REPORT

ON

THE FEDERATED MALAY STATES AND JAVA;

THEIR SYSTEMS OF GOVERNMENT, METHODS OF ADMINISTRATION, AND ECONOMIC DEVELOPMENT,

BY

SENATOR THE HONORABLE STANIFORTH SMITH.

Presented by Command; ordered by the Senate to be printed, 20th June, 1906.
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INTRODUCTION.

In compliance with the request of the Prime Minister I have prepared a Report on the Systems of Government, Methods of Administration, and Economic Development of the Federated Malay States and Java.

During the months of February, March and April, of this year, I visited these countries, and in my general investigation devoted particular attention to those Plantation Industries that, in the opinion of the highest authorities, were suitable for immediate cultivation in our Territory of Papua. A chapter has been devoted to the well-organized and efficient Civil Service of the Malay States, describing in some detail the Classification, Departments, Entrance Examinations, Salaries, Retiring-Age and Pension System, in the hope that it may be of assistance in re-organizing the Civil Service of Papua. I have been most careful not to burden my Report with administrative details and difficulties concerning those Possessions, that have only a local application, nor have I clogged my pages with any detailed particulars regarding certain valuable plantation industries which are suitable so far as the climate and soil of Papua are concerned, but which require (a) skilled labour in the production or preparation of the product; (b) the investment of a large amount of capital in plant and machinery; or (c) necessitate the inauguration of irrigation schemes for their cultivation.

In other words, I have endeavoured to make my Report thoroughly practical and as concise as the many difficult problems in tropical administration and development would permit.

I desire also to place on record my appreciation of the great kindness and courtesy I have experienced both from the British and Dutch authorities throughout the whole of my investigations, which I ascribe to the very friendly feeling they entertain towards our young Commonwealth. The Director of Agriculture for the Federated Malay States, and the curators of the various botanical and experimental gardens were requested to supply me with all particulars regarding horticultural development. I was everywhere met by Government officials who drove me out to the plantations and introduced me to the leading planters. During the course of my investigations in the Malay States which extended over five weeks, I travelled more than one thousand miles through the peninsula, and inspected every plantation industry in the Protectorate. From the Malay States I extended my visit to Java. His Excellency the Governor-General was good enough to personally interest himself in my mission, and issued instructions to the Directors of the various Departments to supply me with whatever information I required regarding the Government and industries of Netherlands India; a similar courtesy was also extended to me at their various magnificent Botanical Gardens, and in every part of Java to which I travelled.

If my Report proves of value in forming the basis of a developmental policy in Papua, it must be ascribed largely to the exceptional sources of information that were laid open to me. While it may appear invetious to single out any one in the administrative service for special thanks, I cannot help expressing my great obligations to the Director of Agriculture for the Netherlands East Indies, and Curator of the great Botanical Gardens at Buitenzorg, in Java. Dr. Treub is perhaps the greatest living authority on tropical agriculture, and the information and advice he afforded me were of the greatest value.

I have endeavoured throughout my Report to preserve the strictest accuracy in the large amount of information I have collected. On all subjects of special importance, I have submitted my notes to experts, and the sources of my information have invariably been of the most trustworthy nature.

If the information in this Report, which in its collection and compilation has occupied my undivided attention during the last four months, proves of benefit to the Commonwealth and assistance to our new Possession, I shall feel amply rewarded for any time and trouble I have expended in its production.

(Signed) STANIFORTH SMITH.

The Senate,
Melbourne, 11th June, 1906.
PART I.

THE FEDERATED MALAY STATES.

GOVERNMENT ADMINISTRATION AND ECONOMIC DEVELOPMENT.

CHAPTER I.

GOVERNMENT AND LEGISLATION.


The Federated Malay States are the "Hinterland" of the Straits Settlements. They comprise what were formerly the independent Native States of Perak, Selangor, Negri Sembilan, and Pahang. These countries stretch right across the Malay Peninsula, and are bounded on the north by certain Malay States under the protection of Siam, and on the south by the territory of Johore. The total area is approximately 26,000 square miles, or a little more than one quarter the size of Papua. In 1874 a British Resident was appointed to the State of Perak, and from this centre British influence gradually spread until by 1888 protection had been extended to the remaining three States. A new phase was entered upon in July 1895, by the execution of an agreement, between the Imperial Authorities and the Sultans of the four States, by which these territories were combined in a Federation to be administered under the advice of a Resident General, in addition to the four British Residents in each State. The Sultans further agreed to render one another such financial and military assistance as the British Government might advise.

The Federation differs from all others in the fact that it has no Federal Laws. Each State makes its own laws (which are previously sanctioned by the High Commissioner), and collects and expends its own revenue. The reason for this appears to be that the Sultan is nominally paramount in each State, and the British residents are nominally his advisers, and nothing is done to offend the susceptibilities of the Sultans or to detract from their pomp and outward power.

All Laws in the States begin:— "It is hereby enacted by His Highness the Sultan-in-council as follows." Actually all laws are drafted by the British, and their enactment is little more than a formal but necessary corollary.

CENTRAL ORGANIZATION.

The Governor of the Straits Settlements also holds the office of High Commissioner for the Federated Malay States. Under him is the Resident General who lives at Kuala Lumpur, the local seat of Government. He is the principal civil Officer in the States, and in him is vested the general direction of affairs. He is assisted by a Staff of Federal Officers, who control the following Federal Departments:—Finance, Lands and Mines, Police, Prisons, and Education. The Federal Staff also includes the Secretariat, the Judicial Commissioner, in whom is vested the supreme judicial authority, the Legal Adviser, the Commandant of the Forces, the Conservator of Forests, the General Manager for Railways, the Director of Public Works, the Director of the Institute for Medical Research, and the Director of Agriculture.

PROVINCIAL ADMINISTRATION.

Under the Resident General are four British Residents, one for each State. Their duties are numerous and important, comprising administrative, judicial, and fiscal functions.

Each State is divided into five or six Districts, with a District Officer (and sometimes one or two assistants) at the head of each, who are immediately responsible to the British Resident. In a few instances the District Officers are Malays of high family. Assisted by various civil servants, these Officers constitute the Provincial Administration. With few exceptions they represent the various Federal Departments in the States, and supervise the prisons, direct the sanitation, and collect the taxes.
**Native Organization.**

It would be impossible to carry on all the administrative and judicial work of Government with British Officers unless at an expense that would cripple the finances. The British administration has therefore been superimposed on the lower strata of the native organization. The Sultans and Territorial Chiefs have been brushed aside, except as regards their functions on the Council.

The Penghulus or Native Magistrates are the connecting link between the British Official and the raiat. They have either been trained in the Civil Service or are leading men in the State. Their duties are many, and their services indispensable. There are from 40 to 60 in each State. The duties they undertake relate exclusively to the natives. They have no jurisdiction over Europeans. They advise the people of the requirements of the Government, and see that the law is carried out. They either collect the rent from the native lease-holders or assemble them together at stated periods to enable the District Officer to do so. They report on the native applications for land, see that the natives plant rice (their staple food) annually, and in the method prescribed. If a native neglects his holding and allows the jungle to grow up, they advise the District Officer, who installs another man, who can take one paddie crop without paying rent. They hold Petty Courts, and can hear all native claims for debt where the amount does not exceed 10 dollars (in Pahang 25 dollars).

They are assisted by the "Katuah" or Elder of the Village (who corresponds with our village constable in Puglia) in all these multifarious duties.

Besides the Civil British and Native Courts there is an Ecclesiastical Hierarchy, at the head of which is the Sultan. The chief "Kathi" or priest, assisted by other "Kathis," holds courts to try cases connected with marriage, divorce, inheritance, breaches of Mohammedan Law, etc. They are empowered to adjudicate in cases regarding the division of property up to £15; and to inflict fines as high as £1 5s., and imprisonment not exceeding one month. Assistant "Kathis" can impose fines up to 12s., and imprisonment for fourteen days. A more serious offence, or important litigation under these heads, is tried by a British Magistrate.

**Legislation.**

A Conference of British residents presided over by the Resident General is held at least twice a year at Kaula Lumpur, and often if necessary, to discuss Legislative and Administrative matters. At this Conference various Bills drafted by the Legal Adviser are submitted and discussed. By this means certain State Laws—where unity of action is essential—are prepared and subsequently passed by all the States in exactly similar language, thus practically constituting Federal Laws. In the year 1901 102 enactments were passed (Perak 29, Selangor 27, Negri Selatan 27, Pahang 19), of which 42 were enacted in similar terms in the whole four States. They deal with Sanitary matters, Mohammedan Law, Probate Administration, Criminal Procedure, Police Pensions, Import and Export Duties, Naturalization, Indian Immigration, and Land, Mining, and Railway matters. After the Conference has adopted or amended the Bills submitted by the Legal Adviser, they are finally re-drafted and approved by the High Commissioner. The Bills are then forwarded to the British Residents who submit them to the State Councils. The members, twelve or more in number, constituting the Council, are the Sultan, who as ruler, presides, the British resident, the Secretary to the Resident, where such an office exists, the Principal Malay Rajahs or territorial chiefs, one or more influential Chinese citizens, and one or more non-official British citizens. The enactment of the laws by the State Council is merely a formal though necessary proceeding, as alterations are seldom if ever made in them at this stage. This method is necessary so that the supreme power will nominally rest with the Sultan, as the States have not been annexed but are only under the protection of Great Britain. After the Bills have been passed they are sent to the Secretary of State for the Colonies for final approval.

The Sultans are paid by the British from £1,250 to £7,000 a year, and the Rajahs from £150 to £1,400 a year. These are commuted allowances in lieu of certain rights and titles. The Sultans and Rajahs draw a large revenue.
System of Taxation.

The system of taxation in the Federated Malay States is perhaps unique. In respect to Custom taxation, there is free-trade in imports, and there are duties on most of the exports. The only taxation is in the farming out of the gambling and pawnbroking concessions. In its practical application nearly the whole of the taxation is paid by the Chinese section of the population. Four-fifths of the export duties are paid on tin, and the tin mines are chiefly owned and entirely worked by Chinese. The taxation derived from spirits, opium and gambling is also principally paid by the Chinese, as the Malay, being a Mohammedan, does not drink intoxicants nor smoke opium.

