be had at the rate of $9:00 per 1000. During the year we sold no less than 18,600 nutmeg seeds of which over 10,000 were used in the island by our local planters.

RUBBERS.—*Castilloa elastica*, Cav.—*Ficus elastica*—*Heveas of sp.*—*Manihot Glaziovi.*—There is I am glad to find an increasing demand for this class of plants, and we have sold numbers of the Central American rubber plants during the year. We have now two trees which are fruiting freely from which numerous plants are raised. The increasing demand for rubber owing to the various modern applications of the product promise at no distant time, to raise the culture of these plants into an industry of no mean character. In fact, at the present time, it is believed to be a secure investment to plant largely rubber producing plants suitable to the climate in which we reside. We have several kinds of these plants well established in our Gardens, the most prominent being *Castilloa*. I learn it is doing well in Tobago.

Ficus elastica or East Indian rubber probably comes next in its suitability for cultivation, and it has been strongly recommended by the Kew authorities during the past year as suitable for extensive culture. Next to these, comes *Hevea brasiliensis* or Para rubber. This tree thrives well and produces rubber of excellent quality. *Hevea Sprucei* or Demerara rubber is also represented in our collections.

Manihot Glaziovi can be readily grown in almost any kind of soil existing in the island, especially that suitable to the growth of its congener *Manihot utillisima* or cassava, and the rubber can be easily extracted.

TOBACCO.—*(Nicotiana Tabacum.)*—Our endeavours in the cultivation of tobacco have been confined to a series of experiments conducted on a small area of suitable land situated in the village of Siparia, in the south of the island. A crop was reaped early in the year, and was cured and exhibited at the general Exhibition held in October 1890. The quality could not be considered as first class, but the weather of 1890, it should be remembered, was probably the worst on record for a series of years, for the tobacco industry. In fact we find by our statistics that on only two occasions has there been such an exceptional season as during 1890, for the past twenty-nine years. The wonder is therefore that any tobacco was produced at all, and under the circumstances the quality must be considered as satisfactory. It is hoped during the year to produce Tobacco of a much higher class, and an article of which none but those ignorant of the quality of the fragrant weed can have anything to say, but in its favour. At the time of our writing this report—March 1891—the crop is in excellent order and the harvesting has just commenced. The leaves are fine and of good colour. The tobacco grown is solely of the Cuban variety, which is remarkable for its kid glove like appearance, its small veins, its high aroma, and the small size of its leaves in comparison with the more vigorous Turkish or Virginian varieties, the leading idea pursued in the experiment being *to produce a good cigar-tobacco.*

COFFEE.—*(Coffea Arabica and C. Liberica.)*—The year has again furnished unmistakable evidence that coffee can be well grown in Trinidad, if only properly cultivated, but I find a general disinclination to cultivate it, in any other but in a desultory kind of way along road sides, or mixed with other cultivations. On an estate in Santa Cruz, I hear that coffee was cultivated with excellent results although not planted systematically.

On some few estates a number of plants have put out, but our sale of plants was not as large as were the orders, consequent on several persons not sending for their allotment. A fair supply of good plants remain on hand, but I fear Trinidad Cacao presents for the time being superior inducements.

GAMBIR —*Uncaria gambir*, Hunt.—In November of 1890 we received a consignment (40) of plants in excellent condition from the Royal Gardens, Kew. They were cared for on the voyage out by Mr. Morris, the Assistant Director of that establishment who is well known to take an untiring interest in the introduction of economic plants of a useful character, and he believes it to be likely to prove one of the most useful introductions of recent years. So far, it appears to thrive well with us and does not require any special care. We have no special information with regard to its culture, but the following is extracted from *Spon's Encyclopedia of the Industrial Arts.*

"*Gambier* or *Gambir* is a tanning substance extracted from the leaves and young shoots of a plant known as *Uncaria Gambir.*

"The plants may be stripped three or four times a year. In preparing the substance for the market the young shoots and leaves are boiled in large iron pans for about an hour, and after draining the resulting liquor is corporated to the consistency of syrup, when sufficiently cool it is subjected to a peculiar stirring process when the whole gradually sets into a firm mass, resembling yellow clay, which is cut into cubes

and dried in the shade. The leaves are sometimes boiled a second time and again washed in water, which is then used to treat a fresh supply of material. The shrubs are cultivated in plantations often formed in jungle clearings, and it is said to be advantageous to combine black-pepper culture with that of *Gambir*. *Gambier* is also known as *Pale Catechu* and *Terra Japonica*, and its present value upon the market is 27s. per cwt., the principal imports coming from Singapore and the Malay Peninsula."

When sufficient plants have been raised to authorize us making a general distribution, the fact will be duly advertised in the *Royal Gazette* and local newspapers, so that planters will have equal opportunities of receiving allotments from the first offered lots.

TIRITE.—(*Ischnosiphon Parkeri*, Körn—*Ischnosiphon Arouma*, Körn). The bamboo like stems of the above named indigenous plants are used for the manufacture of "Indian baskets" in many parts of Trinidad. These baskets are commonly used as trunks by the poorer classes, and travellers often buy and use them in the place of a portmanteau, for which purpose they are eminently suited, on account of their durability, strength, and lightness. When carefully made they are very serviceable and handy, and nearly water-tight. Panniers for mule back are also made of the same material—in fact they are known on the mainland as "Paniers Caribes."

The plant grows plentifully in many districts of the island, and there is no doubt the sale of these baskets or trunks might be made a profitable export business if taken up with spirit. Long circular plaited appliances about 6 inches in diameter and 4 feet in length having a loop at both ends, are also made of this material, and used for expressing the poisonous juice from the manioc or bitter cassava after the roots have been grated into a pulp.

COUSIN MAHOE.—During the year the veteran and much respected doctor the Honourable L. L. A. de Verteuil gave to the public the virtues of a remedy which he had used in treating dyspepsia, and liver complaints. The honourable doctor, however, gave us the scientific name of his plant as *Triumfetta semitriloba L.* Knowing there was a great confusion in the nomenclature of the plants, locally known as "Cousin mahoe", specimens of each of the species of Triumfetta credited to Trinidad by Grisebach in his flora of the British West Indies were collected, and specimens were also secured of the two Urena's, sinuata and lobata, each of which produces a similar kind of *carpid* or "cousin" (as it is called in Creole French) as does the Triumfetta. After considerable discussion, and after laying specimens of each on the table of the Agricultural Board, there has been found to be a general consensus of opinion, that the remedial virtues attributed to Triumfetta semitriloba L. are not really due to that plant, but to Urena sinuata L. It is to be stated however, that nearly all the species of Triumfetta, and both species of Urena are "Cousin mahoe" to the general public, and to most of them are also ascribed the same or similar virtues as are attributed to the veritable "Cousin mahoe" *Urena sinuata L.* or *Cadillo de perro* of the Spanish tongue, but the latter plant is the most commonly used both in Trinidad and on the mainland as a remedy for disorders of the liver and of the digestive system.

VIOLETTE.—(*Chione Glabra D. C.*) Under the above name, I mentioned in last year's report, a bark said to be used for certain purposes in Grenada owing to its aphrodiasiacal properties. A consignment of the bark has been sent for examination to England and to an eminent firm of American chemists and druggists, by special request after reading our report, and we have recently heard that the "investigations thus far have proved quite interesting, and that they should soon have something definite to communicate".

ROUPALA MONTANA, *Aublt.*, is credited with similar properties to the above, and there are yet several other barks and leaves commonly used by natives of Trinidad which are fully deserving of investigation if only for the purpose of dissipating the mystery and superstition which surrounds them, but it is quite possible that in examination for one principle, others of a useful character may be discovered.

There has also been collected for examination and report, specimens of the following plants :—VERVAIN—*Stachytarpheta Jamaicensis V.*—BRINVILLIERS—*Spigelia anthelmia L.*—POUTT—*Piper ovatum Vahl.*—ANGELIN—*Andira inermis Kth.* A preparation of the second plant has been well known as a vermifuge for many years, but it is now required for further investigation.

Piper ovatum has had the reputation for many years of being possessed of medicinal properties, while to this day hunters in the Trinidad forest use a tincture of the plant to dress their dogs previous to starting on an expedition. It has a strong and pungent odour, and when chewed, leaves a peculiar deadening sensation upon the tongue. It undoubtedly possesses peculiar properties, and well deserves the examination that is now being given to it. Cruger a former botanist, collected specimens of the plant, and Purdie in 1848 affixes to a specimen the following note—"The root of

the plant dried and powdered is used as a remedy for glanders and hydrophobia in horses and dogs." It was sent to me as *Actea racemosa* by the late Mr. J. McCarthy, Government Analyst for Trinidad in 1888. It was said at the time to be a remedy for the bites of venomous snakes.

CARDAMOMS.—The Cardamoms still continue to thrive with but very slight attention, and they have fruited so plentifully as to lead to the belief that they should be much more cultivated in Trinidad than at present. They produce mature fruits at intervals during a greater part of the year which only require picking and drying, to fit them for market. It is a plant that can be cultivated in almost any shady, moist position. The present value of cardamoms is from 1s. 2d. to 3s. per lb. Fresh seeds can be obtained at the Gardens on lodging an order a short time previous to their being actually required for sowing.

PLANT CULTIVATION FOR EXPORT.—The firm of nurserymen who have commenced this business in Trinidad have been very successful in producing decorative plants of various kinds. Palms, Dracænas, Pandanads, Cycads and other plants, of a character that render them amenable to lengthy transport, comprise the large bulk of the plants grown. During the months from May to September, large consignments leave by the direct New York steamers once or twice a month for sale in the New York markets. The business is in the hands of Messrs. Seibright and Wadley of New York, and locally was conducted by Mr. Louis Roempler but this gentleman fell into bad health early in the year, when Mr. H. W. C. Dihm was sent from the United States to take up his duties.

The work accomplished is certainly surprising even to professional men, and sets an example for good to many of our brother colonists. It is to be hoped the firm are making the business a financial success.

We are in a position to frequently serve them by the free gift of seeds which would otherwise be wasted, for which we get in exchange an adequate return from their introductions which are very serviceable to us.

