

No. 511.

REPORT ON THE BOTANICAL AND FORESTRY DEPARTMENT, FOR THE YEAR 1905.

*To be laid before the Legislative Council by Command of
His Excellency the Governor.*

GARDENS AND GROUNDS.

Botanic Gardens.—The year was, comparatively speaking, free from serious damage done by typhoons. In August a few trees were blown down and a number of rose bushes destroyed which have now been replaced. During the typhoon season much time was taken up by the staff in making preparations to minimise damage as much as possible. Often the work, such as the moving of pot plants into sheltered positions, proved unnecessary, but it is more economical to move them ten times than to leave them once and have them blown to pieces. It is hoped, however, that when the office is connected with the telephone system a lot of this work will be unnecessary. The rainfall is tabulated in Table I.

Minor repairs have been done to both sand and concrete walks. Many of the Bamboos forming the roofs of the plant-houses have had to be renewed. These were originally fixed from six to eight years ago. The plant-houses in the Pot Nursery underwent considerable repairs, the woodwork in many places having become rotten.

A great feature at the fountain last Summer was the splendid show of *Eichhornia speciosa* when in flower. This plant was only introduced 3 years ago by Lady BLAKE but it is now to be found in gardens all over the Colony. An interesting conifer in the New Garden has recently flowered for the first time. This is *Libocedrus macrolepis*, the seed of which was sown in December, 1900, having been presented to the Gardens by Messrs J. Veitch & Sons' collector, who found it in Yunnan. The tree is now about 8 feet high. Other young trees raised from the same seed and planted in Mountain Lodge Grounds have long since been blown to pieces. One of the most interesting flowering trees in the Gardens is an unnamed *Bauhinia* growing near the deer pen in the New Garden. The original tree from which it sprang is still growing on the hillside at Pokfulam close to the remains of an old house, by the tenants of which it had presumably been introduced from abroad. So far as we have been able to ascertain it is unmatched in the Kew Herbarium. It comes into flower in September and remains in good condition for nearly five months.

In September bulbs of *Allium neapolitanum* were received from Mr. W. H. WALLACE, Amoy, some of which were planted in pots in the Gardens and the remainder in the rockery at Mountain Lodge. A few of those at the Peak flowered splendidly but those down below absolutely refused to grow. At Amoy these and many other bulbs do remarkably well, but, from some cause or other which it is difficult to fathom, it is impossible to grow them in Hongkong.

The chief recipients of plants and seeds were:—

Arnold Arboretum (Boston); Assistant Superintendent, Victoria Gaol; Messrs. BARR & SONS (London); Botanic Gardens of Calcutta, Kew, Natal and Singapore; Messrs. BUTTERFIELD & SWIRE; Captain Superintendent of Police; Civil Service Club; Dr. CLARKE; Colonel BIRDWOOD (Tonbridge); Mr. R. H. C. CRAWFORD (Nassau); Forestry Bureau (Manila); Miss F. GROTEFEND (Berlin Foundling House); Mr. T. HANMER; Major-General VILLIERS HATTON; Imperial Scientific College (Tokio); Miss JOHNSTONE; His Honour J. H. STEWART LOCKHART (Wei-hai-wei); Miss J. MULLERY; Museum of Natural History (Paris); Police Recreation Club; Police Stations at Bay View, Ping Shan, Sheung Shui and Tai O; Parks and Open Spaces (Shanghai); Miss JOHANNE REINECKE; Southern California Acclimatizing Association; Mrs. SWAN; Messrs. TANG LING TONG and Mr. W. H. WALLACE (Amoy).

The chief *donors of plants* and seeds were :—

Arnold Arboretum ; Mr. A. BABINGTON ; Messrs. BLACKHEAD & Co. ; Lady BLAKE (Ceylon) ; Botanic Gardens of Calcutta, Ceylon, Durban (Natal), French Congo, Jamaica, Singapore and Trinidad ; Mr. CHOA LUP CHEE ; Deputy Commissioner of Forests, Chittagong ; Forestry Bureau, Manila ; Rev. B. GREISER ; Captain HODGINS ; Parks and Open Spaces, Shanghai ; Captain MARCHANT ; Imperial Botanical Museum, Berlin ; Sir FRANCIS PIGGOTT ; Reporter on Economic Products to the Government of India ; Mr. A. ROBERTSON-PROSCHOWSKY ; South California Acclimatizing Association ; State Gardens, Baroda ; Mrs. BASIL TAYLOR ; United States Department of Agriculture ; Mr. W. H. WALLACE ; Mr. J. WESTLAND, (Ceylon).

Government House Grounds.—These grounds, including the walks, have been kept up to their usual condition. Towards the end of the year the tennis lawn was attacked by caterpillars which were kept in check by an application of Jeye's Fluid and water in the proportion of one of the former to ninety of the latter. In the small compound behind the stables which was formerly used for growing decorative plants, new coolie quarters have been erected, thus necessitating the removal of the plants elsewhere.