There is an import duty of 8s. 3d. a pound on opium, and on spirituous liquors 7s. per case of 15 bottles. From spirits made from rice, sugar and rags, 5d. per quart; on vermouth, 2½, per quart; on toddy, ½d. a pint. These duties vary slightly in the State of Pahang. No duty is imposed on tobacco.

The selling prices of the above imports are fixed by the Government. Every year tenders are invited for the right to collect the duties on each of these articles.

The successful tenderers are invariably Chinese, and their tender for the opium concession is usually about £268,000 a year.

The export duties range from 1 per cent. to 10 per cent. No export duty is charged on coffee if the selling price is less than 4d. a pound.

When the value of alluvial tin is £10 17s. to £11 4s. per bhara (400 lbs.) the export duty is £1 8s. 4d. per bhara. For each rise of 7s. per bhara above £11 4s. and up to £13 6s., the duty is increased 7d. per bhara, and when above £13 6s., the duty is increased 1s. 2d. for every rise of 7s.

On lead tin the duty is one-half the current rate on alluvial tin with a minimum duty of 5 per cent. ad valorem. On tin ore the export duty is 70 per cent. of the duty on tin.

On gold, the export duty is 2½ per cent., and on wolfram, 7s. per 400 lbs.

The Estimated Revenue for 1906 is £2,770,411 obtained from the following sources:

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Revenue (exclusive of Premia on Leases)</td>
<td>£191,175</td>
</tr>
<tr>
<td>Customs (including £1,018,666 export duty on tin, and £290,882 import duty on opium)</td>
<td>£394,970</td>
</tr>
<tr>
<td>Port and Harbour Dues</td>
<td>£2,876</td>
</tr>
<tr>
<td>Licenses (including Opium Selling Licenses)</td>
<td>£533,057</td>
</tr>
<tr>
<td>Fees of Court or office</td>
<td>£52,981</td>
</tr>
<tr>
<td>Interest on Surplus Revenue Investments</td>
<td>£54,388</td>
</tr>
<tr>
<td>Federal Receipts (Railways £482,553)</td>
<td>£607,281</td>
</tr>
<tr>
<td>Miscellaneous Receipts</td>
<td>£2,805</td>
</tr>
<tr>
<td>Municipal Assessments and Lighting</td>
<td>£72,508</td>
</tr>
<tr>
<td>Premia on Agricultural Land</td>
<td>£7,698</td>
</tr>
<tr>
<td>Premia on Mining Leases</td>
<td>£10,865</td>
</tr>
</tbody>
</table>

Total Estimated Revenue: £2,770,411

The Estimated Expenditure for 1906 is £2,437,831, the details of which are:

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Emoluments</td>
<td>£591,325</td>
</tr>
<tr>
<td>Other Charges</td>
<td>£411,871</td>
</tr>
<tr>
<td>Pensions and Retiring Allowances</td>
<td>£34,838</td>
</tr>
<tr>
<td>Transport</td>
<td>£6,394</td>
</tr>
<tr>
<td>Interest</td>
<td>£3,963</td>
</tr>
<tr>
<td>Miscellaneous Services</td>
<td>£30,342</td>
</tr>
<tr>
<td>Purchase of Land</td>
<td>£2,471</td>
</tr>
<tr>
<td>Expenditure under Volunteer Enactment</td>
<td>£1,497</td>
</tr>
<tr>
<td>Works and Buildings</td>
<td>£288,241</td>
</tr>
<tr>
<td>Roads, Streets and Buildings</td>
<td>£457,742</td>
</tr>
<tr>
<td>Irrigation Works</td>
<td>£18,855</td>
</tr>
<tr>
<td>Railways</td>
<td>£581,390</td>
</tr>
</tbody>
</table>

Total Estimated Expenditure: £2,437,831
It is worthy of notice that in Public Works and Maintenance £1,346,528 is to be spent—a sum equal to nearly 60 per cent. of the total revenue. So large a percentage of revenue spent in public works is probably unequalled in any part of the world.

**LAND LAWS.**

According to the old Malay law the people owned no land, but only the things on it. All the land belonged to the Sultans. The Rajahs, or territorial chiefs, collected the rents within their jurisdiction and paid tribute to the Sultan. They were also obliged in time of war to turn out a stated number of fully equipped soldiers for the use of the Sultan—like the old feudal barons of England. The only exceptions to this general rule were in the case of important chiefs who owned large estates on which they paid no rent, and in the State of Negri Sembilan where certain ancestral lands belonged to native families.

These lands are held exclusively by the women, who are entitled to their use and occupation from generation to generation rent free, so long as they cultivate them. But if the land remains out of cultivation for three years it reverts to the Sultan, and the family loses it irrevocably. So jealously were the property rights of the women regarded, that if a native from another State settled in Negri Sembilan and married a woman there, in the event of her subsequent death, he could only claim half the property that had been acquired since their marriage.

The British Government has wisely decided to continue the perpetual lease system, with the result that not a single acre of land has been alienated in fee simple, and the Government is in possession of an ever increasing rent roll, drawn both from the native tenants and the planters.

The whole of the cultivated land (with the exception of certain vested rights existing when the protectorate was proclaimed) is held under perpetual lease, subject to certain improvement conditions and rights of reassessment.

The lease stipulates that at least one-twentieth of the land must be cultivated progressively each year for five years: at the end of that period one-fourth is under cultivation, and such a proportion must remain cultivated during the existence of the lease. If the economic plant grown is an annual—such as rice and tapioca—the Government will resume the lease, provided the land is left uncultivated for four years.

The leasehold land is divided into two classes according to its value, which is appraised with respect to its fertility and accessibility.

For first-class land a premium of 7s. an acre has to be paid as soon as the lease is granted, and for the first six years the rental is 2s. 4d. an acre, and 9s. 4d. an acre afterwards. For second-class land a premium of 4s. 8d. an acre is charged, with a rental of 2s. 1d. an acre for the first six years, and 7s. an acre afterwards. The lower rental for the first six years is to enable planters of rubber and coconuts to tide over the six long years that must elapse before their trees are revenue producing.

Personally, I am inclined to think the rentals and survey fees are too high, in spite of the fact that applications for leases are pouring in from all parts. The tendency appears to be to monopolize the planting lands in the hands of wealthy capitalists and syndicates, to the exclusion of the smaller man. If small holdings were being taken up it would not necessitate a much larger white population, which would be of great advantage to the administration. For native and other holdings under ten acres in area the rentals are as follows:

- **First-class**—1s. 9d. to 7s. 5d.
- **Second-class**—1s. 10d.
- **Third-class**—1s. 5d.

and no premium.

Re-valuation

At the end of 30 years the Government has the right to re-value the land, and increase or decrease the rental as they think fit, provided it is computed on its unimproved value.

Papua

A very similar policy to this I have long advocated for Papua, viz.:—A perpetual lease at a peppercorn rental for say ten or fifteen years, and thereafter subject to re-valuation at stated periods on the unimproved or scrub value of the land. The Federal Government having decided to adopt the leasehold system, it is to be hoped that the local authorities will concede the longest tenure possible, subject to re-appraisements on the unimproved value.
An applicant can take up any area in reason, subject to the consent of the British Resident, and subject to any existing rights. If there are any native holdings in the area applied for they are excised before the lease is granted.

All applications for land are made to the District Land Office. The District Officer has power to grant applications up to 10 acres; if the area applied for is larger than he has power to deal with, he refers it to the British Resident, who has power to grant a lease up to 640 acres. If the area exceeds 640 acres it is referred by the British Resident to the Resident General. In Papua every application for a lease, however small, has to be referred to the Executive Council at Port Moresby. This extreme centralization, and consequent delay owing to infrequency of communication, has resulted in stopping development in Papua.

The area of land held under lease for agricultural purposes in the Federated Malay States at the end of 1901 was 581.841 acres, and for mining purposes 313.786 acres, or 1.49th of the total area of the States.

All town and village lots are sold by auction. The price offered for the allotment constitutes a premium, which is paid over to the Government, the annual rent paid for the allotments being 1 per cent. of the premium paid. The reserve premia are fixed by the Resident. In addition a commission has to be paid, ranging from 1 per cent. to 5 per cent., according to the premium bid.

Survey Fees.

The Government survey fees are fixed on a graduated scale, according to the acreage—

<table>
<thead>
<tr>
<th>Acreage</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>For 5 acres and under</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For 100 acres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For 1000 acres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For 10,000 acres</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In addition to the survey fee, a fee of 1s. 5d. is charged for each boundary-mark inserted. The preparation of the grant or lease costs 4s. 8d.

The Mining Laws.

Mining leases are obtained either by auction, tender, or selection. The reserve price on lands to be disposed of by auction or tender is fixed by the Resident, and the premium paid on State land is disposed of is ordinarily the price bid or tendered. When land for mining is obtained by selection the premium charged is £1 3s. 4d. per acre. The annual rent of the mining lease is fixed at 2s. 4d. an acre. The term of the lease does not usually exceed 21 years, except in the case of special concessions, where a large outlay of capital is necessary. The leases are forfeitable unless the conditions imposed by the Government are fulfilled, the chief of which are continuous working and the employment of an adequate labour force. Full information regarding these are set out in the Federated Malay States mining enactment 1899. Intending lessees of mining land can obtain prospecting licenses over defined areas for a stated period, which enables them to obtain an option of the area while the ground is being tested.

CHAPTER II.

Administration.

Administrative Civil Service—Clerical service—Departments—Police and Military.

The Administrative Civil Service.

All cadets, before they are appointed, have to pass the Civil Service Commissioners' Examination in England, and are selected for Hong Kong, the Straits Settlements, the Federated Malay States, and Ceylon, after those required for the Imperial Civil Service have been chosen.

Cadets also have to pass within a prescribed period an examination in one of the three local languages, Malay, Tamil, or Chinese, and also an examination in law. If they pass in more than one language they are entitled to an increased emolument. Those who are instructed to study Chinese, or Tamil, are sent to China or India, as the case may be.

Retirement at the age of 55 is optional, at 60 compulsory.
If an officer is permanently injured in the actual discharge of his duty so that his capacity to contribute to his support is destroyed, he receives a pension of one-third of his salary.

After ten years (if his health breaks down) he is entitled to a pension of 15-60ths of his salary (5-60ths being added for climate allowance); for every year's service after that 1-60th is added up to 35 years' service. The maximum pension he can draw is two-thirds of the highest salary earned, exclusive of allowances.

The selection of officers possessed of professional qualifications rests with the Secretary of State for the Colonies.