Section XV.—KITCHEN GARDEN.

The kitchen garden forms a useful adjunct to the Botanic Gardens proper, and a continuous series of experiments have now been instituted in the growth of various foreign legumes and other vegetables with the view of testing whether they are suitable for use in our climate. Some of our common plants appear to be almost unknown in the East Indies, except by name, and when sent thence from us are thought much of. For instance the Lima and sugar beans sent to India during 1890, have been highly commended, yet it seems extraordinary that such common West Indian plants should not have been previously sent for cultivation to the east, yet perhaps the very fact of their being so common here, is the reason which has led to their limited distribution. As an instance we may mention that only a few years since our common "CHRISTOPHINE" or "CHO-CHO" *(Sechium edule)* was first sent successfully from the Jamaica Garden to Ceylon. Finding this to be the case with our products, we ask our correspondents to send us for trial anything they may have in the way of common vegetables, which are likely to prove useful importations to the island of Trinidad. Early in the year we found in our local markets small tubers tied in bundles, being sold in a cooked state as "TOPEE TAMBOU" or "TOKEE NAMBOO" *(TOPINAMBOUR)*. Some of these were grown for experiment and were found to be produced by a plant which has not as yet been determined. A reference to Kew shews that the tubers were not known to be used as a vegetable. The main roots or rhizome send off numerous offsets, oval in form, and varying in size from 1 to 2½ ins. in length, and from ¾ inch to 1½ ins. in diameter. After the tubers are boiled, they are generally eaten cold. In flavour they much resemble a rather nutty-flavoured, cold potato. For the tropics it is certainly a plant that should be found in every kitchen garden. Dr. H. A. A. Nicholls of Dominica during a recent visit, tells me that the plant is known under a similar local name in that island. In Sir Joseph Hooker's description of *Cienkowskia Kirkii*, Bot: Mag: 5994, he describes the plant as having "roots of tuberous fibres emitted from a fleshy root-stock." This plant was introduced to London in 1872. It is possible that to this species, our plant belongs, as we find a misplaced label bearing that name among our collection of plants together with several species of *Kæmferia* which were probably introduced during Mr. Prestoe's incumbency, 1864 to 1886.

Our *confrères* of the Jamaica Botanical department are, I find from recent reports, also engaged in the experimental cultivation of vegetables, especially at their Hill Station. The value of such records cannot be too highly estimated when continued for a series of years. The unfortunate loss of the records kept for several years by Mr. Wm. Nock (a former superintendent) in the hurricane of 1880, must be severely felt, as those records would have been of the greatest value now that experiments have

again been resumed. The want of permanent record of experiments is felt in many establishments, and in none more so than in our Botanic Gardens in Trinidad. These I am sorry to say, can only be gathered piece meal from various sources previous to the year 1880, when the series of annual printed Reports was first commenced. Hence we shall endeavour to put on permanent record by this means, anything bearing the character of an experiment and its result, for future reference and guidance; but the experiments now commenced are not sufficiently advanced to justify their publication.

Section XVI.—NATURAL HISTORY NOTES.

TUSSER SILK—(*Antheræa mylitta D.M.*)—After several attempts to introduce these worms to the West Indies, a successful issue was accomplished through the kindness of J. F. Duthie, Esq. B.A., F.L.S., Director of the Botanical Department, Saharanpur Northern India. Mr. Duthie is well known to have taken great interest in the silk industries of India and my application was made to him on seeing published accounts of his work. The application met with a most cordial response, and on the 15th of May by Parcel Post there arrived here a consignment of cocoons which were despatched from India on March 24th, having been 52 days in transit. The cocoons were packed in cotton wool in small cardboard boxes and addressed as an ordinary parcel. On opening the boxes many of the insects were found to have escaped from the cocoons and had perished. There were however some 35 unbroken cocoons and the insects commenced to escape from these the day after arrival. A further consignment was received by the following mail which contained a larger number of cocoons. The insect appeared to be in perfect health on emerging from the cocoon. Cages were made for them and large quantities of eggs were laid, the greater number of which proved infertile, owing to the apparent disinclination of the insects to assume the hymeneal condition. At length a batch of about 200 eggs were hatched out, and the insects were fed on the leaves of *Terminalia catappa* their natural food plant. They thrived fairly well and reached the cocoon stage, when after lying some thirty days they again emerged in the *imago* form. Here the same difficulty presented itself as with the preceding generation, and in consequence only a few fertile eggs were secured. It being probable that the failure to secure fertile eggs was the result of too close confinement, it was resolved to attempt the culture out-doors on the *Terminalia* trees themselves, and we are yet awaiting another consignment for that purpose, which we trust will be more numerous so as to allow room for more than one experiment. The Government of India have been communicated with on the subject of the introduction of *Attacus Ricini* or the Eria worm, which, if it could be introduced would probably be found more suitable for West Indian culture than either of the other wild East Indian silks.

TRINIDAD AND SOUTH AMERICAN SILK WORM.—(*Attacus Bolivar*).—Mr. Henry Carriciolo a most enthusiastic collector sends me the following notes of an insect under the above name which are extremely interesting:—

"This silk moth belongs to the family Bombyces under which are also found the genera Sericaria, Bombyx, Ongya, and Siparis &c., all silk producers.

In April 1890, I captured several "Attaci" but did not take much interest in their value as silk producers, until stimulated by a report of Mr. Hart's cocoon introduction from India described in the *Agricultural Record* page 204, vol. 2, 1890, in consequence of which I sought for the cocoons of the two insects, but without success. Knowing that it was also a native of South America, I endeavoured to procure some living cocoons from thence, and shortly afterwards I had the pleasure of receiving from a friend in Bolivar, several specimens one of which I had the pleasure of watching emerging from its pupa case. This turned out to be a female, and twenty-four hours after, it deposited some 200 eggs. Owing to the want of a companion these did not hatch, although the raising of perfect insects through, the action of parthenogenesis, from an infertilized female is I am led to believe, not uncommon. The egg of the insect is white, oval shaped, with a very hard shell, difficult to break with the fingers. The cocoon measures an inch or sometimes 1½ inches in length, oval in form, and generally attached by a strong ligature to the branch on which the insect has been feeding in its final stage. The silk of which it is composed is very pale, bronzy colour. almost approaching white, and is of very fine texture*. The moth itself measures 3½ inches from tip to tip of its anterior wings. It is brown in colour, stuated with lighter markings, and has an irregular transparent spot on each of the fore and hind wings, bearing the appearance and texture of a thin sheet of Talc.

"Insects of the *Genus Attacus* are known to produce silk of the finest quality, and some of them are extensively domesticated in China. *Attacus atlas*, an eastern insect and one of the largest moths known, measures sometimes as much as 11¾ inches

* The cocoon is very similar indeed to that of *Antheræa mylitta*, the Tusser silk moth India.

across its wings. Although *Attacus Bolivar* is said to be a native of South America, there is strong reason to suppose that it also is indigenous to Trinidad, as I have captured large numbers of them at different times and have also seen them in other collections. The food plant of *Attacus Bolivar* is for the present unknown, but I expect to have good evidence to hand shortly."

The insect has also been captured by Mr. Broadway on a Brazil nut tree in the Royal Botanic Gardens in July, 1890. There is also another species which has been provisionally referred to the *Genus Hyperchiria Hubn.*—some caterpillars of which were found by Mr. Broadway, who kindly gave me a few. These were received on the 10th October, 1890, and fed up to the 13th when they began framing their cocoons by bringing together one or two leaves and spinning a deep coloured bronze silk around their new home, the moth making its appearance on the 9th November. This nest or cocoon is very similar in shape and texture to that of the North American *Actias Luna*; specimens of both have been sent to England, France, and America, for identification and report.

GRU-GRU BEETLE.—*(Rhynchophorus sp.)*—This beetle was lately found by Mr. Clairmonte in large quantities in the stumps of recently cut down coco-nut trees. Three years ago it was found in large numbers in the stumps of *Elæis Guineensis*, and in the body of a large *Oreodoxa regia* in the Botanic Gardens. The larvæ of this beetle is sought for by epicures as a particularly rare delicacy and in several instances we have been asked for them for this purpose. They have an enticing and appetising smell when well cooked, and by all who have tasted them they are declared to be a rich *bonne bouche.*

It is probable that there are allied species which attack palms, and that the *larvæ* of some of these are eaten as well the one under notice. We are not certain to what species our specimens belong, but they are provisionally included under the name *Rhynchophorus palmarum*, Linn., until a more authentic determination reaches us. The fact that this order of insects is known to enter the stem by any cut or broken surface on any kind of palm or other tree, should be a warning to cultivators to be extremely careful how they allow the use of the knife, cutlass, or axe among their plantations, and point a moral to the pruner of cacao trees, who leaves his branches to rot upon the ground thus affording to these insects a most suitable place for uninterrupted increase in their numbers. All wounds to trees of whatever character, accidental or otherwise, should be speedily covered with a mixture composed of gas tar and clay which will effectually prevent beetles of this class entering the freshly cut wood. We have found from practice at the Royal Botanic Gardens that a crop of "gru-gru" worms may be speedily raised in the trunks of the 'Oreodoxa' or cabbage palm, if two small incisions are made into it sufficiently large for the gru-gru beetle to enter and deposit its eggs. Specimens of the beetle can be seen at the Gardens, and also of the cocoon which were kindly brought us by Mr. Clairmonte and contained a mature living specimen of the palm beetle, thus affording direct evidence of the life history of the insect. We shall be glad to receive specimens of any kind of distructive insect from correspondents. They can easily be preserved in any kind of spirit.

FISH.—*(Haplochilus Hartii nov. sp. Boulenger).*—This is one of the small species of fish found in the fountains of the Gardens. It is plentiful in the St. Anne's river, from which the water supply is derived. It was sent to the British Museum and named by Dr. Gunther the eminent authority on fishes.