Mountain Lodge Grounds.—The shrubberies were overhauled and planted up as required. These always want a lot of attention in the Spring of the year owing to the great damage done by wind even in the most favourable Summers. In the August typhoon the creeper covering the large retaining wall was completely blown down, thus exposing the whole of the unsightly masonry. Wires fixed to iron stays have been put up so that it is hoped that when the *Ficus* has grown, in two or three years, the wind will not be able to do so much damage in this direction. The steepest parts of the walk round the hill on the south side of the grounds were concreted, and cement channels made to carry off the rainfall.

Protestant Cemetery.—The usual routine work was maintained throughout the year. During the winter months, at the beginning and end of the year, a great deal of damage was done to annuals by deer. The herbage obtainable on the hillsides at this season is less succulent than at other times and it is on this account that these animals come into the Cemetery to feed on the tender plants growing there. The roofs and stages of the plant-houses which had become decayed have been renewed by the Public Works Department. The matsheds also which are used for storing dry soil and for raising plants from seed have been re-built.

Blake Garden.—A few more trees, shrubs and creepers were planted in the Spring. Most of the plants and trees put in 1904 have grown well. A summer-house subscribed for by a few of the Chinese residents in the neighbourhood has been erected on the mound at the north-west corner of the Garden. The Garden appears to be more and more appreciated by the Chinese.

Peak Garden.—The vote of \$700 allowed for the formation of this small Garden was expended during the year but the ground has not been turfed yet, as the work was not sufficiently advanced at the end of the rainy season to permit of this being done. A pump has been fixed to the well in the Garden by the Public Works Department. This will permit of the well being covered over so that there will be no danger of children falling in, and at the same time the water will be available for the garden.

Sokunpo Nursery.—As the Nursery is unfenced, wild deer, as in the Protestant Cemetery, did a lot of damage to the seedlings ; pigs were also a source of trouble. A portion was enclosed with a wire-netting fence, 3 feet high, but this was only partly effectual in keeping the deer out as they occasionally jumped over it. Small lamps, however, fixed so that they would sway about in the wild during the night had very satisfactory results.

Albany Nursery.—The whole of the Albany Nursery is gradually being brought into use as funds permit. A part of it is occupied by decorative plants, the stock of which has had to be largely increased owing to the frequency with which they are now required for various decorative purposes. Carrying the plants to and from the places where they are being used, insufficient water whilst they are in the rooms and the frequent breakage of pots causing damage to the roots and necessitating re-potting, render it necessary to keep many more plants than are actually required at any one time. A number of trees and economic plants have been put in another part of this nursery.

West End Park.—A number of men have been employed at various times throughout the year in cutting grass, pulling up weeds and keeping the place generally in a fair condition.

Government Officers' Grounds.—These have been kept in good order throughout the year. In continuation of the previous year's work bare patches under trees have been covered with "blue grass".

Roadside Rockeries.—The numerous rockeries in various parts of the town have received attention from time to time. In the Glenealy rockeries a lot of re-planting was done in the Spring.

A list is appended (Table II) of the various Gardens, Parks, Rockeries, etc., for which the department is wholly or partly responsible.

HERBARIUM.

The routine work of the Herbarium consists in keeping the collections dry and free from insects, and the mounting, poisoning and sorting of new specimens. These duties were satisfactorily done by the two Chinese Assistants during the year. Little time could be given by the European staff to botany, and the collection of about 3,000 specimens brought by the Superintendent from Fokien still remains in the boxes in which it arrived. During the year another and larger collection (from Central and Western China) was acquired. The utilization of these collections as well as the identification of a collection of economic products for the Imperial Institute remained on hand at the end of the year. It is, however, hoped that time will be found to clear off these arrears of work in 1906.

The chief recipients of Herbarium specimens were:—

The Arnold Arboretum; Botanic Gardens at Calcutta, Kew, Manila and Singapore; British Museum; Professor MARTELLI (Italy); Parks and Open Spaces, Shanghai.

The chief donor of Herbarium specimens was:—

The Imperial Botanical Museum, Berlin.

BOTANICAL INVESTIGATIONS.

Expedition to Central Fokien.

At the end of April a well-equipped expedition was sent by the Government in charge of the Superintendent to investigate the botanical resources of the Province of Fokien. Four trained Chinese collectors were taken. Foochow was reached on the 25th of April and a houseboat taken at once for the exploration of the more easily navigable parts of the Yuen Fu and Min Rivers. As the Hongkong Herbarium was almost devoid of specimens from Fokien and as our knowledge of the flora of that Province is very meagre it was necessary to collect specimens of every species, even down to the weeds of the cultivated fields. This collecting was at once begun on the plains and foothills of the ranges surrounding Foochow, and in 3 days about 300 species were collected. The houseboat formed a convenient base for drying and sorting the specimens. On the 29th of April the first rapids were reached, about 35 miles up the Yuen Fu. There is a good deal of virgin forest above 700 feet on the mountains which at this point begin to close in on the river. The finest forest that was seen was that surrounding the Monastery of Fong Kong Tse. The enormous trees of Liquidambar, Maple, Oak and Pine which grew there sheltered a rich flora, and a large number of additional species were collected on the damp rocks and along the mossy rivulets. On the 30th a return was commenced downstream and Foochow was reached again on May 2nd. The chief cultivations on the banks of the Yuen Fu are Lichee, Water Plum (*Myrica rubra*), Opium, Wheat, Oats, Paddy and Rape. In the steep gorges bamboo is extensively grown. Full notes were made on the cultivation and manipulation of these crops, especially on the extraordinarily ingenious methods of transporting the bamboos from the mountains.