The Staff Appointments (five in number) are as follow:

<table>
<thead>
<tr>
<th>Classification of Administrative Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Appointments</td>
</tr>
<tr>
<td>Residences of the Federated Malay States</td>
</tr>
<tr>
<td>Resident General of the Federated Malay States</td>
</tr>
<tr>
<td>Resident, State of Perak</td>
</tr>
<tr>
<td>Selangor</td>
</tr>
<tr>
<td>Negri Sembilan</td>
</tr>
<tr>
<td>Pahang</td>
</tr>
</tbody>
</table>

In addition to these salaries the Resident General receives an entertainment allowance of £240 a year, and the Residents each an allowance of £120.

Class I.—In this class there are six officials, the Federal Secretary, the Legal Adviser, the Financial Commissioner, the Commissioner for Lands and Mines, the Secretary for Chinese Affairs (all of whom receive £1,200 a year), and the Commissioner of Police at £1,020 a year.

Class II.—There are ten officials in this class, including the Secretary to the Resident of the State of Perak, the Senior Magistrates for the States of Perak, Selangor and Negri Sembilan, the Chief Auditor, the Senior Warden, the Director of Post and Telegraph Department, the Inspector of Schools, and two District Officers. Their salaries range from £780 to £1,020 a year.

Class III.—Seventeen officials, including the Secretary to the High Commissioner, eight District Officers, three Deputy Commissioners of Police, the Protectors of Chinese, and other officials connected with the collection of Revenue and Sanitary Boards. Their salaries range from £660 to £780 a year.

Class IV.—Twenty-eight officials, including twelve District and Assistant District Officers, with Salaries ranging from £540 to £600.

Class V.—Twenty-four officials, including eleven District Officers with salaries ranging from £420 to £480.

Class VI.—Twenty-five officials, including fifteen Assistant District Officers with salaries ranging from £350 to £400.

The Clerical Service.

The appointments to the Clerical Civil Service of the Federated Malay States are divided into the following classes:

Special Class.—Four appointments, to be increased later to six, £254 to £282, by annual increments of £11.

Class I.—Sixty-five appointments, £141 to £212, by annual increments of £11, and after three years' satisfactory service from £212 to £226.

Class II.—145 appointments, £100 to £134, by annual increments of £7.

Class III.—£50 to £85, by annual increment of £7.

Appointments in Classes I and II are on the pensionable establishment, and officers in Class III, will come on the pensionable establishment on reaching the maximum salary of £85. Every applicant for a Class III, clerkship must be over 16 and under 24 years of age, must be of good character, and must have passed the Government Seventh Standard Examination in the Federated Malay States or the Straits Settlements. He may also be called upon to pass an entrance examination to be set by the Federal Inspector of Schools. Vacant appointments in Class III, are given to those who have passed these examinations by selection, and not necessarily
according to their position in the list of candidates. A clerk is not eligible for promotion to Class I, unless he has passed the Senior Clerical Examination, and no clerk in Class III. is eligible for Class II, until he has passed the Junior Clerical Examination.

**Junior Clerical Examination.**

The following are the subjects in which a clerk must have passed before becoming eligible for promotion to Class II:

1. Copying manuscript, e.g., draft or minute.
2. Typewriting.
3. Knowledge of such General Orders as are applicable to all Departments.
4. Knowledge of the terms and contractions used in Official correspondence.

**Senior Clerical Examination.**

This embraces the following subjects:

1. English composition, especially drafting a letter.
3. General knowledge (this examination is partly *viva voce*).
4. Docketing, tabulating, and indexing.
5. The keeping of simple accounts.

In promotions consideration is given to merit as well as seniority.

**Departments.**

The following are the principal Departments, with the salaries of the chief officers:

**Agricultural Department.**

Director of Agriculture and Government Botanist, salary, £800.
Inspector of Coconut trees, salary, £420.
Superintendent Experimental Plantations, maximum salary, £420.
Superintendent Government Plantations, salary, £240.

It is intended to supplement these officers by the appointment of an Agricultural Chemist and an Entomologist.

**Education Department.**

Inspector of Schools, maximum salary, £900, with a staff of State and Assistant Inspectors drawing salaries ranging from £350 to £480 a year.

**Forest Department.**

Conservator of Forests, maximum salary, £1,200, assisted by a staff of technically and non-technically trained officers, classified as Deputy Conservators, Assistant Conservators, and Rangers.

**Geological Department.**

Government Geologist, salary, £800.

**Indian Immigration.**

Superintendent of Immigration and Protector of Labour, salary, £1,000.
Assistant Superintendents in the various States, salaries, £350 to £600.

**Institute for Medical Research.**

Director, salary, £800; two assistants, salaries, £360 to £420.

**Marine Department.**

Three Harbor Masters and Engineers, salaries, £210 to £480.

**Medical Department.**

Four State Surgeons, salaries, £480 to £840; Senior District Surgeon, House Surgeon, sixteen District Surgeons, salaries, £350 to £480; 31 Assistant Surgeons and Apothecaries, salaries, £100 to £150; four Veterinary Surgeons, £120 to £480.
Lands and Mines Department.
Commissioner of Lands and Mines, salary, £1,200; Senior Warden of Mines, maximum salary, £1,020; two Wardens, salaries, £540 to £660; four Assistant Wardens, salaries, £420 to £540; Inspectors of Mines and Boilers, salaries, £210 to £420.

Treasury.
Financial Commissioner, salary, £1,200.

Museums.
Director, maximum salary, £540.
2 Curators, salaries, £240 to £300.
2 Taxidermists, salaries, £210 to £240.

Police Department.
Commissioner of Police, £1,020.
4 Assistant Commissioners, £350 to £780.
42 Probationers and Inspectors, £180 to £350.

Post and Telegraph Department.
Director of Post and Telegraph Department (maximum salary), £900.
4 Superintendents, £540 to £600.
Postmasters, Accountants, Inspectors, £150 to £540.

Printing Department.
Superintendent (maximum salary), £540.
Assistant Printers, £240 to £360.

Prisons' Department.
5 Gaolers, £210 to £300.
2 Chief Warders, £210 to £240.
32 European Warders, £110 to £215.

Public Works Department.
Director of Public Works, £1,200.
4 State Engineers, £780 to £900.
22 Executive Engineers, £480 to £780.
20 Assistant Engineers, £360 to £180.
6 Clerks of Works, £240 to £300.
6 Draughtsmen and Inspectors, £150 to £210.

Revenue Survey Department.
4 Superintendents of Revenue Survey, £480 to £660.
15 District Surveyors, £420 to £480.
18 1st grade Surveyors, £330 to £420.
18 Assistant Surveyors, £120 to £240.
19 Draughtsmen, £150 to £420.

Trigonometrical Survey Department.
Director of Surveys (Chief Surveyor), £840.
Assistant Surveyors, £560 to £540.
Draughtsmen, £120 to £420.

Railway Department.
General Manager, £1,200.
Chief Resident Engineer, £960.
Traffic Manager, £720.
assisted by a large staff.

Police Force.
The laws are enforced by a police force numbering 2,276, including 42 European Officers. The members of this force are made up of Malays and Sikhs, and excellent law and order is kept amongst the various nationalities and creeds.
Military.

In case of a riot or rebellion there is also an efficient military force known as "The Malay States Guides," consisting of a battalion of Sikhs and Pathans (the latter are Mohammedan Hindoos), to which is attached an artillery corps with field guns. The total strength is 842 men, including twelve British officers. They are all of magnificent physique, excellently drilled, while their rifle shooting has won them numerous challenge shields. General Inigo Jones, who inspected them recently, reported that there were no more efficient or better drilled men in the British Army.

CHAPTER III.

Economic Conditions.


Character of the Country

The Malay Peninsula is a comparatively narrow slip of land lying between the Straits of Malacca on the west, and the China Sea on the east, the Federated Malay States being situated in the central and broadest part of the Peninsula. A range of mountains runs like a backbone almost throughout its entire length, attaining here and there an elevation of from 4,000 to 7,000 feet. This range is the source of numerous rivers and streams, which flow east or west to the sea. These in former times—as in Papua to-day—constituted the only means of access to the interior, as the whole country, except where cultivation has taken place, is covered with thick jungle and tropical vegetation.

Soils.

The character of the soil varies greatly according to elevation. The mountain ranges of the Peninsula are chiefly granite, giving a poor light clayey soil, the least valuable of any in the Peninsula. The foothills of the mountain ranges are of laterite, sandstone, granite, and limestone. The red laterite soil, though not so rich as the coastal alluvium is well enough suited for many crops, and rubber plantations flourish fairly well on it.

To the west of the main range, and between it and the Straits of Malacca, is a belt of rich alluvial country, varying from five to fifty miles in width, running right along the States of Perak and Selangor. On this country the greater part of the European and native cultivation has taken place. The soil is a rich black or a greyish loam, eminently suited for intense cultivation, and of great depth. In some of the low-lying districts a considerable area is covered with a deposit of peat, sometimes to a depth of several feet, this land is of little value unless it has been drained for some years, and sweetened by exposure to the sun.

If the whole of this rich belt of country is to be utilized to the best advantage, an important draining problem will have to be solved by the Government. When the soil is properly drained the growth of many products is wonderful, equalling in results the most fertile of tropical countries; but a considerable proportion of it is flat country only a very few feet above sea level, and unless it can be drained the deeper soil is valueless, and these low-lying portions are therefore useless for plantations of big trees that strike their roots deep into the soil.

In any case, both on the east and west coasts, there are millions of acres of splendid soil suitable for all tropical products that do not require to be grown at an elevation.

Speaking generally, the mountain soils at an elevation of over 1,000 feet are somewhat poor, though there are notable exceptions to this general statement. Moreover, the hills are so steep that if cleared of native vegetation they would become denuded of soil owing to the heavy rains, and as there are very few plateaux or rounded valleys, they are therefore of little use. All efforts are being concentrated on the production of those economic plants that flourish best at or near the sea level. In Java and Papua, on the contrary, excellent soils are found at considerable elevations, and these countries are therefore capable of producing a much more diversified range of economic plants.
Climate.