Dr. Gunther having requested me to make the attempt, I despatched to England by Mr. A. Aitken, chief engineer R.M.S. "Larne," a small glass vessel containing about a dozen specimens of *Girardinus Guppii* another small fresh water fish, also native of the St. Anne's river. Under the instructions of Dr. Gunther and by the unremitting attention of Mr. Aitken we succeeded in sending the little brood safely to London, and deposited them in the hands of Dr. Gunther, who writes that he is perfectly delighted with the success attained, which only shews, as he says, what might be done in transporting tropical fish to England with due care. It is probably the first time that West Indian fish have been transported alive to Europe. Towards the end of the year Dr. Gunther writes *that the fish are thriving and re-producing their kind very freely in the tanks at Kew, where he lives, so that it is possible they may become naturalized.* In connection with the propagation of these fish is the curious fact that when placed in company with the common gold fish, the latter fail to increase in number through the voraciousness of the little *Cyprinodonts.*

ANT-EATER.—*(Myrmecophaga tetradactyla.)*—A specimen of this quadruped was found feeding upon trees in the valley above the Gardens, where a gang of prisoners were at work, who immediately killed the animal. The skin was preserved for our collection after first being sent for determination to the British Museum by whom it was returned with the wish that a similar specimen could be procured for the Museum.

SPIDER.—(*Eurypelma versicolor*, Wallk.).—This large spider locally known as the "TARANTULA," is commonly to be seen on trees in the Garden. It seldom leaves its web except during the night hours. Consequent upon its reputedly poisonous character it is generally destroyed as a nuisance and pest. On our part we endeavour by every means to protect these insects as we are conscious of the large amount of good they do in destroying insects which are hurtful to vegetable life, while they themselves are perfectly harmless, unless hurt or injured. In fact it is a very timid creature and runs at the first sight of danger. It is very amusing and instructive to watch one of these animals carry off the large "drummer" cockroach, *Blaberus giganteus. Linn.* and convey him to his "parlour" where literally there is probably "many pretty things to show him when he is there". The true "tarantula" is an Italian species and differs much from our West Indian specimens.

MOLE CRICKET.—*(Scapteriscus didactylus)*.—Our mole cricket formerly known as GRYLLUS CAMPESTRIS is now to be spoken of under the above name in scientific language.

WATER SNAILS.—*Ampallaria (Marisa) cornuarietes*, Linn.—Mr. R. J. Lechmere Guppy to whom I am indebted for the above name, informs me that these belong to a very well known species in the Neo-tropical regions, and that its occurrence in these Gardens was noted in the Proceedings Scientific Association of Trinidad, vol. I. p. 34, as long ago as 1866. During the term of my incumbency here (since 1887) it has not been previously observed, but this season it has wrought considerable destruction to the water plants in one of our fountains, so much so, as to cause us considerable trouble in the endeavour to exterminate them.

BATS.—*Saccopteryx leptua Schreb.* This is a small and peculiar bat having a small pouch at the principal joint of each wing, the purpose of which is at present unknown. The British Museum authorities write, in forwarding the determination "*observations on the use of the wing-pouch would be most valuable.*" Another small and rare bat named *Schizostoma megalotis*, Gray, was also discovered in the Garden.

Year by year our observations prove that bats have a wonderful influence upon the vegetable world, for not only do they convey fruit and seeds for considerable distances, but they also effect the fertilization of many of our larger trees, by their attacks on the flowers for the purpose of procuring honey and probably insects. They also devour fruit in great quantities, and in our kitchen garden the fruit off the Lima bean in their young state has at times been completely destroyed by them, the bats opening the pods and shelling out every bean when about half mature.

FROGS.—Two species have been recently found in the Gardens, and named by the British Museum Authorities as *Leptodactylus typhormis Daud, Leptodactylus caliginosus.*

Our thanks are due to Dr. Gunther (and his assistants) at the British Museum, for their kindness in determining a large number of specimens in several classes of Natural History, which we have sent from time to time.

Mr. Broadway's list of insects is attached hereto as an Appendix. It does not pretend to be a regular classification but simply a record of specimens identified during the year.

PARASOL ANT.—*Œcodoma cephalotes=Atta cephalotes.*—In connection with this insect it is to be noted that a large winged insect sent in by several corresponents as the female or queen of the parasol ant, has been named by the Museum Authorities as *Atta fervens* say. p. I would therefore be obliged to any one for further evidence as to its relationship with the "parasol ant," and the ground upon which such evidence rests.

A law providing certain means to help in the destruction of parasol ants has recently been passed by the Legislature, rendering it lawful for the Governor to proclaim a district an infected one, and allowing persons to enter upon strange lands for the purpose of destroying ants' nests. It remains to be seen whether this will meet the case or whether a more effective measure will have to be devised. One thing is certain that with an increase of cultivation, the damage done by these insects will be more severely felt throughout the Island, and agitation will not be likely to cease until the pest has been fairly overcome.

Section XVII.—FORESTRY AND REBOISEMENT.

In consequence of the mention of the question "Forest conservation in Trinidad" in my Report for last year, the Secretary-of-State for the Colonies has requested that a full Report upon the subject shall be sent home. His Excellency the Governor has been good enough to instruct me to prepare a report upon the subject, and I have been for some months employed in the collection of statistics &c., from the various districts.

In the meantime it may be mentioned that the same rate of destruction yearly goes on without attempt at *reboisement* except in a few isolated cases of no great importance so that in a few years' time the whole of the natural forest on all accessible lands in the island, will be given over to the hands of the cultivator, to be destroyed at will, for as yet no one apparently deems the forest worth preserving, nor will they do so probably, until it is all gone ; then assuredly, the people of Trinidad will regret the careless destruction with which they have treated and visited the once luxuriant Forest.

Section XVIII.—ILLUSTRATIONS.

Our first illustration shews the building devoted to the purposes of Herbarium Library and offices of the Botanical Department.

On the lower floor is the Superintendent's and Clerk's office, and Library, while the upper story contains the Herbarium cabinets, the larger books of reference, the microscopic and preparation tables.

The second picture shews the stem of our quaint looking "Cannon ball" tree *Couroupita guianensis* in full fruit.

No. 3 gives an illustration of *Licuala* Sp., a palm growing in the Superintendent's Garden.

While the last shews a fine photo of *Latania Loddigesii (L. glaucophylla Hort)*. and another of *Astrocaryam aculeatum*, Mey, growing in the Palm walk. These illustrations are reproduced from photos taken by Messrs. Morin of Port-of-Spain.

Section XIX.—VEGETABLE PRODUCTS.

The annual Report of the Customs Department affords the following statistics with regard to vegetable products exported and imported during 1890 :—

IMPORTS.

Nature of Produce.	Quantity.	Estimated Value.
Corn	135,684 bus.	£ 20,448 0 0
Flour	119,858 brls.	120,678 0 0
Meals (not wheaten)	6,257½ ,,	4,108 0 0
Coco-nut Oil	54,185 gals	7,627 0 0
Sugar	590,999 lbs.	7,444 0 0
Tea	40,720 lbs.	3,093 0 0
Tobacco (unmanufactured)	529,344½ lbs.	10,196 0 0
,, (manufactured)	46,337½ lbs.	2,998 0 0
Cigars and Cigarettes	13,737½ lbs	4,344 0 0
Plantains and Yams...	...	5,855 0 0
English Potatoes	...	6,965 0 0
Sweet Potatoes &c.	...	2,062 0 0
Plants	...	42 0 0
Vegetable Products (unrated)	...	41,345 0 0
Onions	...	5,533 0 0
Garlic	...	2,147 0 0
Peas and other Legumes	...	5,251 0 0
Total Principal Agricultural Imports for 1890.	...	£ 250,136 0 0
The total Imports for the year amounted to ...	...	£2,179,432 0 0

EXPORTS.

Nature of Produce.	Quantity.	Estimated Value.
Sugar ... ...Home Produce	115,239,227 lbs.	£ s. d.
,, ...Foreign ,, ...	103,520 lbs.	632,796 0 0
Cacao ... ...Home ,, ...	21,562,593 lbs.	
,, ...Foreign ,, ...	2,389,969 lbs.	603,506 0 0
Molasses	2,024,884 gals.	62,929 0 0
Coconuts ...Home Produce	12,739, 904	
,, ...Foreign ,, ...	308,618	43,740 0 0
Rum ... ...Home Produce	20.469 gals.	1,958 0 0
Coffee ... ... ,, ,, ...	12,597 lbs.	
,, ...Foreign ,, ...	118,314 lbs.	4,519 0 0
Bananas, Native	...	46 0 0
Limes and Lemons, Native	...	632 0 0
Oranges ,, ...	...	828 0 0
Un-enumerated Fruit ,, ...	...	63 0 0
Tobacco Snuffs	471,463	9,720 0 0
Plants, Native	...	704 0 0
		£1,361,441 0 0
Adding as in previous years for record Asphalt ... ... £ 89,481 0 0 Bitters 43,266 0 0		132,747 0 0
We have a total of Agricultural Exports		£1,494,188 0 0
Value of the Total Exports for the Island amounted to...		£2,248,893 0 0

The total Imports for 1890 amounted to £2,179,432 in value, or an excess of £85,000 over the previous year—1890—£2,179,432 and—1889—£2,093,932.

The Exports of the colony for the same periods were less by £59,938 8 11—1889 £2,308,832—and 1890—£2,248,893.

The increase in the export of fruit is small, but when it is remembered that two years ago it amounted to practically *nil*, it is some satisfaction to be able to record a total export of over fifteen hundred pounds or $7,200 for the past year, or an increase of over £1,000 on 1889.

I am glad to note in the annual return of the Customs Department, an increased attention to the rating of imports which must have entailed a considerable increase of work on that Department ; but cannot fail to afford considerable information to those engaged in commercial pursuits and to statisticians.

An export of £704 for plants is an encouraging feature. On making direct enquiry of the Customs department as to what composed the large amount of "unrated vegetable products", I was informed that there were large quantities of Tonkin beans or "Serapia", imported from the mainland, which accounts for the large sum of £29,591 standing under that head. This product is introduced into the colony in large quantities, and prepared in bond by steeping for some time in spirit (rum), and then again drying the produce for export. As shewing the value of statistics of this class, it is easy to see that while Venezuela can from her virgin forests send into the market, through Trinidad alone, the amount of £20,000 worth of Tonkin beans, it is useless for the planter to attempt to compete with them when we consider the cost of the cultivated article.