A start was made on May 2nd up the Min River, and by the 7th Shui Kau, the highest point navigable for houseboats, was reached. The flora of the banks and neighbouring hills though very beautiful presented little that was new. Tea-oil cultivation was seen for the first time covering the dry hills at Shui Kau. As an experiment is being made with a view to introducing this industry into the New Territory, the conditions were carefully noted.

A transfer had now to be made to a rapid-boat and interesting though slow progress was made up the almost continuous series of rapids to Yenping. About 200 species from the banks of the Min were added to the 500 collected on the Yuen Fu, and the opportunity was taken of sorting and writing a key to the species as a guide to further collecting.

Yenping lies at the junction of the Kienning River with the Min nearly in the centre of the Province and is cut off from the north by a high range of mountains. These mountains are intersected by numerous forest-clad valleys, and it was determined to make a thorough exploration of one of these and of the summits with one collector, sending two further up the Min and leaving one at Yenping to dry the collections. The important work of drying the plants already collected and of those now constantly sent down from the mountains was greatly facilitated by the kindness of some Missionaries in Yenping who lent a room for the purpose. The Superintendent with one collector stayed at the small Chinese village of Buong Kang, about 12 miles from the town, and made an exhaustive collection of the flora of the romantic gorge in which it was situated as well as of the grassy downs at the summit. Both wood-oil and paper are made at this village and the excellent opportunity of obtaining full details of their manufacture was not neglected. Several points which had been obscure or misunderstood in these industries were fortunately able to be cleared up. A full description of these and other interesting results of the expedition are given below. Buong Kang was left and a return made to Yenping after a stay of three weeks. The number of additional species collected there was about 600.

A few days were spent in collecting at Yenping while waiting for the return of the two collectors from the Upper Min. Upon their return a rapid-boat was secured and the collections taken back with all possible speed to Foochow and Hongkong which was reached on the 24th of June.

Wood-oil.—Wood-oil is abundantly produced in the Province of Fokien and is one of the chief products brought down the Min from the western part of the Province. At Buong Kang, near Yenping, there is a large plantation of wood-oil trees, and as three weeks were spent there during the recent investigation of the flora of Fokien, the opportunity was taken to ascertain as much as possible as to the industry. The trees were of two kinds locally known as Hwa Tung (花桐) and Guong Tung (光桐). The names refer to the distinguishing character of the fruit which is sculptured in the first, smooth in the second. The trees were in flower and were easily recognised as *Aleurites cordata* and another species of the same genus which has been in cultivation in the Hongkong Botanic Gardens for many years but has not yet received a name. I understand from Mr. HEMSLEY, Keeper of the Kew Herbarium, that it is undescribed and that he has it in hand at Kew. The Hwa Tung (*Aleurites cordata*) is the most valued because all the flowers of the majority of trees produce fruits, from which the oil is made, while in the second kind a few flowers only in each cluster are perfect, quite 80 per cent. being male flowers. Why this kind is planted at all I was unable to discover. The trees are raised from seed and planted out when about three years old. They arrive at bearing in 5 or 6 years. The nuts are gathered when ripe, pounded up and placed in the usual Chinese oil presses. The pressure is applied by wedges, and the oil is collected and taken to market in a crude state.

It does not appear to have been suspected before that wood-oil was a mixture of the products of two species. A sample of seeds of the new Guong Tung have been secured for trial at the Imperial Institute, and if they yield oil superior in quality to the wood-oil of commerce the tree will be tried in the New Territory.

Bamboo Paper.—This is the usual paper used by the Chinese for wrapping up parcels and is produced and sold in very large quantities in many parts of Southern China. The manufacture was investigated at Buong Kang where a flourishing paper mill exists. The bamboo called Ma Deuk (麻竹) is the variety used. This is a bamboo (*Phyllostachys*, sp.) 20-50 ft. high, having a downy stem when young. It is cut into convenient lengths and laid in concrete tanks of water for about 4 months. After that period the material is carefully removed by hand as it becomes ready and is pulped in a water mill. These mills,

which are used for all kinds of pounding, consist of an overshot wheel about 10 feet in diameter. The axle carries a wooden cam which alternately raises and releases the pounder. The pulp is subsequently taken into the factory as a fibrous mass, the fragments being about 1 inch long. They are there mixed with water, forming a thin muddy liquid. The water contains a binding ingredient or size made from the leaves of various plants, among which were an *Actinidia*, a Holly, a species of *Lauraceae*, and a *Schizandra*. From this liquid the fibre is removed in thin films on a delicate tray of bamboo threads supported on a bamboo frame. Each film is a sheet of paper and only needs to be dried, first on a hot surface, and then in a strong lever press to be ready for market.