Although the Federated Malay States are situated only a few degrees from the equator, the climate is modified and rendered less oppressive than that of other lands in the same latitude by reason of its geographical configuration. The Malay Peninsula, being a narrow neck of land, in no place more than 180 miles wide, has an insular or oceanic rather than a continental climate. The distinguishing feature is an almost total absence of seasonal variations, the difference in temperature between the winter and summer being only about 3 degrees, and the climate, except when affected by elevation, shows little variation in any locality. Notwithstanding the continuous heat and excessive humidity, the health of Europeans is generally good. The average mean temperature in the shade is from 80 degrees to 85 degrees F., and the temperature at night from 70 degrees to 75 degrees F.

Rainfall.

The States enjoy an even, plentiful and well-distributed rainfall, admirably suited for the growth of most tropical products. The average rainfall in the elevated regions varies from 100 to 200 inches per annum, while in the less elevated and drier parts it ranges from 70 to 100 inches.

While an evenly-distributed rainfall is generally speaking a distinct advantage, the absence of any period in which fine weather can be relied upon renders the country unsuitable for those plants, such as cotton and tobacco, that require a dry spell while the product is ripening and being harvested. The Federated Malay States are within the monsoon region, although the rainfall does not vary greatly. The months with the greater rainfall generally speaking are April, May, September, and October, while January, February, June, and July are somewhat drier, but the rainfall of any month cannot be depended upon.

Population.

The population of the Federated Malay States at the last census (1901) was 678,000. It is now estimated to be 880,900, and comprises the following nationalities: — Chinese 400,000, Malays 392,000, Hindus 80,000, Europeans 2,500, Eurasians 3,000, other nationalities, 3,400. The immigrant races have been attracted or introduced for industrial purposes, such as mining, planting, and domestic service, and are mostly hired labourers. This accounts for the great discrepancy in numbers between the sexes. At the last census the numbers were as follow:

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europeans</td>
<td>1,011</td>
<td>411</td>
</tr>
<tr>
<td>Eurasians</td>
<td>8,27</td>
<td>665</td>
</tr>
<tr>
<td>Chinese</td>
<td>272,584</td>
<td>27,155</td>
</tr>
<tr>
<td>Malays</td>
<td>164,532</td>
<td>146,607</td>
</tr>
<tr>
<td>Tamils</td>
<td>44,766</td>
<td>13,443</td>
</tr>
<tr>
<td>Other races</td>
<td>1,353</td>
<td>1,299</td>
</tr>
<tr>
<td>Floating Population</td>
<td>2,547</td>
<td>86</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>487,600</td>
<td>189,508</td>
</tr>
</tbody>
</table>

Diseases.

For a tropical country the climate is fairly healthy for Europeans, provided reasonable precautions are taken, and common sense is used in dress and diet. Malarial fever is not uncommon, but the type is usually of a mild nature. Typhoid fever breaks out occasionally, and diarrhoea and dysentery are of frequent occurrence. Cholera amongst Europeans is hardly known. One of the most deadly diseases amongst the natives is beri beri; this is believed to be caused by a minute fungus on the rice, as natives who live on locally-grown rice that has not been stored for a long time are almost exempt.

Labour.

Next to soil and climate the most important factor in the economic development of a tropical country is the labour supply. Generally speaking the native races of the tropics are indolent and slothful; nature has provided them with such a rich soil and forcing climate that their few requirements are easily satisfied with the produce of the forest, supplemented by a few planted fruit trees, or a small plot in which rice or root
crops are grown. The chief exception to this general hardship, so far as voluntary work is concerned, is to be found in those countries where the density of population (as in India, Ceylon and Java) has necessitated increased exertion, and more intense and careful culture.

One of the most difficult problems confronting the European ruler, in a tropical possession, is to induce the natives to accept voluntarily continuous labour.

The British have generally solved the problem of tropical development by importing alien coolie races, principally from India and China, to initiate and develop industries.

The Dutch, in Netherlands-India, on the other hand, resisted all attempts to introduce other coloured races to work on the plantations, and had recourse to certain compulsory methods, such as the "Corvee" and "Culture" systems, which were maintained until the habit of industry began to crystallise into a race characteristic, and until the population by natural increase became so numerous that the struggle for existence, becoming more severe, necessitated continuous labour to supply the wants of the family.

The British system is well exemplified in the Federated Malay States; in the early stages of the Protectorate tin mining was practically the only industry, and the authorities gave every inducement to large numbers of Chinese coolies to come and work in these mines. Within the last few years Indian coolie labour has been attracted to develop the plantation industries.

The Malay.

The Malay, like the members of most other equatorial races, where population is sparse and nature bountiful, is not industrious. His efforts are usually limited to somewhat desultory cultivation, to the collection of forest produce, and to fishing, and boat work, for which he shows a great aptitude. He evinces no desire to become a "commercial" agriculturist; if his crop is exceptionally heavy, and his supply of food consequently large, he is not anxious to plant again until his supplies are beginning to run short.

The British administration has always treated the Malay with sympathy and generosity, and so far as personal comfort is concerned he is in an immeasurably better position than when under the undisputed sway of the Sultans. The British have given him security for life and property, a condition unknown before, when his wives and daughters, as well as his orchards, were at the mercy of the Rajahs and Sultans. He has been freed from arbitrary taxation, forced levies, and the system of "Krah" or forced labour. He has a secure title for his land, of which no one can dispossess him unless with his consent. Means of communication have been opened up for him by the construction of bridle-paths, roads and railways, and a market provided for his labour and produce. Free education has been provided for his children, free hospitals and medicine when sick, while the scourges of small-pox and cholera have been largely minimised. To encourage thrift Savings Banks have been established, in which he can safely deposit his savings at interest. Law and order have been established, and the legal rights of all, from Raiat to Rajah, are equal.

The policy of the British Advisers has been to interfere as little as possible with the native laws, manners, customs, habits, and Mohammedan religion, while some effort has been made to improve the Malay's standard of living by draining and irrigating his rice lands in certain places, and by improving the quality of his cereals.

While all this is excellent, and in accord with the highest traditions of British rule, it cannot, I think, be denied that the Malay has relapsed into greater sloth and indolence as a direct result of British rule, while the Javanese peasant, who is the same as the Malay in race, religion, and custom, is a more industrious and frugal individual as the result of Dutch rule.

Formerly the heavy exactions of the Malay rulers forced the peasant to produce considerably more than was sufficient for his own requirements, while the manufacture of agricultural implements, warlike weapons—in many of which great care, skill and labour were involved—the production of clothing, pottery, baskets, brass and silver ware, necessitated a life of considerable industry, which was not lessened by the almost continual wars amongst the various Sultans.

The beautiful and distinctive Malay art is now almost a thing of the past, although an effort is being made by Mr. E. W. Birch, C.M.G., the British Resident of Perak, to resuscitate it by the establishment of an Art School at Kinta Kangsar.
These native manufactures have been superseded by cheap importations which can be purchased for a few pence, while the cultivation has shrunk to the requirements and necessities of the family.

While the system of forced labour for the benefit of the rulers cannot be defended, there is little doubt that the introduction of coloured alien races to do the mining and estate cultivation simply accentuates that sloth and lethargy to which the tropical races are prone, and has the effect of deteriorating the natives both mentally and physically.

It will naturally be asked, "How are the tropics to be developed if neither of these methods is admissible, and the native races refuse to work? Are the struggling millions of the world to be deprived of the benefit of the enormous food supply that can be grown on the rich and often sparsely populated heat belt? Are great tracts of the most fertile land in the world to lie idle and useless, inhabited by a few indolent natives, or should they contribute their fair quota to the world's food supply?"

These most difficult questions can, I think, be partially solved by the application of a method introduced by Sir William McGregor, when Governor of Papua. This system will be dealt with in the chapters of my report devoted to that territory.

After a short resistance to the incursions of the Chinese and the Europeans, the Malay submitted to the government of the white men who freed him from the tyranny and oppression of his own government, and, retiring to the recesses of the jungle, listlessly contemplated the yellow man and the black man developing the industries of his country. This condition of apathy, transmitted from generation to generation, gradually produces a type or race-characteristic that it is most difficult to overcome: just as conversely the congested condition of a tropical district will compel the natives to habits of industry. And the more strenuous life transmitted through a long period will often survive when conditions have so altered that labour is optional rather than imperative.

The Chinese.

The Chinese are numerically the dominant people in the Federated Malay States. Their advent has been encouraged and assisted by the rulers, because, coming from a temperate region, the Chinaman is the most industrious and intelligent of all the coolie races. Without doubt the wonderfully rapid industrial expansion of the Federated Malay States would have been impossible without the yellow man. From an industrial standpoint, therefore, the end has amply justified the means. Whether that verdict will equally apply from the point of view of national policy, or judged by an ethical standard, I am inclined to doubt, but the subject is too large to be discussed here, and is in any case beyond the scope of this report.

While the rapid expansion of the mineral resources of the States has admittedly been due to the employment of Chinese labour, it is impossible to believe that these rich stanniferous deposits would have remained undeveloped without the importation of coolie labour. The process would undoubtedly have been more gradual, and possibly expensive, if hydraulic sluicing and the most modern labour saving appliances had been instituted instead of the primitive methods at present in vogue; but as a compensating advantage the mines would have been largely owned by the white inhabitants instead of the Chinese, and a larger proportion of the enormous wealth produced would have been retained by the native and governing races instead of finding its way to China or creating Chinese millionaires within the States.

Of the 400,000 Chinese in the Federated Malay States the great majority are engaged in mining operations and secondary industries connected therewith, such as store-keeping, money-lending and trading. Comparatively few have so far engaged in agriculture, because in the past it has been less profitable than the other vocations; but they are now devoting increased attention to the growth of sugar, coconuts, and rubber. The Malay, in the Federated Malay States, is not prohibited from selling his holding to races of another nationality, as is the case in Java, and Papua; and if the Chinese devote a large amount of attention to commercial agriculture there is a danger of the easy-going Malay being deprived of his birthright and the only asset he possesses.

The number of Chinese working in the tin mining industry is about 200,000. Some of these are indentured labourers, but the majority are working under contract
or tribute. That the number of indentured labourers is rapidly decreasing the following figures indicate:

<table>
<thead>
<tr>
<th>Year</th>
<th>Indentured Men</th>
<th>Contract or Tribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>1903</td>
<td>...</td>
<td>65,956</td>
</tr>
<tr>
<td>1904</td>
<td>...</td>
<td>50,558</td>
</tr>
</tbody>
</table>

The rates of wages paid to indentured labourers are usually lower than those given to free labourers, but experience has shown that free labour gives better results than indentured labour when the employer is a European.