The value of the export of Pitch was less by about £593 than the sum realized for 1889.

The imported value of unrated vegetable products for 1890 was £41,345, a small decrease on the previous year, which may be accounted for by several products being put upon the rated list.

The increase in the export of cacao is somewhat remarkable being an increase of no less than £125,166 on the previous year's value, while practically the same amount of foreign produce was imported for re-export. It is probable that at the end of the next ten years, Trinidad will double or treble her export of this article, as the crop is being cultivated in every direction. Sugar on the contrary shews a decreased export value of £245,005 on the previous year, and only exceeds the cacao export in value by £29,290, and it is highly probable that next year the cacao crop will much exceed the sugar crop in value. This is a somewhat significant fact for those who maintain that sugar is the mainstay of the Island.

Coconuts shews a slight increase over the previous year, while the export of coffee is somewhat smaller than during 1889.

The Total value of Imports and Exports from 1888 to 1890 are shewn in the following table :—

	1888.	1889.	1890.
EXPORTS :—	£2,132,761	£2,308,832	£2,248,893
IMPORTS :—	2,043,789	2,093,932	2,179,432

J. H. HART, F.L.S.,
Superintendent.

PLANTS AND SEEDS DISTRIBUTED.

Three hundred and twenty-one packages of seeds, and forty-four thousand four hundred and thirty plants were distributed to correspondents, together with eighteen thousand, six hundred nutmeg seeds. The following is a list of recipients abroad :—

Director Royal Gardens	... Kew.
,, Botanic Gardens	... British Guiana.
,, ,, ,, ...	... Saharanpur.
,, ,, ,, ...	... Singapore.
,, ,, ,, ...	... Calcutta.
,, ,, ,, ...	... Hong Kong.
,, ,, ,, ...	... Mauritius.
,, ,, ,, ...	... Ceylon.
,, ,, ,, ...	... Adelaide.
,, ,, ,, ...	... Melbourne.
,, ,, ,, ...	... Queensland.
,, ,, ,, ...	... Ootypoore, India.
,, ,, ,, ...	... Tasmania.
,, ,, ,, ...	... Jamaica.
,, ,, ,, ...	... Buitenzorg, Java.
Curator ,, ,, ...	... Grenada.
,, ,, ,, ...	... St. Lucia.
,, ,, ,, ...	... St. Kitts.
,, ,, ,, ...	... St. Vincent.
,, ,, ,, ...	... Antigua.
,, ,, ,, ...	... Dominica.
,, ,, ,, ...	... Gold Coast, Africa.
The Secretary Agri-Horticultural Society ...	... Madras.
Landreth & Co.	... Philadelphia, U. S. A.
His Excellency Sir W. Hely Hutchinson ...	... Grenada.
C. S. Sargeant, Esq.	... United States.
Dr. H. H. Rusby	... Do.
Dr. Schuchardt	... Germany.
S. P. Saunders Esq.	... Nassau.
J. R. Desbaut Esq.	... Grenada.
Mr. Van Waart.	... Canada.
Miss Tharme	... England.
Dr. L. C. Washburn	... Florida, U. S. A.
A. J. A. Bruce	... Manchester, England.
L'Horticulture Internationale Societe Anonyme	... Bruxelles.
Wm. Gordon Esq.	... England.
J. O'Brien Esq.	... Do.
Thos. Christy & Son	... Do.
Wm. Harris Esq.	... Nova Scotia.
T. L. Mead Esq.	... Florida, U. S. A.
Miss Willington	... Tobago.
Haage & Schmidt	... Germany.
Mr. McLean	... England.
Mrs. J. S. Stocks	... Do.
W. B. Lindsey Esq.	... St. Vincent.
The Fibre Company Limited	... Tobago,

PLANTS AND SEEDS RECEIVED.

To the following correspondents are due our acknowledgments for contributions of seeds and plants. A total of three hundred and eighteen packages of seeds, and seven hundred plants were received during the year :—

Director Royal Gardens	... Kew.
,, Botanic Gardens	... British Guiana.
,, ,, ,, ...	... Hong Kong.
,, ,, ,, ...	... South Australia.
,, ,, ,, ...	... Singapore.
,, ,, ,, ...	... Calcutta.
,, ,, ,, ...	... Saharanpur.
,, ,, ,, ...	... Java.
,, ,, ,, ...	... Ceylon.
,, ,, ,, ...	... Mauritius.
,, ,, ,, ...	... Bangalore.
,, ,, ,, ...	... Bombay.
,, ,, ,, ...	... Port Darwin.
Curator ,, ,, ...	... Grenada.
,, ,, ,, ...	... St. Vincent.
,, ,, ,, ...	... St. Lucia.
Secretary Agri-Horticultural Society ...	... Madras.
Dodd's Botanical Station	... Barbados.
James Veitch & Son	... London.
Thos. Christy & Son	... Do.
L'Horticulture Internationale Societe Anonyme	... Bruxelles.
T. L. Mead Esq.	... Florida, U. S. A.
Rev. E. Bassett Key	... Jamaica.
D. Landreth & Son	... Philadelphia, U. S. A.

APPENDIX I.

LIST OF PLANTS AND SEEDS INTRODUCED DURING 1890.

NAME.	A.	B.
From Royal Gardens, Kew.		
Ravenala madagascariensis	S	*
Bucklandia populifolia	S	*
Eucalyptus tesselaris	S	F
Eucalyptus crebra	S	F
Eucalyptus tereticornis	S	F
Agave heteracantha	P	F
Abutilon vesuvius	P	*
Abutilon Richesse	P	*
Abutilon Glorie de St. Martin	P	F
Ophiopogon japonicum	P	*
Chorizema spectabilis	P	F
Enlalia zebrina	P	*
Habrothamnus Schotti	P	*
Iochroma tubulosa	P	*
Centropogon Lucyanus	P	*
Rondeletia amœna	P	*
Rondeletia superba	P	*
Rondeletia gratissima	P	F
Magnolia fuscata	P	*
Choisya ternata	P	F
Chironia peduncularis	P	F
Embothrium coccineum	P	F
Veronica Andersoni	P	*
Veronica speciosa	P	F
Veronica lobelioides	P	*
Clivia nobilis	P	*
Cyperus Meyenianus	P	*
Hibiscus rosa-sinensis (yellow var.)	P	*
Statice arborescens	P	F
Clerodendron fœtidum	P	*
Hydrangea hortensis	P	*
Abelia floribunda	P	F
Arctotis aspera	P	F
Senecio Ghiesbreghtiana	P	*
Veronica salicifolia rubra	P	*
Musa rosea	P	F
Musa textilis	P	*
Piper sp. (Singapore)	P	*
Aristolochia ridicula	P	*
Capparis frondosa	P	*
Hippocratea volubilis	P	*
Amomum Danieli	P	*
Vitis acuminata	P	*
Heteropterys chrysophylla	P	*
Ardisia Oliveri	P	*
Faradaya splendida	P	*
Wrightia zeylanica	P	*
Gynocardia odorata	P	*
Ficus infectoria	P	*
Alpinia Galanga	P	*
Bauhinia sp. (Maritzburg)	P	*
Manihot gemmipara	P	*
Brunfelsia Sieberi	P	*
Uvaria sp. (Monteiro)	P	*
Palaquium oblongifolium	P	*
Gymnema sylvestris	P	*
Erythroxylon Coca (Ceylon)	P	*
Sterculia sp. (Natal)	P	F
Dorstenia Barteri	P	*
Coffea arabica var.	P	*
Eugenia lanceolata	P	*
Ficus Vogelii	P	*
Ormosia coccinea	P	*
Napoleona imperialis	P	*
Vanilla aromatica	P	*
Strelitzia reginæ	P	*
Manettia bicolor	P	F
Papaver somniferum	S	*
Uncaria Gambir	P	*
Havanna Tobacco	S	*
Arisæma speciosum	P	F
Arisæma praecox	P	*
Spathantheum heterandrum	P	*
From Botanic Gardens, Calcutta.		
Phœnix (Date)	S	*
Arenga saccharifera	S	*
Caryota urens	S	*
Calamus Roxburghii	S	F
Caryota elata		F
Phœnix paludosa		*
From Botanic Gardens, Saharanpur.		
Pollinia eriophoda	S	F
Trophis aspera	S	F
Cupressus torulosa	S	F
Hibiscus sp. (fibre plant)	S	F
Caryota urens	S	F
Celastrus paniculatus var.	S	*
,, Malkangui	S	
Desmodium tiliæfolium	S	F
Datura Stramonium	S	*
Panicum sp.	S	F
Michilus	S	F
Nicandra physaloides	S	F
Smilax macrophylla	S	*
Euonymus japonicus	S	F
Tabernæmontana sp.	S	F
Linociera macrophylla	S	F
Rosa moschata	S	*
Jasmine humile	S	*
Symplocos serrata	S	F
Malachra capitata	S	*
Viburnum stellatum	S	F
Rhamnus virgatus	S	F
Rhamnus sp.	S	F
Stauntonia latifolia var. Ramketa	S	F
Ilex dipyrena	S	F
Senecio sp.	S	F
Lythrariæ	S	F
Umbelliferæ	S	F
Myrsine semiserrata var.	S	F
Spiræa sp.	S	F
Callistemon lanceolatus	S	F
Albizzia stipulata	S	F
Sterculia elata	S	*
Chamærops Fortunei	S	*
Phœnix acaulis	S	*
Pinus longifolius	S	F
Bassia latifolia	S	F
Hybrid Amaryllis	S	F
Lawsonia inermis	S	F
Suræa (?) indica	S	F
From Botanic Garden, Ceylon.		
Cynometra ramiflora	S	F
Ægle marmelos	S	*
Styrax Benzoin ?	S	F
Cedrela toona	S	F
Zanthoxylon khetsa	S	F
Cassia siamea	S	F
Feronia elephantum	S	F
Flacourtia inermis	S	F
Crossandra undulifolia	S	*
Allamanda Schottii	S	*
Erythrina lithosperma	S	F
Albizzia lebbeck	S	*
Cananga odorata	S	*
Cassia fistula	S	F
Peltophorum dasyrhachis	S	F
Adenanthera microsperma	S	*
Parkia Roxburghii	S	F
Canarium zeylanicum	S	*

A.—P. Plants. S. Seeds. B.—* Succeeded. F. Failed.