China Fir.—The China Fir (*Cunninghamia sinensis*) may be called *par excellence* the timber tree of China, for in a great part of the Empire boats, houses, furniture and agricultural machines are made of it. The large quantities grown in Fokien in former times have doubtless contributed to the prosperity of Foochow. The conditions of cultivation were investigated at Buong Kang near Yenping in that Province. It is called locally Sau Tsoi (杪材). Trees are grown from cuttings taken from branches of 2 years old or less. These are planted in rows, 12 feet apart, from the beginning of February to the equinox. The plantations are cleaned 2 or 3 times a year while the trees are young and are protected by fire barriers. The felled timber is extracted down made ways to the foot of the mountains and then carried to the river and made into large rafts. The timber is in demand for construction even in Hongkong although we are plentifully supplied with *Pinus massoniana*, because it is not subject to the attacks of white ants as is the latter species.

Bamboos of Fokien.—From the amount of ground, in those parts of Fokien visited during the year, which is taken up with Bamboo cultivation it seems probable that this is one of the chief industries of the Province. The steep sides of mountain valleys are the favourite situations. Sixteen kinds are recognized in the Yenping mountains:—

(1.) Ma Deuk (麻竹).—The commonest species, 20–50 ft. high. It is used for small buildings, and for making mats and paper. The shoots are eaten. It is planted from cuttings in the spring and remains for about three years before the shoots develop. Flowering is said to occur every five years. It appears to be a species of *Phyllostachys*. Fokien collection No. 932.

(2.) Ku Deuk (古竹) (Bitter Bamboo).—The bitter shoots are eaten. *Phyllostachys nigra*, Munro. Fokien collection No. 960.

(3.) Gong Nong Deuk.—Used for boat and chair poles. *Phyllostachys nigra*, Munro. Fokien collection No. 1,001.

(4.) Cieh Deuk (赤竹) (Folding Bamboo).—Shoots dried for export. *Phyllostachys nigra*, Munro. Fokien collection No. 962.

(5.) Uong Deuk (黃竹) (Yellow Bamboo).—A small variety planted for hedges. *Bambusa*, sp. Fokien collection No. 970.

(6.) Lek Deuk (蔴竹) (Clustered Bamboo).—A decorative species with remarkably long internodes. *Bambusa pallida*, Munro. Fokien collection No. 882.

(7.) Sioh Deuk (石竹) (Stone Bamboo).—Used for basket making. Basket making is an important industry and bamboo baskets are widely used and extremely cheap throughout the Province. *Phyllostachys nigra*, Munro. Fokien collection No. 1,000.

(8.) U Deuk (烏竹) (Black Bamboo).—Used for umbrella handles. *Phyllostachys nigra*, Munro. Fokien collection No. 883.

(9.) Heung Deuk (Square Bamboo).—Used for walking sticks. *Bambusa quadrangularis*, Fenzi.

(10.) Ming Deuk.—A small bamboo with a blotched purple and yellow stem. Little used. *Phyllostachys nigra*, Munro. Fokien collection No. 961.

(11.) Lu Deuk, so called, is only a large herbaceous grass.

(12.) Cieng Deuk.—Used for making sieves. The leaves, which are remarkably large and broad, are in common use for wrapping up food. *Arundinaria sinica*, Hance. Fokien collection No. 885.

(13.) Long Deuk (郎竹).—Edible shoots. *Phyllostachys nigra*, Munro. Fokien collection No. 886.

(14.) Dang Deuk.—*Phyllostachys nigra*, Munro. Fokien collection No. 887.

(15.) Man or Tsung Deuk.—*Phyllostachys nigra*, Munro. Fokien collection No. 971.

(16.) Mieng Deuk.—Used for making bamboo ropes. No leaf specimen was obtainable. Its use for the manufacture of the wonderfully strong and fray-resisting ropes so indispensable in navigating the Min rapids renders it locally an important plant.

The bamboos collected in flower were *Phyllostachys bambusoides*, Sieb; *Bambusa tuldoidea*, Munro; *Bambusa pallida*, Munro; and *Arundinaria densiflora*, Munro. With the exception of the last four, they were without flowers and their identification depended upon comparison of their leaves with named flowering specimens.

There are two methods employed in transporting the bamboos from the mountains to market. The stems are first tied into bundles of a few cwt. each and dragged by hand along smooth grooves on the mountain sides or, when very steep ground has to be crossed, along bamboo brackets fixed at short intervals in the rock. When a small stream is reached they are floated down it, sufficient water being confined into a narrow canal by means of shingle guides and barriers. On reaching a river larger rafts are made up and floated or rowed to the market town.

Additions to the Flora of Hongkong and the New Territory.

Illicium dunnianum, Tutch.—A new species found growing at Sam-tam-lo in the New Territory on the banks of a stream.

Talinum crassifolium, Linn.—This is an African species and was first discovered in a Chinese Garden in Hongkong as a weed some three or four years ago. Last year it was found cultivated at Sokunpo.