**Indenture System.**

The system of engagement by indenture of labour from China is now almost exclusively confined to the Chinese Tow Kays or industrial magnates. Their wages are from 9s. 4d. to 11s. 8d. a month, with food and clothing. The outlay in respect of each coolie imported is from £3 to £7, and this is ultimately recovered from them, so that the first year’s wages are hardly sufficient to pay their immigration expenses. Until this debt is paid off the coolie is kept in a compound, as in South Africa. In fact the Chinese compound system on the Rand mines was modelled on the system in the Federated Malay States, and inaugurated by a State official from the Malay States, who was borrowed for one year and a half by Lord Milner. As the “sinkel” or indentured coolie is cheaper than the “loukell” or free labourer, it is to the advantage of the Chinese mine-owner to retain him in that condition as long as possible; he is therefore allowed to obtain opium and other luxuries on “credit” if he desires; and by this means his ransum remains unpaid, and his indentured tenure is prolonged. The food is principally rice, with perhaps a little curry or dried fish, the bedding a straw mat and a pillow, and the clothing a straw hat and a loose blue loin covering in shape like loose running-drawers—a very suitable dress for coolies in such a climate.

**Free Labour.**

None of the Chinese miners are paid a daily wage. The free labourers either work under contract or tribute, or under a co-operative system.

The contract system is the one usually employed by white mine-owners. He arranges his contract with a Chinese “boss,” who employs the labour and carries out the work.

The method of working the mines is to remove the earth covering the tin-bearing stratum. This is called the “overburden,” or “stripping.” The tin-bearing layer or wash-dirt, is then carried to the surface and thrown into the sluice-boxes. The wash contains one or two per cent. of ore on an average. The price paid for removing the earth and wash is generally £1 3s. 4d. to £1 8s. per chun, that is, an area measuring 30 feet by 30 feet, having a depth of 14 feet, and containing 50 cubic yards. The ground is loosened by large hoes called “changkols,” and the earth is filled into baskets, two of which are carried on a yolk or stick by each man up an inclined board, with cleats nailed across it, to the sluice.

In the tribute system, the mine-owners (British or Chinese) enter into an agreement with the “boss,” by which the members of the gang are entitled to all the tin ore they obtain, but they must sell this to the mine-owner at a price considerably less than the market value.

Perhaps the method most frequently adopted in Chinese-owned mines is one known as the co-operative system, where all the coolies are entitled to a share in whatever profit is made after re-paying the loans advanced by the money-lender (usually the owner of the ground) and paying for food and other necessaries.

The Chinese mines are worked on the truck system, all food, clothing, tobacco, opium, &c., being supplied by the mine-owner. The profits on these sales are naturally large, and often pay a dividend on mines that would otherwise he worked at a loss.

**Tamil Labour.**

While the Chinaman is the most industrious of the coolie races, it does not follow that he is fond of work, his energies are stimulated by the love of gain, and in
order to obtain the best results his reward must be according to the work accomplished and not by the term of service. When engaged at day labour his deliberation is marvellous, and the work accomplished infinitesimal, for this reason he is unfitted for those avocations, such as plantation work, in which the labour cannot be done by contract.

The immigrant race next in importance to the Chinese is the Hindoo bailing from the southern parts of the Madras Presidency in India, known as the Tamil or "Kling." They are a docile people, more amenable to control than the Chinese, and work fairly well as day labourers. They form the bulk of the large labour force employed by the Government in public works, road making, and maintenance, and are almost exclusively employed on the plantations. Many have also settled as traders, and some as agriculturists. In the Krim irrigation district 305 Tamils own 2,000 acres of irrigated rice land. Like the Chinese, they leave their women-folk behind, and generally return after a few years, taking their savings with them. Another class of Tamil, known as Chetties, are numerous money lenders.

At present there is a great demand for Tamil labour to work the rubber estates that are springing up everywhere, and the Government are doing all they can to stimulate the introduction of this class of labour.

An Indian Immigration Department has been established, and last year 8,000 free passes were issued by the authorities to intending immigrants. The number of Tamils and other Hindus at present in the Protectorate is 80,000.

The system of indenture, as applied to the importation of Indian labour has practically been discontinued, as employers find that the better system is to engage free Tamil labour in India at an initial cost sufficient to pay their passage money and a small advance. The outlay is usually about £2 5s. per head, which is subsequently repaid by the coolie. The wages paid are from 6d. to 10d. a day, in addition to house accommodation.

The Javanese are not numerous in the States, they are good workers, and especially useful at gardening, drain making, and irrigation.

The few Bengalis in the Protectorate are usually employed as cart drivers.

The wages of domestic servants are—
Indoor servant, 23s. to 35s. a month.
Cook, 23s. to 35s. a month.
Water carrier, 16s. 6d. to 23s. a month.
Gardener, 18s. 6d. to 23s. a month.
Syce (groom), 21s. to 28s. a month.

CHAPTER IV.

General development.—Agricultural extension.—Mining development—Exports of produce.

General Development.

The Federated Malay States, although not much more than one quarter the size of Papua, present in many respects a striking analogy to our territory. Although in the northern hemisphere, the Malay States are nearly the same distance from the equator as is Papua in the south, the climate and rainfall are very similar, and while the soil is not, I believe, so uniformly rich as is that of our possession, it has enjoyed the advantage of a much superior steam-ship communication. The northern State of Perak was placed under British protection ten years before Papua, but it was not until twelve years later that the whole of the States were brought within the sphere of British influence, and while they have been somewhat handicapped by remaining a protectorate and not a possession, Papua has been actually annexed for eighteen years—or four years after the protectorate was established. At the advent of the British in the Malay Peninsula the population was less than the estimated population of Papua, and the native inhabitants were possessed of no greater industry, if as great. The country covered with dense jungle was quite as inaccessible, there were no roads, and practically the only communication with the interior was by means of the rivers, which are not navigable for any great distance. The natural conditions and the period of British occupation in both the territories show such a striking resemblance that an enquiry as to reasons for the enormous dissimilarity in their
economic development is a matter of the greatest interest and importance to the Australian people. On the one hand we find a small British protectorate so administered that the growth of its trade, commerce, and industries has been phenomenal, and its revenue greater than that of any other protectorate or any Crown colony in the British Empire, while in Papua there is no development, and there are no industries except a little desultory gold mining. The revenue is falling instead of expanding, and now constitutes less than one-half the cost of administration.

The Federated Malay States have been extremely fortunate in possessing exceptionally able administrators, such as Mr. J. W. Birch, Sir Hugh Low, and Sir Frank Swettenham, whose whole energies have been devoted to opening up the country and developing its latent wealth. There is a popular movement to erect a handsome statue to the memory of the first-named at the town of Ipoh. In Papua, with the exception of the term of office of Sir William McGregor, the Government has been merely a Big Policeman, maintaining excellent law and order, extending the administration and treating the natives with kindness and consideration, but doing nothing whatever towards removing those obstacles to settlement that private enterprise is powerless to accomplish. In fact, the harassing laws and regulations, the absence of information and assistance, combined with the natural inaccessibility of the country, have defeated all efforts of would-be colonists to develop the possession.

The causes of the success that has crowned the efforts of the rulers in the Federated Malay States are not far to seek if we follow the trend of their legislative and executive actions. Having established law and order, and created good law and mining laws, the first efforts of the Government were directed towards making cart roads and bridle tracks to the rich mineral centres, and to those fertile agricultural lands that were most accessible. This has been in all tropical countries the genesis of successful development, because whatever may be the potentialities of a mining district or the agricultural possibilities of a country, they are equally useless and valueless so long as they are inaccessible. The enormous tin deposits of the States of Perak and Selangor could not be developed until reasonable facilities for their exploitation had been afforded by the Government. Latent wealth and accessibility were the magnets that attracted immigrants and capital, and the stream of wealth thus produced has provided the Government with a new of war to penetrate the jungle and lay bare the hidden riches of the land. Bridle tracks were superseded by roads, and these in many places gave way to railways. Handsome towns and palatial public buildings have sprung up where previously were trackless forests or squalid kamponds.

The Government has constructed 1,586 miles of metalled roads, many of which have been made through most difficult country, requiring considerable engineering skill and a large expenditure. These roads have been so well made that they are suitable for motor car traffic. On my visit to the State of Pahang, I was driven over the main range at an elevation of 2,700 feet in an 18-horse power motor car. These roads are supplemented by 1,000 miles of bridle tracks. The railways have been laid down on the metre gauge; 421 miles have been constructed at a cost of £11,000 per mile, including buildings and rolling stock, or a total of £4,631,000 upon which they earn 4½ per cent. To this must be added 25 miles of line, owned and worked by a subsidized private company. The Government is now building a line through the State of Johore, a distance of 120 miles. This line when completed will connect Singapore with Penang, a distance of 480 miles. The passenger rates are:—First class, 1½d. per mile; second class, 1d. per mile; third class, ½d. per mile. As a feeder to these lines there is a subsidized motor car service running from Kual Lumpur to Kula Lipis, that has proved a most useful adjunct to the general travelling facilities. The all important problem of transportation has, in spite of natural difficulties, been successfully solved by the administration. They have built 1,231 miles of telegraph lines, which connect all the principal centres. During 1901 £640,000 was spent on public works, of which 7½ per cent, represented salaries. A well equipped pathological institute has been built at Kaula Lumpur, the capital, for the scientific study of tropical disease, such as beri beri, malaria, dysentery, tuberculosis, glanders, and rinderpest. Three medical men are engaged in this useful work, and various publications containing the results of investigations are published from time to time. There are 31 free hospitals established in various parts of the States, and during 1901, 46,415 in-patients were admitted, and 139,251 out-patients were treated. The doctors, some 50 in number, are all paid by the State, though
private practice is allowed. At all the railway stations, and at distances of a day's journey along the roads are very interesting and novel institutions called "Rest houses." These, about 30 in number, are substantial wooden houses, with good well-furnished rooms. They were erected and are owned by the Government, and are really State hotels. The meals are good and the charges moderate. Sixty "halting bungalows" have been also erected by the Government in the more remote parts; in these meals, refreshments, or attendance are not provided.

The Government has erected bungalows as sanatoria at elevations varying from 1,500 to 4,000 feet amongst the hills. They are well furnished, and can be hired by those whose health requires a cooler and more bracing atmosphere.

There are two excellent museums at Taiping and Kaula Lumpur, in which are most interesting displays of the fauna of the country and the native art of the Malays and aboriginal tribes.