APPENDIX I.—Continued.

LIST OF PLANTS AND SEEDS INTRODUCED DURING 1890.

NAME.	A.	B.
From Botanic Garden, Ceylon.—Continued.		
Sesamum occidentale	S	*
Adenanthera bicolor	S	*
Lagerstroemia flos-reginæ ...	S	F
Brunfelsia americana	S	F
Kleinhovia hispida	S	F
Ipomæa coccinea	S	F
Dichorisandra Aublatiana	S	F
Cæsalpinia coriaria	S	F
Acacia farnesiana	S	*
Calpurnia sylvatica	S	F
Areca concinna	S	F
From Botanic Gardens, Adelaide.		
Elæocarpus cyaneus	S	F
Acacia melanoxylon	S	F
Callistemon speciosus	S	F
Pultenæa dentata	S	F
Grevillea incarnata	S	F
Indigofera decora	S	F
Eucalyptus melidora	S	F
Elæodendron australe	S	F
Gaultheria hispida	S	F
Fugosia hakeæfolia	S	F
Acacia pycnantha	S	F
Eucalyptus globulus	S	F
,, gomphocephala	S	F
,, marginata	S	F
,, siderophloia	S	F
,, rostrata	S	F
,, longifolia	S	F
,, leucoxylon	S	F
,, amygdalina	S	F
,, cornuta	S	F
,, hemiphloia	S	F
Acacia mollissima	S	F
,, dealbata	S	F
Lagunaria Patersonii	S	F
Cassia Brewsteri	S	F
Humea elegans	S	F
Pultenæa stipularis	S	F
Boronia megastigma	S	F
Phebalium squamulosum	S	F
Viminaria dentata	S	F
Shorea purpurea	S	F
Santalum prescienum	S	F
Clianthus Dampieri	S	F
Agonis flexnosa	S	F
Notelæa longifolia	S	F
Brachysema lanceolata	S	F
Bignonia australe	S	F
Mirbelia dealbata	S	F
From Botanic Gardens, Singapore.		
Cyrtostachys Renda	S	F
Gnetum latifolium	S	F
Myristica furfuracea	S	F
Kentia Mc Arthuri	S	*
"Buah Romang"	S	F
Faradaya	S	F
Garoinia dulcis	S	F
Sindora sinamensis	S	F
Semecarpus Anacardium	S	F
Susum anthelminticum	S	F
Adesocalyma nitidum	P	*
Clerodendron nutans	P	*
Canrensis maxima	P	*
Durio zebethinus	P	F
Garcinia Mangostana	P	F
Pierardia dulcis	P	F
Eugenia densiflora	P	*

NAME.	A.	B.
From Botanic Gardens, Singapore.—Continued.		
Artocarpus sp.	P	F
Cinnamomum Camphora	P	*
Aglaonema nitidum	P	*
Homalonema sp.	P	F
Dracæna Cantleyi	P	F
Pandanophyllum	P	*
Phyllagathis rotundifolia	P	F
Ataccia cristata	P	*
Cyrtostachys sp.	P	F
Spathoglottis plicata	P	*
Angiopteris evecta	P	*
From Botanic Gardens, Hong Kong.		
Livistona chinensis	S	*
Rhodolæna championi	S	F
Sida corylifolia	S	F
Coffea bengalensis	S	*
Vitis Martini	S	*
Pitcairnia pyramidalis	S	F
Chinese "Green Cabbage"	S	*
,, White ,, ...	S	*
From Botanic Gardens, Buitenzorg, Java.		
Livistona altissima	S	*
Oreodoxa oleracea	S	F
Cyrtostachys Renda	S	*
Drymophlæus ceramensis	S	*
Chrysalidocarpus lutescens	S	*
Calamus Dr. Ouley	S	F
Livistona Hoogendorpii	S	F
From Botanic Gardens, Grenada.		
Calophyllum calaba	S	*
Swietenia Mahogani	S	*
Sesamum orientale	S	*
Cola acuminata	S	*
From Botanic Gardens, B. Guiana.		
Attalea speciosa	S	
Maximiliana sp.	S	
Areca alba (?)	S	
Hippeastrum solandriflorum	P	*
Croton Rex	P	*
,, multicolor	P	*
,, picturatus	P	
,, rotundifolius	P	*
,, eburneus	P	
,, Goldii	P	*
Lucuma sp.	S	
Livistona rotundifolia	S	*
From Dodd's Botanical Station, Barbados.		
Sugar Cane Seeds	S	
From Botanic Gardens, St. Lucia.		
Rose plants (350)	P	*
Zephyranthes citrina	P	*
Furcroea gigantea	P	*

A.—P. Plants. S. Seeds. B.—* Succeeded. F. Failed.

APPENDIX I.—Continued.

LIST OF PLANTS AND SEEDS INTRODUCED DURING 1890.

Name.	A.	B.
From Botanic Gardens, Mauritius.		
Hyophorbe Verschaffeltii	S	*
Ravenala madagascariensis	S	*
Areca sapida	S	F
Kentia sp.	S	F
Dictyosperma alba	S	F
Deckenia nobilis	S	F
Caryota Rumphiana	S	F
Stevensonia grandifolia	S	*
Nephrospermum Van Houtteanum	S	F
From the Agri-Horticultural Society, Madras.		
Ruellia tuberosa	S	F
Pterospermum suberifolium	S	*
Bauhinia tomentosa	S	*
Barleria lupulina	S	*
Wrightia antidysenterica	S	F
Myroxylon toluiferum	S	F
Colvillea racemosa	S	F
Bauhinia purpurea	S	*
Albizzia amara	S	F
Inga dulcis	S	F
Sterculia foetida	S	F
Stercospermum chelonoides	S	F
Oreodoxa regia	S	F
Meyenia erecta	S	F
Asclepias curassavica	S	*
Butea frondosa	S	F
Peltophorum ferrugineum	S	F
Acacia sundra	S	F
Bauhinia acuminata	S	*
Poinciana pulcherrima		
From Botanic Gardens, Bombay.		
Chamærops Ritchiana	S	F
From Botanic Gardens, Bangalore.		
Mimusops Elengi	S	*
From Botanic Gardens, Port Darwin.†		
Pittosporum melanospermum	S	
Frenela intertropica	S	
Clerodendron floribundum	S	
Dolichandrone filiformis	S	
Utricularia Singeriana	S	F
Ipomœa alata	S	F
Grevillea heliosperma	S	
Gossypium flavifforum	S	
Psoralea tartarica	S	
Sowerbæa alliacea	S	
Trichosanthus Holtzei	S	
Metrosideros paradoxa	S	
Adansonia Gregorii	S	*
Cochlospermum heteronemum	S	
Erythrophlæum Laboucherii	S	
Eucalyptus miniata	S	
Acacia sp.	S	
Acacia auriculiformis	S	*

Name.	A.	B.
From Revd. E. Bassett Key, Jamaica.		
Smilax officinalis	P	*
From Thos. Christy Esq., London.		
Piper Cubeba	P	*
Pothos aurea	P	*
Panax Victoriæ	P	F
,, excelsa	P	*
Stephania hernandifolia	P	*
Phalænopsis—4 plants	P	*
From L. M. Mead Esq., Oviedo, Flo., U. S. A.		
Washingtonia robusta	S	*
Sabal mexicana ?	S	*
From L'Horticulture Internationale, Bruxelles.		
Begonia Mme. Hardy	P	
,, Mme. Lionet	P	
,, President de Bouremilles	P	
Vriesia Duvali	P	F
Passiflora triloba	P	F
Croton Alexander III	P	*
Anthurium Archiduc Josef	P	*
,, Reine des Belges	P	*
Schismatoglottis variegata	P	F
Phyllotænium Lindenii	P	*
Dianthera bullata	P	*
Labisia Malonana	P	*
Acalypha triumphans	P	F
Dieffenbachia magnifica	P	F
Aphelandra atrovirens	P	*
,, Macedoana	P	*
Heliconia aureo-striata	P	F
Alocasia Lindeni	P	F
,, Lucieniani	P	*
,, gigas	P	*
,, Margaritæ	P	F
,, Willenowvi	P	*
,, angustianum	P	F
Ærides affine	P	F
Vanda tricolor var.	P	F
Ærides odoratum	P	*
Vanda Batemanni	P	*
Oncidium ampliatum majus	P	*
Epidendrum sceptrum	P	*
Saccolabium Cambodgeanum	P	F
Phaius maculatus	P	F
Coelogyne fuliginosa	P	*
,, flacoida	P	*
Epidendrum ciliare	P	*
Maxillaria nigrescens	P	*
Cypripedium barbatum	P	*
,, Lawrenceanum	P	*
,, Sedeni	P	F
,, Harrisianum biflorum	P	*
,, Boxalli	P	*

A.—P. Plants. S. Seeds. B.—* Succeeded. F. Failed.

† Only recently received.

APPENDIX II.

INSECTS.