Camellia crapnelliana, Tutch.—Discovered on the south side of Mount Parker. A new species and only one tree found.

Chisocheton hongkongensis, Tutch.—A new species discovered in the ravine on the southern slope of Mt. Parker. The genus is new to China.

Microtropis, new species.—This is an interesting addition to the order *Celastraceæ* as the genus hitherto had not been recorded from China. It was found in a ravine below Mountain Lodge on the north-eastern slope of Mt. Victoria.

Desmodium latifolium, DC.—Several plants of this species were discovered at Sokunpo and the next day specimens were also brought in from the New Territory. Curious to relate its habitat in China had not been previously known, although plants were raised in England from seeds collected by STAUNTON who accompanied Lord MACARTNEY'S Embassy to China more than 100 years ago. The species is also a native of Africa, India and the Philippines.

Mucuna birdwoodiana, Tutch.—This plant has been known for several years but it has been confused with *Mucuna macrobotrys*, Hance. The flowers are ivory-coloured and are produced in panicles. Found on Mt. Parker, Mt. Gough and Taimoshan.

Derris Fordii, Oliv.—Discovered in the neighbourhood of Shek O Gap. Only previously known from the interior of Kwangtung and Central China.

Sycopsis sp.—This genus has hitherto been represented in China by a single species, but another was found some time ago at the Peak on the southern slope below Mountain Lodge.

Eugenia Jambolana, Lour.—Found growing at Repulse Bay and is not at all an uncommon tree in the Island. Not previously recorded from China.

Ammannia senegalensis, Lamk.—Found in the Colony for the first time at Sokunpo in a swamp. Previously recorded from the interior of Kwangtung Province.

Uncaria homomalla, Miq.?—Found in the upper part of the Glenealy ravine. Hitherto it has not been recorded from China.

Blumea myriocephala, DC.—This species was discovered at Little Hongkong. Only previously known in China from Formosa and the Loochoos.

Soliva anthemifolia, R. Br.—This is probably a weed of introduction as it has been discovered on cultivated ground at Sokunpo and Kowloon. It is a native of South America and Australia, but not previously recorded from China.

Artemisia lactiflora, Wall.—A plant of this was found in a flower-pot in the Gardens. It is a common plant in the neighbourhood of Canton and has lately been advertised at home by a well-known nurseryman as a very desirable flowering plant, which it certainly is.

Lindera megaphylla, Hemsl.—An interesting addition to the laurels of Hongkong. Found growing in a wood between Little Hongkong Village and Middle Gap, Black's Link. Only previously recorded from Kiangsi and Hupeh.

Bridelia Balansæ, Tutchet.—A new species first found in Tonkin and subsequently in Hongkong; one tree in the Happy Valley woods above the Bowen Road and another on the south side of Mt. Parker.

Quercus amygdalifolia, Skan?—A single tree on the north side of Mt. Cameron. Only previously known from Formosa.

Quercus Edithæ, Skan.—Two trees of this species were discovered on Mt. Gough in a ravine below the new Peak Garden. It was named after Lady BLAKE from specimens found in the New Territory during the time Sir HENRY BLAKE was Governor of the Colony.

Quercus sp.—A fine tree, between 30 and 40 feet high, was found growing with *Castanopsis Fabri*, Hance, in a ravine on the north-east slope of Mt. Victoria. It was in fruit and belongs to the section *Chlamydo-balanos* and will probably prove to be new.

Quercus sp.—A second species of this genus was found with the foregoing but in leaf only. It was a tree about 20 feet high and somewhat resembles in foliage *Quercus naiadarum*, Hance.

Quercus sp.—A tree 40 feet high found in the same wood as *Lindera megaphylla*. It was in leaf only but appears different from any other known Hongkong species.

Quercus sp.—Found at Mt. Davis in fruit. It is something like *Quercus thalassica*, Hance.

Castanopsis Fabri, Hance.—Several specimens of this tree were found in the same place as *Quercus Edithæ* and later on a very fine tree, 40 feet high, was discovered in a ravine on the north-east slope of Mt. Victoria below Mountain Lodge. Only previously known from Lofaushan, Fokien, and the New Territory.

Ophiopogon japonicus, Ker-Gawl.—Plants of this were found on the Black Mountain in 1903 and have been cultivated in the Gardens since. They flowered last year and were determined as above. Another species of *Ophiopogon* discovered on Mt. Parker has not yet been determined.

Ruppia maritima, Linn.—Discovered growing in Sheko lagoon. An interesting addition to the water-plants of the Island.

Bambusa Cantori, Munro?—In the Happy Valley woods; previously known from Lantao.

It may be interesting to note that *Paphiopedilum (Cypripedium) purpuratum*, Pfitz., which was considered an endemic species has been discovered on Ma On Shan in the New Territory during the past year.

In the "*Flora Hongkongensis*," BENTHAM enumerates 1,053 species. The additions (including HANCE'S 75) since the publication of the Flora now amount to between 400 and 500, and the publication of a new Flora (which should include all plants known from the New Territory) is becoming a growing necessity.