Great care and attention have been devoted to education. The number of Government free schools throughout the States is 252, with 13,128 scholars; of these 232 are Malay Vernacular Schools, and in 20 English is taught to 2,331 pupils.

The Malay language is written in Arabic characters, and efforts are now being made to simplify matters by substituting Roman characters and adopting a phonetic basis for the spelling, except for words derived from a foreign language.

Savings banks have been established in various centres. These are managed and guaranteed by the Government. Deposits from one to 500 dollars are received, and interest allowed at the rate of 3 per cent.

The Chartered Bank of India, Australia, and China, has two branches in the Federated Malay States, which undertakes all kinds of banking and exchange business.

The unit of currency in the Federated Malay States is the dollar, which has now been standardized at 2s. 4d. Other silver coins are 5, 10, 20, and 50 cents pieces, and copper coins are issued of the value of one cent and a half cent. Currency notes are issued for varying amounts by the Government of the Straits Settlements, aggregating 17,000,000 dollars; against this there is a reserve of 11,000,000 silver dollars and a gold reserve equal to 6,000,000 dollars.

All the printing required by the Federal Government is carried out at the State printing works at Kaula Lumpur.

Besides a large staff of revenue surveyors the authorities have instituted a Trigonometrical Survey Department, under capable officers. During 1904, the expenditure under this head was £9,500, and is likely to be increased in the future.

All the public works have been constructed, all these institutions erected, and all these services maintained out of revenue, yet, in spite of the large outlay necessitated there is no public debt. The Government has a good credit balance, and has invested some of its surplus in outside securities. At the beginning of 1905 these were:—Consols and Colonial Funds, £554,537; Indian Government, 3½ per cent. stocks, £20,000; 2,931 shares in the Tanjore Pagar Dock Co., Singapore, £92,000; loan to the Straits Settlements, £70,000; and as none of the lands of the States have been alienated, the public assets are intact, except in the case of minerals won from the soil.

**Livestock.**

Most of the stock in the Federated Malay States has been imported. All the horses, with the exception of ponies, are brought from Australia; the ponies principally come from India, Birmah and the Dutch Islands. Australian horses for riding and driving average from £10 to £50, ponies from £12 upwards. Cattle are principally used for draught purposes, and are of three kinds—Bengal cattle, Siamese cattle and water buffaloes. Bengal cattle are worth from £12 to £20. Siamese from £9 to £18. Buffaloes are used almost exclusively by the natives. The meat is of poor quality and the cattle are poor milkers. As in most tropical countries there is little or no good grazing land owing to the principal grass called "lalang," being too coarse for fodder. Stock breeding has, as yet, received little attention, as it is generally considered the country is not suitable for that industry. A large number of sheep and goats are imported for butchering purposes, and goats of an inferior quality are bred by the Malays.
A Government Veterinary Department has been established, and its labours are mainly directed towards the prevention of diseased stock being imported. This is attained by a rigorous inspection at the ports of entry.

AGRICULTURAL DEVELOPMENT.

The total area of the Federated Malay States is 16,800,000 acres, of which 605,092 acres have been leased for agricultural purposes under perpetual tenure, and 350,000 acres are actually under cultivation. The following are the principal crops:—

- Rice, 112,000 acres
- Coconuts, 87,000 acres
- Rubber, 30,000 acres
- Coffee, 19,000 acres
- Gambier, 22,000 acres
- Sugar-cane, 18,000 acres
- Tapioca, 17,000 acres
- Pepper, 3,500 acres

In order to stimulate these industries and create others a Director of Agriculture and Government Botanist was appointed last year. Mr. J. B. Carruthers, F. L. S., who was selected for this position, has had an extensive experience of tropical agriculture, gained principally in Ceylon. Under him is a staff of officials comprising the Superintendent of the Experimental Station at Batu Tiga, near the capital; the Curator of the Hill Gardens and Government Plantations near Taiping, and an inspector of coconut trees. It is intended to shortly supplement this staff by the appointment of an agricultural chemist, who will be engaged in analyzing soils, conducting experiments in connexion with rubber production and other matters, and an entomologist to study insect pests, fungi and other injurious vegetable growths that are destructive to the plantations.

The superintendent of the experimental gardens at Batu Tiga (some 70 acres in extent) is chiefly engaged in carrying out extensive experiments in connexion with Para rubber growing, the selection of seed from specially vigorous or large latex producing trees, the best methods of cultivation, modes of tapping, &c. As all other plantation industries are being temporarily neglected on account of the rubber boom, special attention is naturally being devoted to this subject. The Lagos silk rubber and Para rubber have also been experimented with, but the results are not encouraging. The cultivation of cotton—Egyptian and Sea Island varieties—has proved a failure owing to the unsuitability of the climate.

At Kaula Kangsar, in the State of Perak, there is another Experimental Garden, and near Taiping a hill garden, situated at an elevation of 1,600ft. These are under the supervision of a curator, and are carried on at a cost of £2,400 a year. They have proved of value in stimulating rubber culture, and in the distribution of fruit trees. Experiments in the hill gardens have also shown that the tea bush will grow as well as in Ceylon and India, and probably yield well, but as there is little ground in the Federated Malay States suitable for those cultures that require to be grown at an elevation, the usefulness of the hill garden in the encouragement of estate plantations is problematical; at the same time fresh vegetables and fruits of a colder climate can be grown here, and in this respect the garden should fulfil a most useful purpose.

At Singapore, and Penang, in the Straits Settlements, are excellent botanical gardens, and in these are numerous experimental plots containing many varieties of fruit trees, plants from which oils, drugs and dyes are extracted, fibres, rubbers, and various species of tea and coffee plants. These gardens are under the able direction of Mr. H. N. Ridley, M.A., F.L.S., who has done much to encourage plantation culture in the Peninsula.

Under excellent land laws the Administration uses every endeavour to assist the planter in developing the industries of the State. Not the least important result of this policy is the celerity with which applications for land are granted. Within a few days, or, at the most, weeks, the applicant can secure a perpetual lease of the ground he desires to possess and cultivate; provided, of course, the land is not required by the natives or for State purposes. To further assist the agriculturist the Government, if he desires, will advance him sums of money up to half the value of the property, charging interest at the rate of 6 per cent. This is a great boon to the settler, and assists development, as the interest charges on private loans are very high in the States.
To encourage new agricultural industries a planter who grows new products not under general cultivation is exempted from export duties.

Owing to the copious and well-distributed rainfall in the Federated Malay States irrigation is, generally speaking, unnecessary, except for course for rice cultivation. Roughly speaking, an average Malay family will consume from 2,400 to 3,000 lbs. of rice per annum. As the local supply is not equal to the demand more than half a million pounds' worth has to be imported every year.

In order to assist the Malays and increase the local production the authorities have carried out irrigation works in several places along the coast. By far the most important of these is that known as the Krian Irrigation Scheme in the extreme north-west of the protectorate. To irrigate this area of 100 square miles cost £150,000. The experiment can hardly claim to be a thorough success; although the scheme was undertaken purely for the purpose of rice cultivation, a considerable portion of it was leased without any stipulation as to the nature of the crop grown upon it, and although rice was at first cultivated much of the land has fallen into the hands of Chinese who are planting sugar thereon, and injuring the canals by dragging about their sugar barges in them. The remainder of the land is now being cased with the proviso that it is to be used exclusively for rice culture.

In leasing land for cultivation in the earlier stages of development a mistake was made in not making provision for roads; the consequence is that the leaseholds along the sea or river frontages or abutting on main roads cut off all access to the "hinterland" estates that have been subsequently taken up. This should be borne in mind by the Administration in Papua, so that in granting leaseholds, frontage and cross roads should be reserved not more than a mile apart.

A very informative and well-written handbook of the Federated Malay States has been issued by the Government, containing information of value to the planter, miner, business man and tourist, including particulars of the climate, the various Government services, cost of living, and hints as to diet and dress. It is illustrated with useful maps.

During 1904, Dr. John C. Willis, F.L.S., Director of the Botanic Gardens, Ceylon, paid a visit to the Federated Malay States, and at the request of the Government furnished a report on the most promising industries from a capitalist's point of view. In his able report he stated:—

"So far as the particular case of the Malay States is concerned it seems doubtful if any important industry other than coffee, sugar, rice, coconuts, tapioca and rubber is likely to be discovered for some time. After all this is a good and varied list, and it is better to make the best of those we have than to be continually looking out for new ones to take their place."

He considered the most promising enterprises from the capitalist's point of view to be rubber, sugar, and coconuts, in the order named, and from the small holder's point of view, coconuts, sugar, tapioca, rice, pepper, and rubber.

Although the present prospects of agricultural expansion in the Federated Malay States are of the brightest, the history of its initiatory stages has been beset with difficulties, and often marked with failure. Since 1830 considerable sums have been invested and sometimes lost by European and Chinese in pioneer planting. At first it was mainly pepper, coffee, gambier and rambutan, all of which were failures or partial failures. Ten years ago there was almost as great a boom in coffee planting as there is now in rubber, but over-production in other countries and the resultant drop in prices rendered the industry almost unpayable. These industries were largely succeeded by sugar, coconuts, tapioca, and rubber, all of which give every promise of successful expansion.

Besides these e-state cultures there are valuable forests under the control of a well-organized Forest Department, amongst the most important timbers may be mentioned the following varieties:—Dipteryx philandria [Chengal], Aiphan Sp [Merlan], Soerabawoos Hokomauis [Kumal], Suta An Rebyry [Tampinu], Keyron Peruggua [Temblau], and Stranguma Javuicui [Petaline]. The colloquial names are in brackets. Other natural products of the forest are gutia-percha, rubber, rattans,
including the well known Malacca cane, and trees yielding vegetable oils and resins. With a view of protecting some of the most valuable timber, forest reserves have been proclaimed aggregating 259,000 acres.

The two most highly prized Malayan fruits are the durian and the mangosteen. Fruits. The former possesses a most offensive odour, but the flavour is delicious. Although many Europeans cannot overcome their effluvia prejudices, the people of Eastern nationality are slaves to its seductive qualities. The flavour in which this fruit is held is not confined to the human family, as bears, squirrels, elephants, cattle, goats, horses, dogs, monkeys, and, if we can believe the Malays, even tigers show a great partiality for the fruit. The mangosteen has a pleasant, delicate, and characteristic flavour that makes it a great favourite amongst all races. The other well known fruits are mangoes, langsat, machang, tanumpi, granadillas, rambai, shaddock or pomelos, chiku, tamboi, bananas, melons, limes, oranges, pineapples, duku, rambutan, pulasan, papaws, guavas, jackfruit, sweet sop, sour sops, and custard apples. Fruit in the tropics is not merely a luxury but a necessity, and without a good supply of ripe fruit the health must suffer, although the climate is often wrongly blamed for resultant debility.