No.	Scientific Name.	Popular Name.
	LEPIDOPTERA.	**Butterflies and Moths.**
121	Actinote pellenea, Hubn. ..	
122	Ormiscodes speciosa, Cram.	
123	Taygetis echo, Cramer ...	Black Night.
124	Lymnas xarifa, Hew ? ...	Under-leaf.
125	Opsiphanes invirae, Hubn..	
126	Euptychia arnæa, Fabr. ..	Blue Coolie.
127	Sais eurimedia, Cram. ...	
128	Letis fusa, Guen. ...	
129	Pierella dracontis, Hubn. ..	Cravat.
130	Euptychia sosybius, Fabr..	
131	Sematura empedoclaria, Hubn.	
132	Euthisanotia timais, Cram.	
133	Amphonyx medor, Cram. ..	
134	Morpho peleides, Koll. ...	Emperor.
135	Eucides aliphera, Hubn. ...	
136	Mapeta xanthomelas, Walk.	
137	Ithomia patilla, Hew. ? ...	Blue transparent.
138	Pyrrhopyga sp. n. (?) ...	
139	Telegonus alardus, Stoll. ...	
140	Taygetis cleopatra, Feld....	Night.
141	Taygetis virgiliæ, Cram. ...	Night.
142	Cycnos ætolus, Cram. ...	
150	Hydrias sp. ? ...	
152	Syssisphinx molina, Cram. F	
153	Erebus odoratus, Clerck ...	
154	Papilio gargasus F. Hubn..	Cattle-heart.
155	Tmolus beon, Cramer ...	
156	Ageronia amphinome, Linn.	Cracker.
157	Prepona pylene, Hew. var.	
158	Papilio zenxis F, Lucas ...	Cattle-heart.
159	Papilio gargasus F. Hubn..	Cattle-heart.
160	Chærocampa tersa, Drury..	
161	Letis nycteis F, Guénée ...	
162	Eubagis mylitta, Cramer ...	
163	Callidryas sennæ F, Linn...	
164	Protoparce lucetius, Cr. ...	
165	Urania leilus, Linn. ...	Page.
166	Ithomia ? Drymo, Hubn var.	Blue transparent.
168	Morpho peleides Koll. var. corydon, Guénée	Emperor.
169	Caligo automedon, Cramer..	Reckits blue.
170	Eurybia sialimede, Hubn...	
171	Mechanitis Egaensis, Bates, var.	
172	Siderone isodora, Cram, var.	
173	Temenis Ariadne, Cram. ...	
174	Pithonides cerialis, Sepp,...	
175	Pseudolycœna marsyas, Clerk.	
178	Thysania Agrippina, Cr. ...	†
187	Nymphalis Orion ...	†
191	Pyrgus petius, Hubn. ...	
192	Nymphidium Lamis, Cr. ...	
193	Prepona demophon, L. ? ...	
194	Hypolimnas misippus, L....	6 continents.
196	Syrrhodia decrepitaria, W..	
197	Hypermaria sp. ...	
198	Thymele dorantes, Stoll. ...	
199	Thymele esmeralda, Butl..	
200	Œschropteryx tetragonaria, Gu.	
201	Notarcha sp. ...	
202	Carystus sp. n. (?) ..	
203	Hylesia sp. ...	
204	Bolina cunearis, Guen. ...	
205	Nepheloleuca politia, Cr. ...	
206	Antigonus nearchus, Lotr..	
207	Antichloris eriphia, Fab. ...	
208	Charidea (?) nivea, Herr, Shaff	
209	Histicea cepheus, Cram. ...	
210	Ephialtias sp. n. (?) ...	
211	Euptychia libye, L. ...	
212	Pythonides sp. n. (?) ...	
213	Pamphila epictetus, F. ...	
216	Spathilepia terranea, Butl.	
310	Attacus Bolivar ...	†
	COLEOPTERA.	**Beetles.**
143	Oncideres tessellata, Thoms.	
144	Steirastoma depressum, Linn.	Cacao Beetle.
145	Canthon sp. ...	Tumble-tud.
148	Coelomera cayennensis, Fabr.	
149	Macropus longimanus, Linn.	Harlequin Beetle.†
176	Ancistrosoma farinosum, Sallé	
178	Hydrophilus sp. ...	Water Beetle.
179	Calopteron serratum, Linn.	
180	Lachnosterna sp. near rugipennis, Sharp	
184	Dynastes Hercules ..	Horned Beetle.
199	Phanaeus festivus, Linn. ...	Tumble-tud. (small)
215	Photinus sp. ...	
217	Tauroma taurus, Fabr. ...	
218	Œgithus clavicornis, Linn..	
	HYMENOPTERA.	
146	Monedula punctata, Fabr..	Wasp.
147	Monedula surinamensis, De Geer	,,
149	Sphex ichneumonea, Linn..	,,
39	Xylocopa fimbriata, F. ...	
51	Epicharis rustica, Oliv. ...	
151	Eulæna cayenensis ...	Monkey orchid Bee.
71	Euglossa cordata, L. ...	
181	Atta fervens, Say. F. ...	Supposed Female Parasol Ant.
182	Œcodoma cephalotes ...	Parasol Ant.
214	Polistes sp. ...	
		Neuroptera.
72	Hetærius occisa, Hag. ...	Dragon fly.
219	Mecistogaster ornatus, Ramb	,,
	ORTHOPTERA.	**Locusts, &c.**
183	Scapteriscus didactylus ...	Mole Cricket.
185	Blaberus giganteus, Linn...	Drummer Cock-roach. †
186	Locusta cristata ...	†
	MYRIAPODA.	
	Arachnida.	**Spiders & Scorpions.**
309	Eurypelma versicolor, Walch	Tarantula *

* Not the same as the Tarantula of Europe.

† Not. B. M. determinations'

APPENDIX III.

METEOROLOGICAL RESULTS, TRINIDAD ROYAL BOTANIC GARDENS, FOR THE YEAR 1890.

Station 130 feet above Sea-level.

MONTH.	BAROMETER. Reduced Readings. 7 A.M.	BAROMETER. Reduced Readings. 3 P.M.	THERMOMETERS. Dry & Wet Bulbs. 7 A.M. D.	7 A.M. W.	3 P.M. D.	3 P.M. W.	Maximum.	Minimum.	Mean Temperature, Blackened Bulb in Vacuo.	Mean Temperature, Thermometer on Grass.	WIND. Direction.	Humidity.	Tension of Aqueous Vapour.	Rainfall.	Dew Point, 7 A.M.	Dew Point, 3 P.M.
	Bar.	Bar.	D.	W.	D.	W.										
	In.	In.	°	°	°	°	°	°	°	°		°		In.	°	°
January ...	29·970	29·929	71·0	69·8	81·3	74·9	84·3	68·8	143·6	...	E	80·	·720	7·76	68·9	70·5
February ...	29·979	29·934	68·2	66·8	81·4	73·2	85·1	66·0	147·8	65·3	E	78·	·661	0·51	65·7	67·6
March ...	29·988	29·933	70·4	68·8	82·1	73·1	86·2	67·5	149·5	67·0	E	75·	·661	2·09	67·5	67·0
April ...	29·999	29·950	73·6	71·3	79·8	74·4	84·4	70·0	142·1	69·1	E	80·	·746	7·62	69·0	70·7
May ...	30·017	29·961	71·7	70·3	82·2	75·5	85·9	69·5	145·0	67·9	E	79.	·733	5·14	69·2	71·0
June ...	30·045	29·980	74·7	72·8	81·9	74·8	85·5	70·0	143·4	68·1	E	77·	·746	9·68	71·4	70·0
July ...	30·038	29·992	73·6	71·8	81·1	75.6	86·3	68·6	145·9	66·6	E	80·	·759	12·89	70·4	71·8
August ...	29·993	29·936	74·8	73·0	82·2	76·7	86·3	68·9	146·2	65·8	E	82·	·798	11·65	71·7	73·0
September ...	29·968	29·891	74·1	72·3	83·7	76·6	89·0	70·4	150·2	68·4	E	80·	·772	3·37	70·9	71·9
October ...	29·987	29·927	73·8	72·3	81·1	75·9	86·8	70·6	148·0	65·6	E	82·	·772	10·98	71·2	72·3
November ...	29·960	29·909	73·3	70·8	83·3	76·5	87·7	70·1	147·3	64·3	E	78·	·746	5·93	68·9	71·9
December ...	29·960	29·910	70·0	69·7	82·9	75·2	85·9	68·1	144·1	63·0	E	80·	·720	5·28	69·5	70·0
Average for year ...	29·992	29·937	72·4	70·8	81·9	75·2	86·1	69·0	146·0	66·4	E	79·	·736	6·90	69·5	70·6
Mean daily height of Barometer	29·964 inches.				Mean Annual Temperature		77·5							Total Rainfall	82·90 inches.	

APPENDIX III.—Continued.

RAINFALL FOR THE ISLAND OF TRINIDAD FOR THE YEAR ENDING 31ST DECEMBER, 1890.