FORESTRY.

It will be remembered that the questions asked by the Hon. Mr. SHEWAN in Legislative Council on September 14th, 1904, led to a useful discussion (Legislative Council Paper No. 36 of 1905) upon the best method of managing the Pine plantations on the Island. Eventually the help of the Indian Forestry Department was sought and the Inspector General of Forests advised that the trees should be allowed to grow for 30 years (or in exceptional cases 35) before being felled. This rotation was adopted by the Hongkong Government with the slight change that 35 was to be the normal, 30 or less the exceptional term. It was further decided not to cut down blocks of trees except in the part of the Island remote from Victoria, viz., the Tytam and Stanley divisions; the "shelterwood strip system" was to be adopted in the Shaukiwan, Aberdeen and Pokfulam divisions, while the two divisions reaching from Belchers Bay to the Happy Valley are, His Excellency the Governor has since decided, to be preserved for artistic effect only.

The principal localities planted with pine during the year were Aberdeen (96,000 trees), this was the block cut down in 1904; Yaumati (50,000); Pokfulam (10,000); and Tytamuk (10,000). *Vide* Tables III and IV.

Very little felling took place during the year in consequence of the uncertainty which existed concerning the best means of conducting it. Unfortunately, however, the number of trees removed was swelled by an unusually large quantity of dead timber. As this department pointed out in 1904, the greater part of the plantations in the Island consist of tree which fall off in growth after 20 years and, no doubt, a considerable percentage die at that age or during the subsequent decade.

One of the great advantages of afforestation is the improvement of the soil. Pines will grow on very poor soil, but after one or two generations make the ground rich enough to support more valuable and more beautiful trees. This result will never be realized however in Hongkong, nor will the pines themselves flourish until the Chinese have been taught not to scrape up the rich pine-needle humus from the plantations for fuel. In some old plantations the ground is kept as bare and sandy as when the trees were planted. In consideration of these facts it is satisfactory that the hands of the forest guards have been greatly strengthened during the year for dealing with this difficulty and a large number of marauders have been arrested and punished.

The only serious cases of organized stealing of timber occurred at Aberdeen Brick Works and at Mong Kok (Table V). In the former case one man was caught after great difficulty and heavily punished. In the latter case three partners of the Government timber contractor were arrested and convicted, receiving various terms of imprisonment and banishment.

The Chinese licensed pine plantations in the New Territory have been regularly visited during the year. No cases of overcutting have been detected. A few licences have been cancelled because of the unauthorized cutting of wild trees by their holders. In order to facilitate the re-sowing of felled areas in the Chinese Forest Lots a notice was issued in November reminding Licence holders of their obligation to re-sow and offering seed from the Government plantations at cost price for the purpose. Owing to the scarcity of mature seed-bearing trees in the Chinese plantations the necessary quantity for re-sowing had previously been bought by plantation owners from Canton at about \$6 per lb. as far as could be ascertained. A good many applicants have, as a result, been provided with Government seed at 70 cents per lb. This reduces the cost of seed sufficient for one acre to 3 cents, when sown in the Chinese way.

The Chinese plantations in the Shatin Valley, from the Government Forest Nursery at Kanghau south-westwards to the gap, have been purchased by the Government. This block is more or less under the eye of the Government workmen at Kanghau and will require little extra protection. It is fairly well stocked with trees and these will be useful as shelter for the regular plantations when formed.

AGRICULTURE.

Nitroculture.—A small experiment was made with nitroculture in the Government Nursery at Sokunpo. The result was so encouraging that a further consignment has been ordered with a view to introducing the culture to the New Territory farmers in 1906. It has long been supposed that leguminous crops have the power of absorbing nitrogen from the air, thereby improving themselves and the soil without the use of fertilizers, provided only that certain bacteria exist in the ground. An American agriculturist has succeeded in cultivating these bacteria, and preparations can now be bought and the seeds artificially inoculated. Some of this nitroculture preparation was obtained and applied to a crop of peanuts. Two varieties of peanut were used. Plots without nitroculture were grown alongside for comparison. The results were as follows:—

Nature of Crop.	Treat- ment.	Weight of Crop.		Area. Sq. ft.	Average Weight of Nuts.	Probable market value of Nuts per acre.	Average Weight of Plants.
		Nuts.	Plants.		Per acre in lbs.		Per acre in lbs.
Large Ground Nut.	Nitro- culture.	55 lbs.	35 lbs.	734	3,264	\$146.88	2,077
Do.	Usual.	20 lbs.	12 lbs.	874	997	44.87	598
Small Ground Nut.	Nitro- culture.	19 lbs.	45 lbs.	528	1,567	70.51	3,705
Do.	Usual.	21 lbs.	52 lbs.	853	1,072	48.24	2,655

The cost of enough nitro-preparation for one acre is \$4 (Mexican), the expense of applying it to the seeds is negligible so that the increase in profit to the farmer per acre judging from this one experiment should be about \$100 for large, \$20 for small ground nuts. The success of bacteria cultures is notoriously uncertain and, while some trials may be more successful than this, others will possibly fail. The results of the New Territory crops will be reported.