Papua is very badly provided with good fruits of any kind. A few bananas of inferior and coarse flavour, papaws, and an occasional orange, make up the sum total of its present fruit supply. It is very probable that the health of the white community would be much improved if the best and most easily grown tropical fruit trees were obtained and planted in those parts of the possession where the white population has settled.

Mineral Development.

The Federated Malay States owe their wonderful development and their present prosperity principally to their rich tin fields, but these only yielded up their hidden wealth through the unremitting energy of the Government in affording every reasonable facility for labour and capital to develop them. Three years after the advent of the British the revenue from the tin-fields only amounted to £14,000, a sum no larger than the present revenue derived from our undeveloped gold-fields in Papua. If they had adopted the same laissez faire attitude as our administration has done, if they had made no roads and afforded no facilities, their present development would have been no further forward than is ours.

The principal tin fields are situated in the States of Perak and Selangor, although every State contributes a quota to the yield. The output of tin in 1894 was 858,288 pikuls (a pikul = 133 lbs.) as compared with 841,953 pikuls in 1903, the value of the tin exported in the latter year being £6,213,121, representing about 74 per cent. of the world's output. Alluvial tin mining by hydraulic power has been introduced by Europeans with success, and an electrical process has been started by a French company at Ipoh. Most of the tin, however, is obtained by the most primitive methods on account of the cheapness of the labour. The Tronoh Mines Limited, situated eighteen miles from Ipoh, employ 2,000 men. With a capital of £160,000, their returns are 3,500 pikuls per month, the wash averages 25 kati (kati = 1½ lbs.) of tin ore (70 per cent. tin) to the cubic yard. The dividends declared last year amounted to £100,000. This is claimed to be the largest tin mine in the world. The manager and all the shift bosses are Australians, and the shareholders are Chinese.

Gold-mining is not a very important industry in the States. The Ramb gold-mine, situated in the State of Pahang, is the most important, and is responsible for the major portion of the output. This mine was discovered and developed by Australians. For the year 1904, 13,925 oz. of gold were won, valued at £71,564.

The following metals have also been found in the different formations:—Lead, Minerals. iron, tungsten, titanium, silver, zinc, copper, manganese and bismuth.

The total area of mineral country held under lease is 365,524 acres.
The following were the principal articles of export for the year 1904:

<table>
<thead>
<tr>
<th>Article</th>
<th>Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areca nuts</td>
<td>704</td>
</tr>
<tr>
<td>Banana Flour</td>
<td>952</td>
</tr>
<tr>
<td>Blacken</td>
<td>982</td>
</tr>
<tr>
<td>Coffee</td>
<td>3,410</td>
</tr>
<tr>
<td>Copra</td>
<td>976</td>
</tr>
<tr>
<td>Fish (dry and salted)</td>
<td>1,470</td>
</tr>
<tr>
<td>Gambier</td>
<td>1,555</td>
</tr>
<tr>
<td>Gold</td>
<td>20,157 ounces</td>
</tr>
<tr>
<td>Gutta percha</td>
<td>52</td>
</tr>
<tr>
<td>Hides</td>
<td>186</td>
</tr>
<tr>
<td>Indigo</td>
<td>407</td>
</tr>
<tr>
<td>Paddy</td>
<td>11,024</td>
</tr>
<tr>
<td>Para rubber</td>
<td>6</td>
</tr>
<tr>
<td>Pepper</td>
<td>547</td>
</tr>
<tr>
<td>Pigs</td>
<td>4,921 in number</td>
</tr>
<tr>
<td>Rice</td>
<td>318</td>
</tr>
<tr>
<td>Sugar</td>
<td>20,467</td>
</tr>
<tr>
<td>Tapioca</td>
<td>8,395</td>
</tr>
<tr>
<td>Tin</td>
<td>19,110</td>
</tr>
<tr>
<td>Tin ore</td>
<td>31,735</td>
</tr>
</tbody>
</table>

CHAPTER V.

PLANTATION INDUSTRIES.


RUBBER.

At the present phenomenal price of rubber the returns from a first-class plantation of well-grown para trees are something like 300 per cent. per annum on the capital invested, and there is, therefore, little reason for surprise that many tropical countries are smitten with the rubber fever. But for those who contemplate planting, the probable price of rubber ten years hence is the true crux of the position. It may not, therefore, be unprofitable to review the whole question from that standpoint, and fortified with some knowledge of the present position, to endeavour to form a rough estimate as to the limits within which the industry is capable of expansion and the probable growth of rubber consumption.

The world's output of rubber for 1905 was approximately 61,000 tons. This yield can be apportioned as follows:

<table>
<thead>
<tr>
<th>Source</th>
<th>Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>From Brazil (including Peru and Caucho)</td>
<td>34,420</td>
</tr>
<tr>
<td>From West Africa (including the Congo)</td>
<td>17,500</td>
</tr>
<tr>
<td>From Central America and Mexico</td>
<td>3,200</td>
</tr>
<tr>
<td>From East Africa, Ceylon, Malaya, and all other sources</td>
<td>6,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>61,120</strong></td>
</tr>
</tbody>
</table>

Taking the average selling price at 4s. a lb., this represents the value of the annual yield as £27,381,000. Of this it is questionable if the contribution of estate or plantation rubber is more than £1,500,000. In other words, of the world's output, forest rubber represents 94 \frac{1}{2} \text{ per cent.}, and cultivated rubber only 5\frac{1}{2} \text{ per cent.}

In the next decade, however, we are likely to see these proportions substantially reversed.
Forest rubber, if not threatened with extinction, is at any rate liable to become largely diminished owing to the method of treatment to which forest trees are subjected. Forest trees that are the common property of the inhabitants are bled by rubber hunters to the last drop of latex, and they are thus bled and often hacked to death. A rubber collector knows full well that if he only taps the tree to an extent that will not ruin the industry, some other person will probably come along and avail himself of the remainder. The tendency is, therefore, ruthlessly to destroy these valuable forest trees, and to cripple this source of supply. At the same time para trees are particularly hardy, and their vitality is such that they are not easily destroyed. There are also considerable forests of rubber in the hinterlands of Brazil, and the Congo, that have hardly as yet been touched. Furthermore, it is possible that those States that are threatened with the extinction of a valuable industry, will protect large areas of timber country in which para trees are growing by proclaiming them State forests, and will regulate the tapping by placing it solely in the hands of State officials; although in wild and unsettled countries such a system, while theoretically easy, would be found difficult in practice.

In any case it is evident that plantation rubber will not only have to take the place of forest rubber largely, but will also have to provide for the ever-expanding industrial demand.

In pursuing this inquiry, the next important factor is to define the geographical limits within which plantation rubber can be successfully cultivated.

Para rubber trees are possessed of enormous vitality and great adaptability, and will grow almost anywhere in the tropics; but they produce the best results (1) in tropical countries that enjoy a heavy and evenly distributed rainfall; (2) at an elevation ranging from sea level to 800 feet; (3) in a rich, friable, and well drained soil.

While the first of these limitations disqualifies all tropical countries within the regular monsoonal belt from being ideally suitable for rubber culture owing to their possession of a dry season, and also all those countries in the tropics where the rainfall is small, it does not by any means follow that rubber cannot be successfully cultivated in those regions, although the returns will be less bounteous. As an instance, rubber is successfully grown in Ceylon where there is a well-defined wet and dry season, but the trees do not appear to grow as quickly or to yield as well as in the Federated Malay States. I was shown cross sections of trunks of two rubber trees, both fourteen years old, and both grown in somewhat similar soil. The one grown in Ceylon was 12¥ inches in diameter and the other from the Federated Malay States was 16½ inches across. The latter tree, being more than a foot larger in circumference, would naturally produce more rubber other things being equal. The richness of the soil also, while important, is not imperative. I have seen a plantation of rubber trees in the Federated Malay States growing fairly vigorously on red laterite soil that is chemically poor, though a good mechanical soil. At the same time the trees were not so robust as those planted on the rich alluvial soils of the coast. The limit regarding elevation is also not prohibitory, as para rubber is grown with some success in Ceylon at an altitude of 4,000 feet.

Assuming, however, that the area of successful cultivation of rubber trees within the tropics is defined by the three above-mentioned limitations, it is evident that immense tracts of uncultivated territory are available for this industry—when we remember that the tropical belt is 3,000 miles in width and embraces a very large proportion of the land surface of the globe.

Having discussed the rubber-growing industry from the aspect of its possible development, the next important consideration is the probable expansion of the industrial demand for rubber. This question appears to me to be almost entirely governed by the market price. Even at the present extraordinary prices the demand is increasing. Stocks are low, and supply cannot overtake the requirements of the trade. Assuming that the price fell to three shillings or even two shillings a pound rubber growing would be a profitable industry in those countries best suited for its culture, provided land was cheap and the labour supply good. If such a shrinkage in price occurred owing to increased supplies, the demand for rubber would enormously increase, and fresh avenues for its expansion would be found. The rubber of the Malay States and the island of Borneo is not only cheaper to produce but its quality is proverbially better.
employment would be opened up in all directions. It is probable that the wheels of all vehicles used for human carriage would be rubber tyred, the amount of rubber used sparingly now in many directions, owing to its almost prohibitory price, would be largely increased, while the possibilities of its use for street paving and as a roof material for horses opens up a question of great importance.

In 1881, a road 11 feet wide near Euston station, in London, constantly used for horse and vehicular traffic, was covered with 2 inches of vulcanized rubber. This was taken up in 1902, after 21 years’ service, and it was found to have worn in the thinnest place to five-eighths of an inch in thickness. In other parts it was still from 1 inch to 1½ inches in thickness. It has also been successfully tried at Wellington Court, 42 Albert Gate, Knightsbridge, London. In a portion of the footpath in Princes-street, Edinburgh, rubber paving has been laid down for eighteen years without any repairs, while freestone paving blocks in another portion of the footpath have had to be renewed three times in that period.