No. of Station.	STATION.	Diameter of Gauge, Govt. or Private.	January.	Feby	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	Total.
1	St. Anne's—Royal Botanic Gardens ...	8 G.	7·76	0·51	2·09	7·62	5·14	0·68	12·89	11·65	3·37	10·98	5·93	5·28	82·90
52	Port-of-Spain—Police Station ...	8 G.	6·98	0·26	2·46	6·19	5·39	10·64	14·27	10·71	3·44	6·42	5·26	2·00	74·02
54	Royal Gaol ...	8 G.	6·82	1·06	1·43	2·53	3·21	10·59	8·54	6·60	6·48	5·34	9·43	3·64	65·66
4	St. Joseph—Warden's Office ...	5 G.	...	0·74	2·41	8·69	7·59	9·23	11·03	14·20	2·62	8·27	5·08	2·82	...
5	St. Joseph—Police Station ...	5 G.	9·85	0·71	2·42	8·74	8·14	10·02	11·48	14·73	3·58	8·44	4·49	2·97	85·57
6	Tunapuna Village—Macoya Estate ...	5 G.	8·83	1·07	1·53	8·27	6·90	10·52	9·02	14·01	2·94	8·74	2·97	1·97	76·77
44	Aroma—Bon Air ...	8 G.	12·11	0·66	2·56	11·29	8·76	12·49	10·52	17·77	4·86	10·94	3·71	2·91	99·68
9	Cumuto—Santa Teresa ...	5 G.	21·42	1·60	5·40	19·81	9·81	20·31	11·58	19·21	6·06	14·86	5·37	7·62	143·07
49	Arima—Garden Estate ...	5 G.	12·75	1·09	2·87	11·05	9·19	13·23	9·23	18·64	3·39	9·92	3·11	5·09	99·06
7	Arima ...	5 G.	13·47	0·61	2·74	12·07	10·26	12·90	8·69	14·91	4·90	1·14	4·02	3·41	99·81
11	Toco—La Sagesse ...	5 G.	15·11	0·83	3·58	16·62	6·20	10·33	5·38	11·40	6·92	14·14	0·95	3·94	95·60
10	Toco—Police Station ...	5 G.	17·47	1·02	4·34	18·62	7·74	12·36	6·04	12·80	6·48	15·75	1·84	4·20	108·86
14	Cuva—Exchange Village ...	5 G.	10·88	0·38	2·47	9·42	6·96	9·00	5·54	10·92	1·30	4·95	2·94	1·37	66·13
15	Cuva—Police Station ...	5 G.	10·79	0·74	3·03	8·06	7·16	7·05	6·38	10·84	1·79	6·16	4·33	2·10	85·33
19	Montserrat—Tortuga Estate ...	8 G.	14·42	1·01	4·72	13·27	10·34	12·86	10·77	14·59	2·28	9·95	5·80	4·60	104·61
18	Montserrat—Police Station ...	5 G.	13·83	0·85	4·12	13·41	8·55	13·06	11·84	13·87	2·63	9·88	2·88	4·52	99·44
25	Oropuche—Police Station ...	5 G.	12·38	3·23	6·52	13·60	4·80	13·03	11·19	12·22	4·38	9·35	6·48	5·06	...
26	Savana Grande—North ...	5 G.	16·50	1·68	6·81	17·48	5·34	13·82	10·61	14·74	4·20	10·64	7·85	6·31	115·98
27	Cedros—Police Station ...	5 G.	13·22	2·21	7·65	7·24	8·15	11·81	9·29	8·83	3·64	8·09	4·93	5·49	89·95
60	Cedros—Columbia (C.W.) ...	... P.	15·76	2·31	5·84	10·05	6·75	12·65	9·65	6·75	3·87	6·15	3·43	4·70	87·91
72	St. Marie Estate—Cedros ...	5 P.	14·27	3·67	6·55	8·29	8·97	12·71	10·86	9·88	4·39	9·11	6·28	5·78	100·66
73	La Retrait Estate—Cedros ...	5 P.	16·10	1·93	6·10	11·45	12·95	15·51	11·25	8·42	11·96	17·05	5·47	5·25	123·34
2	Tucker's Valley ...	5 G.	10·26	0·81	...	6·82	4·68	10·87	9·52	10·11	6·20	11·76	1·08	5·13	...
21	Princes Town—Malgretoute ...	5	...	...	...	...	...	...	...	...	...	...	...	...	...
22	Princes Town—Police Station ...	5 G.	22·00	1·69	5·16	13·23	5·83	10·13	9·08	12·28	3·89	7·39	7·01	6·39	104·08
48	Princes Town—Lengua, Los Naranjas	8	13·28	1·10	7·57	6·27	12·55	8·10	7·39	9·34	5·39	4·37	7·06	4·57	101·99
16	Claxton's Bay—Mt. Pleasant Estate ...	5 P.	12·22	0·30	3·49	10·76	5·08	9·57	9·71	7·47	1·80	5·81	5·32	2·26	73·77
31	Mayaro—St. Joseph Estate ...	5 G.	18·29	2·18	2·08	19·97	4·96	8·95	5·35	16·40	3·94	5·86	4·36	3·18	95·52
32	Mayaro—Police Station ...	5 G.	20·81	2·72	4·52	18·71	11·26	11·95	7·03	16·03	8·81	12·05	7·20	6·53	117·12
12	Chaguanas—Police Station ...	5 G.	11·95	1·48	3·82	9·83	2·99	12·93	9·14	12·42	4·09	8·04	6·45	2·04	93·18
13	Chaguanas—Perseverance Estate ...	5 G.	...	...	...	...	...	...	...	...	...	...	...	...	...
50	Chaguanas—Convict Depôt ...	8 G.	15·05	0·43	4·08	10·32	8·30	13·67	8·45	12·57	3·69	10·20	6·08	1·59	93·28
61	Chaguanas—Petersfield (D.S.P.) ...	... P.	12·94	0·00	3·88	11·56	8·19	15·52	10·32	13·08	2·39	7·99	6·44	1·90	...
8	Tunapuna—Police Station ...	... G.	16·27	0·60	3·92	12·21	9·91	17·29	12·85	17·09	4·38	14·22	3·85	4·68	116·77
28	Erin—La Ressource Estate ...	5 G.	14·24	6·34	6·01	11·97	5·67	9·35	7·53	7·57	2·66	8·18	4·25	4·79	88·66
46	Erin—Chatham ...	8 G.	12·63	5·32	7·22	13·62	9·73	10·95	10·66	10·45	5·29	14·01	13·39	8·90	122·07
29	Moruga—Police Station ...	8 G.	9·44	2·87	6·37	10·32	7·05	15·61	10·36	11·85	4·14	13·50	8·93	8·88	109·32
30	Moruga Road—Rest House ...	8 G.	17·36	2·24	5·69	15·45	10·08	15·73	11·26	12·68	8·65	12·67	8·49	5·96	126·17
23	Gasparil—Preventive Station ...	5 G.	7·41	0·26	1·59	3·44	3·90	6·92	7·71	5·63	5·07	7·85	2·54	...	...
33	St. Juan—El Socorro Estate (R.S.) ...	... P.	8·71	0·23	2·35	11·48	7·36	10·65	12·31	10·43	3·26	8·63	9·36	2·73	...
34	Naparima—Harmony Hall Est. (H.E.) ...	... P.	12·02	1·54	4·00	11·36	4·54	11·27	9·08	11·54	2·97	6·58	5·29	5·68	86·02
35	Naparima—Tarouba Estate (T.E.) ...	... P.	12·15	1·45	4·65	11·98	4·05	11·43	5·61	10·93	1·96	5·89	6·27	3·69	80·06
36	Naparima—Williamsville Est. (W.V.) ...	5 P.	13·58	1·73	4·63	15·01	5·67	10·70	8·67	14·04	3·84	7·13	7·45	4·07	96·42
37	Naparima—Concord Estate (C.C.) ...	... P.	10·90	0·90	3·67	13·17	3·80	12·40	8·00	13·25	4·26	7·85	8·65	5·90	...
38	Naparima—Union Hall Estate (N.) ...	... P.	9·61	1·00	3·84	12·07	4·79	13·12	9·92	13·76	3·80	8·28	6·30	5·01	...
39	Naparima—Petit Morne Estate (P.M.) ...	... P.	10·47	1·46	3·93	8·05	6·26	11·90	8·29	14·20	4·63	7·10	6·45	4·32	87·04
40	Naparima—Golconda Estate (G.C.) ...	... P.	12·97	2·15	4·38	10·65	4·48	15·33	10·84	12·59	4·24	7·88	7·32	4·85	98·16
41	Naparima—Cedar Hill Estate (C.H.) ...	5 P.	14·53	1·91	4·69	11·68	5·64	12·24	8·84	13·54	4·60	7·83	6·66	4·75	97·26

APPENDIX III.—Continued.

RAINFALL FOR THE ISLAND OF TRINIDAD FOR THE YEAR ENDING 31ST DECEMBER, 1890.—CONTINUED.