LIBRARY.

The following periodicals and other works have been purchased:—

Acta Horti Petropolitani, XV. fasc. 3, XXI. fasc. 2.

Botanica Applicada na China, DA SILVA.

Botanical Magazine, 1905.

Botanisches Centralblatt, 1905.

Bulletin de l'Academie Imperial des Sciences de St. Petersburg. XV.-XXII., 1870-77.

Bulletin de l'Academie Internationale de Geographie Botanique, 1898-1904.

Bulletin de la Societe Botanique de France, 1882-1885.

Butterflies of Hongkong and Southern China, J. C. KERSHAW.

Dictionary of Gardening, NICHOLSON.

Flowering Plants and Ferns, WILLIS.

Gardeners' Chronicle, 1905.

Gardening for India, FIRMINGER.
 Journal of Botany, 1905.
 Journal de Botanique, 1887-1904.
 Journal of the Royal Geographical Society, 1905.
 Naturalists' Universal Directory.
 Timbers of Commerce, STONE

Periodicals were presented by the following establishments:—

Agricultural Departments of Cape of Good Hope, Jamaica, South Australia, United States, Victoria, West Indies, Western Australia, and from the University of California.

Botanic Gardens of Barbados, British Guiana, Calcutta, Ceylon, Dominica, Jamaica, Kew, Manila, Natal, Saharanpur, St. Vincent, Straits Settlements, Sydney, Tobago and Trinidad.

Forestry Reports were received from India relating to Ajmer-meswara, Andamans, Assam, Baluchistan, Bengal, Bombay Presidency, Burma, Central Provinces, Coorg, Dehra Dun, Madras Presidency, and Punjab.

The following works were also presented:—

Atlas de Philippines ; by the United States Government.

A Critical Revision of the Genus Eucalyptus, J. H. MAIDEN, Parts 6 & 7 ; by the Author.

A Review of the Identifications of the species described in Blanco's Flora de Filipinas, E. D. MERRILL ; by the Author.

Botanical Magazine, Tokyo, Vol. IX, No. 105 ; by Professor MATSUMURA.

Crataegus in Eastern Pennsylvania, C. S. SARGENT ; by the Author.

Flora of Ceylon, TRIMEN, parts IV and V with plates LXXVI-C ; by the Director, Royal Gardens, Kew.

Flora of the Presidency of Bombay, T. COOKE ; by the Author.

Hooker's Icones Plantarum, Vol. VIII, Part 4 ; by the Director, Royal Gardens, Kew.

Journal of the Board of Agriculture, London ; by the Board.

Journal of the College of Science, Imperial University, Tokyo, Vol. XVIII, Article 8, and Vol. XX, Article 3 ; by the University.

Kew Bulletin, parts published in 1905 ; by the Director, Royal Gardens, Kew.

Les Noces des Palmiers, J. BARBOSA-RODRIGUEZ ; by the Author.

Luizaery ou Curare, J. BARBOSA-RODRIGUEZ ; by the Author.

Manual of the Trees of North America, C. S. SARGENT ; by the Author.

Myrtacées du Paraguay, J. BARBOSA-RODRIGUEZ ; by the Author.

Natal Plants, J. MEDLEY WOOD, Vol. IV, Part 3, and Vol. V, Parts 1 and 2 ; by the Author.

Report on Rubber (Gold Coast) ; by the Director, Botanical and Agricultural Department, Aburi.

The Merchantable Timbers of Queensland, PHILIP MACMAHON ; by the Secretary for Agriculture, Queensland.

Trees and Shrubs, C. S. SARGENT, Part IV ; by the Author.

REVENUE.

The details of revenue for the year are given in Table VI.

STAFF.

The department was administered by the Superintendent from January 1st to April 20th, and from June 24th to December 31st. The Assistant Superintendent resumed his duties on March 30th after a year's absence in England. He acted for the Superintendent from April 21st to June 23rd, during the absence of the latter in the interior.

S. T. DUNN,

Superintendent, Botanical and Forestry Department.

6th April, 1906.

Table I.