No. of Station.	STATION.	Diameter of Gauge, Govt. or Private.	January.	Feby.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	Total.
42	Naparima—St. Madelène Usine (U.S.M.)	... P.	11·58	1·68	4·28	9·28	5·47	12·27	8·37	14·60	4·92	7·46	5·63	4·02	...
59	Naparima—Plein Palais (P.P.)	... P.	10·33	1·74	4·85	11·24	2·56	11·23	8·69	11·84	2·85	5·30	4·87	4·75	80·25
45	Naparima—Wellington Estate	... 8 G.	11·10	2·00	3·80	8·57	5·18	13·12	9·60	10·84	4·44	7·95	4·50	3·85	84·93
56	Naparima—Craignish Estate	... 5 P.	12·97	1·00	4·53	14·75	5·18	11·90	7·99	15·39	3·43	7·96	7·09	5·84	98·03
17	San Fernando—Ellerslie House	... 5 G.	10·00	1·01	4·53	10·15	3·79	11·12	7·17	13·01	2·59	7·05	4·87	4·03	79·32
47	San Fernando—Lewisville	... 8 G.	11·28	1·60	5·51	11·62	4·36	12·65	8·25	13·62	3·46	6·88	6·41	5·20	90·84
75	Maraval—Val-de-Oro	... 8 G.	12·59	0·75	3·85	9·90	8·20	9·18	11·45	15·70	5·57	14·90	2·70	3·94	98·73
51	Maraval—Police Station	... 8 G.	10·71	0·34	2·77	8·93	6·31	10·70	10·22	14·04	4·05	12·79	2·26	4·42	87·54
53	Diego Martin—Police Station	... 8 G.	9·87	0·54	1·14	7·44	5·76	9·56	11·96	13·27	6·53	12·38	2·85	5·06	86·36
54	Maracas Bay	... 8 G.	15·93	1·72	3·43	12·49	9·64	15·73	15·34	20·84	7·01	13·79	4·55	4·36	124·81
55	Maracas—Government School	... 8 G.	9·06	...	2·45	9·65	8·90	8·38	10·76	8·64	3·97	9·80	3·28	5·91	...
57	Blanchisseuse	... 8 G.	19·55	1·89	5·57	12·93	9·09	11·93	9·99	12·25	5·41	9·15	2·23	5·43	105·37
58	Cap-de-Ville	... 8 G.	20·03	5·08	13·03	13·28	14·86	14·38	14·70	13·35	15·03	23·00	15·52	11·85	174·11
62	Valencia	... 8 G.	22·95	3·50	4·15	14·23	14·72	17·88	10·35	14·52	9·77	20·41	5·21	4·87	142·56
63	La Brea	... 8 G.	10·74	0·73	3·21	8·43	3·61	9·86	13·34	16·31	5·52	12·00	4·43	3·59	91·77
65	Carapichaima	... 8 G.	9·74	1·41	4·13	8·83	7·57	9·34	7·42	13·96	2·87	7·11	3·87	3·57	79·28
66	Nariva—The Cocal	... 8 G.	18·19	2·52	5·50	18·93	6·86	8·85	3·74	14·35	5·30	11·73	3·26	10·49	109·72
68	Manzanilla—Police Station	... 8 G.	20·58	2·74	5·70	21·37	6·27	14·23	6·07	14·89	8·79	15·80	3·36	7·37	127·17
3	Santa Cruz—Police Station	... 8 G.	11·98	0·40	2·05	10·61	7·40	9·39	12·36	16·91	3·36	12·80	3·08	3·94	94·28
69	Brechin Castle	... 5 G.	11·54	1·23	3·78	13·13	7·66	11·34	7·62	11·04	1·96	7·47	4·88	2·85	84·50
70	Rivulet Estate	... 5 P.	12·30	0·96	3·53	10·30	7·96	11·62	8·28	9·88	1·81	6·30	3·38	2·71	...
71	St. Helena Estate	... 5 G.	18.06	0·22	2·41	14·79	...	21·67	12·25	11·64	3·52	10·19	2·76	3·25	...
74	La Plaisance Estate	... 5 G.	11·07	1·73	3·51	11·73	3·92	12·56	7·38	14·49	3·69	9·19	6·93	4·25	90·45
76	Curepe	... 5 G.	9·70	0·96	2·00	11·45	7·54	12·58	10·33	12·90	2·16	9·02	3·77	2·38	...
77	McLeod Plain	... 5 G.	9·08	0·67	2·47	8·38	6·01	12·85	10·46	14·70	1·89	9·51	2·58	3·12	...
78	Caroni	... 5 G.	10·25	2·32	2·52	8·36	6·81	13·72	11·91	15·90	3·53	10·32	3·69	1·73	91·06
79	Beaulieu Estate—Cedros	... ... G.	11·76	3·58	5·66	8·54	6·23	10·29	7·65	6·01	3·74	6·61	4·22	4·73	79·02
80	Siparia—Police Station	... ... G.	13·49	6·40	6·06	16·12	7·10	15·82	14·68	11·78	7·45	16·08	7·15	6·45	128·58
81	Gran Couva	... ... G.	14·07	1·47	4·96	16·39	7·03	14·09	10·06	16·13	2·82	11·18	3·83	4·17	105·70
82	Tacarigua—El Dorado Estate.	... 5 P.	9·05	0·89	2·05	10·10	7·74	11·00	10·53	16·46	3·01	10·34	3·12	2·46	86·75
83	Carenage—Police Station	... 8 G.	9·67	0·13	2·77	5·72	6·05	7·97	12·60	12·75	5·41	14·13	3·76	4·42	86·38
84	Guapo—Adventure Estate	... 8 G.	...	2·27	4·89	8·20	5·95	9·45	8·94	9·82	7·06	11·96	5·77	6·07	...
85	Fairfield Estate	... 8 G.	13·03	0·62	4·25	15·03	5·50	11·87	8·55	15·00	3·40	7·98	7·37	4·65	97·25
86	Lothians—Princes Town	... 8 G.	16·28	1·54	4·71	15·91	5·43	12·62	9·58	12·72	4·70	8·45	7·91	5·62	...
24	Maraval Reservoir	... 8 G.	10·85	0·18	2·69	8·51	7·54	10·82	11·51	12·97	5·85	15·03	2·63	6·03	94·61
67	St. Ann's Reservoir	... 8 G.	...	0·31	3·05	7·46	5·60	9·26	9·75	10·68	2·02	9·85	4·05	4·14	...
87	Oropuche—Nelson Estate	... 5	...	...	...	13·31	4·50	13·09	11·95	15·71	5·47	12·77	5·63	5·50	...
88	Cedros—Perseverance Estate	... 8 G.	...	...	...	...	8·61	12·98	8·71	7·15	3·66	8·82	5·73	5·51	...
89	Savonetta—Phœnix Park Estate	... 8 G.	...	...	...	...	4·98	11·18	9·87	10·41	2.01	7·07	6·12	3·41	...
90	La Gloria Estate	... 8 G.	...	...	...	...	...	...	10·63	16·95	2·31	...	...	4·25	...
91	Dabadie	... 8 G.	...	...	...	...	...	...	9·42	19·41	7·95	15·15	5·00	7·27	...
92	Cunupia—Mon Plaisir Estate	... ...	...	...	...	...	...	...	5·81	11·35	2·07	10·17	2·66	2·16	...
93	Arouca—Laurel Hill Estate	... ...	9·65	1·10	1·81	11·05	7·60	14·73	11·09	16·25	3·60	10·95	3·80	2·50	94·13
43	Hicacos—Constance Estate	... ...	13·00	2·13	7·04	6·11	6·93	10·39	9·42	8·58	3·35	8·45	3·40	3·44	82·24
21	Sangré Grande (Sta. Estella Estate)	... 8 G.	...	...	6·06	20·45	8·16	12·86	8·51	15·98	9·04	17·15	5·23	8·06	...
	Monthly Average, and Mean for year*	...													

67) 656588
98.00

APPENDIX III.—Continued.

TRINIDAD—ROYAL BOTANIC GARDENS.

ANNUAL RAINFALL, 1862 TO 1890, INCLUSIVE.

Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total Rainfall in each year in Inches.	Decennial periods.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.		
1862 ...	...	·66	·77	·25	1·41	8·47	10·36	9·57	11·97	6·60	10·06	3·03	63·15	In the decennial period 6 years above and 4 years below 25 years average.
1863 ...	1·54	2·71	1·45	·85	1·26	9·12	10·12	10·53	12·11	6·24	4·30	6·57	66·80	
1864 ...	2·51	·53	·36	·04	8·15	4·96	7·17	12·06	8·04	6·53	5·94	6·61	62·90	
1865 ...	2·62	3·20	1·07	7·98	3·22	5·64	10·35	14·83	7·32	14·62	4·81	9·62	85·28	
1866 ...	2·24	3·91	1·44	1·09	1·45	6·59	7·83	12·34	5·87	10·11	8·17	6·82	67·86	
1867 ...	1·31	6·36	·83	1·32	2·33	5·30	12·20	15·21	10·45	7·87	·67	2·71	66·56	
1868 ...	2·06	·82	3·20	·64	4·17	7·78	11·35	6·73	5·46	4·66	8·31	1·03	56·21	
1869 ...	·08	·93	·74	·41	·69	5·52	10·17	8·74	8·86	5·15	6·30	5·87	53·46	
1870 ...	2·61	·56	1·46	1·51	4·65	8·81	11·91	9·00	10·63	3·98	5·94	8·29	69·35	
1871 ...	6·62	1·40	2·89	·92	3·97	8·84	11·73	12·97	7·87	4·37	10·73	3·27	75·58	
1872 ...	1·45	·07	·74	·39	3·14	7·09	5·45	10·82	3·07	4·80	9·89	3·04	49·95	In the decennial period 6 years above and 4 years below 25 years average.
1873 ...	1·78	1·08	1·98	·53	...	4·31	5·04	8·37	5·80	10·34	3·48	1·31	44·02	
1874 ...	3·47	1·96	3·67	5·16	2·51	12·28	12·28	11·20	9·38	6·42	3·66	4·29	76·28	
1875 ...	3·39	·91	·56	·42	2·61	4·15	12·62	7·22	11·95	10·85	3·74	2·48	60·90	
1876 ...	3·26	1·03	1·78	1·67	6·65	11·17	12·23	15·18	12·03	7·04	5·95	3·96	81·95	
1877 ...	2·14	...	7·46	3·38	3·19	8·43	8·35	12·94	6·39	6·68	7·66	5·48	72·10	
1878 ...	3·44	·70	...	3·22	4·99	5·78	5·42	8·88	11·15	5·89	8·72	3·05	61·24	
1879 ...	1·52	2·76	4·56	3·03	3·08	14·92	6·86	10·35	6·15	3·54	4·28	4·38	65·43	
1880 ...	11·72	6·53	·67	2·32	3·90	7·83	6·30	17·39	7·47	5·74	10·51	1·96	82·34	
1881 ...	·57	·65	·23	1·60	4·66	11·05	7·82	10·90	10·59	3·36	12·06	2·23	65·72	
1882 ...	1·33	2·38	·73	1·57	3·74	6·33	5·93	8·40	4·93	5·86	10·29	1·50	52·99	In quinquennial period 2 years above and 3 below 25 years average.
1883 ...	1·56	·71	·26	3·37	5·89	10·91	13·66	10·26	5·53	3·99	6·06	8·30	70·50	
1884 ...	3·43	2·50	4·40	1·51	2·91	6·84	5·71	8·70	5·03	5·05	5·14	5·66	56·88	
1885 ...	1·30	·89	1·49	·43	5·27	3·44	5·87	4·56	6·08	4·08	5·37	4·44	43·22	
1886 ...	3·32	1·97	3·27	3·83	4·49	9·70	17·48	8·15	6·73	12·59	8·54	6·75	86·82	
Avg. Monthly Rainfall, 1862 to 1886.	2·61	1·81	1·84	1·90	3·53	7·81	9·37	10·61	8·03	6·65	6·82	4·51		
1887 ...	2·69	1·46	1·67	1·08	3·98	7·40	5·51	9·93	5·07	5·84	7·60	11·86	64·09	below avg.
1888 ...	8·37	1·79	2·41	2·28	3·46	11·92	6·89	7·02	5·53	5·06	7·76	2·95	65·44	,,
1889 ...	0·94	0·85	4·16	1·05	6·34	11·66	12·14	11·73	3·76	6·30	7·38	7·48	73·79	above avg.
1890 ...	7·76	0·51	2·09	7·62	5·14	9·68	12·89	11·65	3·37	10·98	5·93	5·28	82·90	,,

Average Annual Rainfall for 25 years—1862 to 1886 = 65·49 inches.
Rainfall for 1890 is more than the average by 17·41 inches.

J. H. HART, F.L.S,
Superintendent Botanical Department.

TRINIDAD.

No. 48.

BOTANIC GARDENS.

REPORT on Botanic Garden's Department for 1890.

LEGISLATIVE COUNCIL.

4th May, 1891.

THE GOVERNMENT PRINTING OFFICE.