1905 RAINFALL.—BOTANIC GARDENS.

Date.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
1, .....	...	.01	.73	...	...	9.70	.04	.45	.13	.24	...	...
2, .....	...	.01	.01	.01	...	.74	...	3.08	.01	.06	...	...
3, .....	...	...	.06	.02	.07	...	...	.37	...	.03	...	...
4, .....	...	...	.02	.09	.03	.10	...	.19	.15	...	...	...
5, .....	...	...	.02	.01	...	.10	.87	...	...	...	...	...
6, .....	...	.01	.11	...	...	.15	...	...	.01	...	...	...
7, .....	...	...	.11	...	...	5.58	1.35	...	.07	...	...	...
8, .....	...	.02	.02	...	...	.17	1.11	...	...	...	...	...
9, .....	...	.07	...	.01	...	.44	.87	.02	1.03	...	...	...
10, .....	...	...	...	.26	...	.12	...	.05	.43	...	...	...
11, .....	...	...	...	.04	...	...	...	.14	...	...	...	...
12, .....	...	...	...	.14	...	.59	...	.93	...	...	...	.05
13, .....	...	.05	...	.26	...	...	...	.11	...	...	...	...
14, .....	...	...	...	.01	...	.13	.03	...	...	...	...	...
15, .....	...	...	...	.02	...	.12	...	...	...	...	...	.01
16, .....	...	...	2.63	.02	.02	...	...	...	.28	...	...	.35
17, .....	...	...	.07	...	...	.08	...	...	.08	...	...	.01
18, .....	...	...	...	...	...	.09	...	.35	...	.01	...	...
19, .....	...	...	.98	...	...	...	...	.80	...	...	...	...
20, .....	...	.09	1.98	...	.01	.06	...	.59	.04	...	...	...
21, .....	...	...	1.20	.27	...	...	.03	.74	2.28	...	...	...
22, .....	...	.05	.26	.08	...	.26	.83	.15	.02	...	.13	...
23, .....	...	.02	.11	.04	.36	2.70	.17	.07	...	...	...	...
24, .....	...	.04	1.11	...	.04	2.10	.61	.02	...	...	.01	.02
25, .....	...	.07	1.10	...	...	.03	.70	.01	...	...	.09	.25
26, .....	.01	.24	.62	...	.50	.01	1.37	...	...	...	.06	1.35
27, .....	.51	...	.55	...	...	.02	.63	...	...	...	...	...
28, .....	.02	.02	.53	...	...	...	.69	...	1.35	...	.09	...
29,	1.03	...	.95	...	.03	...	1.47	.10	.13	...	...	.52
30, .....	.13	...	.04	...	2.24	...	.03	.01	.15	...	...	.10
31, .....	...	...	.01	...	2.04	...	...	2.47	...	...	...	...
Total, ...	1.70	.70	13.22	1.28	5.34	23.29	10.80	10.65	6.16	.34	.38	2.66

Total Inches for the year, 76.52.

Observations made at 10 A.M.

Elevation, 300 ft.

Table II.

LAND UNDER COMPLETE OR PARTIAL MANAGEMENT OF
BOTANICAL AND FORESTRY DEPARTMENT.

1. Botanic Gardens.
2. Blake Garden.
3. Peak Garden.
4. King's Park, Kowloon.
5. West End Park.
6. Government House Grounds.
7. Mountain Lodge Grounds.
8. Government Offices Grounds.
9. Colonial Cemetery.
10. Sookunpo Government Nursery.
11. Kang Hau Forest Nursery.
12. Sookunpo Bamboo Nursery.
13. North Point Tree Nursery.
14. Loan Plant Compound, Garden Road.
15. Albany Nursery.
16. Rockery in Garden Road
17. Do. (upper) in Albert Road.
18. Do. (lower) do.
19. Do. (upper) in Peak Road.
20. Do. (lower) do.
21. Do. (upper) at St. Joseph's Church.
22. Do. (lower) do.
23. Do. in Glenealy Road, below Robinson Road.
24. Do. do. below first bend.
25. Do. do. below second bend.
26. Do. do. below third bend.
27. Do. do. below Cathedral.
28. Do. do. lower part, W.
29. Do. do do, E.
30. Do. at junction of Seymour and Robinson Road.
31. Plot over Garden tank at junction of Bowen and Garden Roads.
32. Do. above Garden Cottages.
33. Do. in front of St. Joseph's Church, Garden Road.
34. Bank in Bridges St.
35. Do. opposite main entrance to Government House Grounds.
36. Do. between Garden Road and Albert Road.
37. Do. between Upper and Lower Albert Roads.
38. Do. south of Lower Albert Road, opposite Government Offices.
39. Do. south of Volunteer Parade Ground.
40. Do. Lower Albert Road, opposite Volunteer Parade Ground.
41. Do. between Albany Road and Upper Albert Road.
42. Do. on north boundary of New Garden, Caine Road.
43. Do. between Wyndham Street and Lower Albert Road.
44. Do. on north side of Government House Grounds.
45. Do. between Lower Albert Road and Ice House Street.
46. Do. on south side of Battery Path.
47. Do. on north side of Battery Path.
48. Do. east of Garden Road Nullah, between Kennedy Rd. & Macdonnell Rd.
49. Do. east of Garden Road Nullah, between Macdonnell Rd. and Bowen Rd.
50. Do. above Bowen Road at junction of Bowen and Garden Roads.
51. Do. west of Glenealy Nullah below Robinson Road Bridge.
52. Do. west of Garden Road Nullah between Garden Cottage and Bowen Road Bridge.
53. Do. between Tramway and Garden Road Nullah, below Kennedy Road.
54. Rockery in Robinson Road, S.W. of West End Park.

Table VI.

REVENUE FOR 1905.

	\$ c.
Sale of Forestry Products,	1,779.84
Sale of Plants,	654.75
Loan of Plants,	426.82
Forestry Licences in New Territory,	607.53
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Total,	\$3,468.94
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