My object in mentioning these instances is to show that while there is a possibility of an enormous increase in the supply during the next decade, there is a certainty of an immensely augmented demand if the prices of the commodity are reduced owing to large production.

In the opinion of experts the consumption of rubber would be quadrupled in ten years’ time provided there was a considerable reduction in price. This, I think, is a very conservative estimate.

Assuming that the demand for rubber increased fourfold, it is interesting to estimate what area of country would have to be planted to supply the whole of that demand irrespective of Forest rubber.

Assuming that the trees are planted in the most suitable districts, and that they are at least six years old, they should yield two pounds of rubber annually; old trees, under favorable conditions, often yield far more.

If 100 trees are planted to the acre it would require less than 3,000,000 acres to produce 244,000 tons of rubber, or four times the present supply. Mr. Carruthers, the Director of Agriculture for the Federated Malay States, estimates that there is a larger area than this available for rubber growing in the Federated Malay States alone.

Another factor that should not be forgotten is the possibility of some substitute being discovered or invented that would fulfil the same purposes as rubber. In spite of immense research no such substitute has yet been found, and probably never will be, although rubber for certain purposes has had many cheaper ingredients mixed with it.

It may be taken for granted that eventually the price of rubber must come down considerably, because whatever the increased demand may be rubber plantations will go on multiplying so long as the present enormous profits can be made. But rubber is an industry that requires six lean years to elapse before the profits commence, and the impossibility of estimating, even approximately, what proportions the increased demand is likely to attain, and the possibility of some substitute for rubber being discovered, combined with the large initial expense, will prevent many people from going largely into the industry. The history of all plantation products such as tea, coffee, sugar, cinchona, indigo, &c., is that they have all had their period of immense profits followed by largely increased production, with lower prices as an inevitable corollary. But rubber differs from all these, except perhaps cinchona, in the long period that must elapse before the plantation becomes revenue producing, and it is probable that for the next six or seven years rubber prices will be maintained, if not exceeded, owing to the increased demand, a failing forest supply, and the fact that most of the present rubber plantations will not become productive for some years. While I have no figures of very recent date of the area of estate rubber, at present the plantations do not, I should think, aggregate anything like 3,000,000 acres.

During the last twenty years the price of rubber has been subject to considerable market fluctuations. In 1885 the price was 28. 3d. a pound, in 1887 38. 2d., in 1889...
2s. 9d.; in 1890, 3s. 4d.; in 1892, 2s. 9d. During the succeeding seven years there was a steady increase until in 1899 it had reached 4s., from which it receded to 3s. 1d. in 1902. For the next three years prices advanced rapidly, reaching 5s. 8d., 6s. 6d., and 6s., respectively. It is at least significant that during the whole of this period the price of rubber has never receded to a figure that would make its production unprofitable, and it is unlikely in the future to fall to an unremunerative price in those countries where the conditions are most favorable to its culture.

So far as our information goes there is no country better suited for rubber growing than Papua. It possesses an immense area of rich, well-drained soil, rising from the sea level to an altitude of 800 feet, and the rainfall is heavy and evenly distributed. Another advantage of rubber cultivation is that it does not require skilled manual labour, and when once planted the maintenance expenses are small.

A para rubber tree six years old should bear at least 500 pods, each containing three seeds. These can be obtained from the Government experimental stations in the Federated Malay States at 5s. 10d. a thousand, but they must be ordered a year or two beforehand, as the present demand is so great.

On behalf of the Commonwealth I ordered 100,000 of these seeds for Papua, and they will be ready for shipment in September or October.

The usual way of forwarding seeds, if the distance is considerable, is to pack them in boxes or kerosene tins with dry charcoal. Rubber seeds do not keep well, and if their destination, packed in this way, covers a period exceeding one month, 40 per cent. may not sprout; if two months, experiments have shown that 70 per cent. may be useless. The other method, which is more expensive, is to forward them in a wardian case. This is a box in size about 2 feet by 4 feet, and 2½ feet in height, containing eight trays, each tray holding 15 inches of soil and 200 seeds.

In preparing a nursery for these seeds, good, rich, friable, well-drained soil, having an elevation from 10 to 300 feet above the sea level, should be chosen, all vegetation should be cleared off, and the ground dug up to a depth of 2 feet. The seeds should be steeped in water for two hours before planting, and placed in the ground 6 inches apart. They should be laid horizontally and not perpendicularly, the flat side downwards, and should be just covered with earth, which must be kept moist. They should sprout in about 48 hours. If the weather is hot the young sprouts should be protected by a little shading, such as small sticks and leaves; a covering of leaves is also a good thing if rats or mice are troublesome. If there are wild pigs in the neighbourhood a pig-proof fence is necessary.

In clearing the jungle for the plantation the workmen are armed with scrub-cutters and light American axes. The large trees are felled, and the scrub and tree tops burned when the weather is favorable. The tree trunks and stumps are left on the ground to rot, the process of decay being often assisted by white ants. The planting often closely follows up the clearing to save time. The young trees should be transferred from the nursery to the plantation when they are from 18 inches to 2 or 3 feet in height. A difference of opinion exists as to the number of trees that should be planted to the acre. The best expert opinion seems to favour the trees in each row being 20 feet apart, with an avenue of 25 feet between each row. The trees should be 18 inches high in 4 or 5 months, and 5 to 6 feet in 12 months. If they shoot up too quickly, and become too lanky that the wind blows them about, the top shoots should be pinched off with the aid of a step ladder.

The trees should not be tapped until they are six years old. By that time they should be at least 4 inches in diameter, probably more if the conditions are favorable. The best method for tapping para rubber trees is what is known as the "herring-bone" system. A perpendicular scarf 6 or 8 feet in length is cut out of the bark to a depth almost sufficient to reach the wood. Alternately from each side of this central incision other latex gutters are cut in an upward direction, forming an angle with the perpendicular incision of 45 degrees. The lateral incisions are from 18 inches to 2 feet apart, and reach half way round the stem. An aluminium cup is placed at the foot of the tree to catch the latex as it gradually trickles down. In this cup is placed as much water as would fill two tablespoons, and in this a little formalin is mixed to prevent the latex from coagulating. When the cups are full they are emptied into an enamelled jug and taken to the drying-house. The latex is
then poured through a fine mesh strainer into enameled dinner plates, so as to form a thin layer, and a little acetic acid is stirred in to assist the solidifying process. When hard the "biscuit," as it is called, is taken from the plate and hung up in the drying-room, before being packed in boxes for export. In no case should any artificial heat be employed, as it destroys the resilience of the rubber. The quantity and quality of the latex is believed to improve as the tree grows older, up to the twenty-fifth year. For this reason the latex taken from trees of different ages should not be mixed together; the quality is thus graded, according to the age of the tree. The tapping process continues for a month or even several months. Each morning the lateral incisions are slightly enlarged by cutting a very thin strip of bark off the lower side. This causes the latex to recommence running. But sufficient time should be given for the wound to heal up before the succeeding year's tapping commences. When the young trees are growing, the planter should see that the stems grow as perpendicularly as possible, as a straight stem facilitates tapping operations.

An improved yield can often be obtained by careful selection. Trees can be propagated by seed or cuttings, and if a specially vigorous or large latex-producing tree is discovered, it is advisable to propagate by cuttings, as they are more likely to carry the special characteristics of the parent tree.

In the Federated Malay States a large number of rubber trees have been planted between the bushes of coffee estates, the yield of coffee often paying the expenses of the estate until the bushes are destroyed by the growth of the trees. In order to gain some revenue while the rubber trees are young, it is not considered injurious to the trees to plant a catch crop (i.e., a crop from which a quick return is obtained) between the trees, such as Liberian coffee, which will come into bearing in two years, bananas, maize, ground nuts, yams, sweet potatoes and other annuals. When the rubber trees have attained considerable dimensions they usually destroy other vegetation in the plantation. Although the para rubber trees are vigorous and hardy they are not immune from pests and diseases. A species of white ant (Termes gestroi) is the most dangerous pest, as it lives on green wood and will readily eat the rubber roots. I am not aware if the "gestroi" species of white ant is to be found in Papua. While white ants are very numerous there I have not heard of any trees being killed by them.

Another danger to be avoided is a root fungus known as Fomes semitostus. Apparently this fungus can only be communicated from tree to tree by the roots interlacing. I have seen trees killed by this disease in the Botanical Gardens at Singapore. In order to prevent its spreading a deep trench has been dug between the stricken and sound trees, and Bordeaux mixture is being used to kill the fungus. With the object of guarding against the possible spread of plant diseases and pests a strip of jungle, a mile wide, running across the State of Selangor has been proclaimed a forest reserve, and by this means a disease in one section may be prevented from spreading to another.

The only other kind of rubber that has been successfully cultivated in the Malay States is the native "Rambong" (Ficus Elastica). This grows and yields well, and its product if carefully prepared is nearly equal in value to para. This class of rubber should also be cultivated in Papua. In tapping the Ficus Elastica the "herring-bone" system is not recommended by the Dutch authorities, who prefer the method of cutting the trunk in a number of different places.

There has been a good deal of discussion as to the relative value of forest and estate rubber. At the present time the best cultivated para rubber from the Malay States fetches about 6 Sullivan, a pound more than forest rubber from Brazil. It is, however, stated that the small amount of estate rubber put on the market is bought up for making rubber solution, because it saves the expense of cleaning the forest rubber, and it is further stated that for the manufacture of sheet goods—which constitutes nine-tenths of the rubber trade—the forest rubber is preferred. The latex taken from para rubber trees is believed to improve in quality each year until they are 25 years old. The estate rubber is at present principally taken from young trees, which probably accounts for the preference given to rubber from the para forests for general manufacture.
The following is an estimate of the cost of clearing and planting 250 acres with para rubber trees in Papua: —

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Felling and clearing 250 acres at 30s. an acre</td>
<td>£375 0 0</td>
</tr>
<tr>
<td>Lining 250 acres at 5s. an acre</td>
<td>62 10 0</td>
</tr>
<tr>
<td>Holing and filling 250 acres at 12s. an acre</td>
<td>150 0 0</td>
</tr>
<tr>
<td>Nurseries</td>
<td>30 0 0</td>
</tr>
<tr>
<td>Seed for same, planting 20ft. x 25ft. — 86 per acre = 21,500 seeds, say 25,000 at 5s. 10d. per thousand</td>
<td>7 5 10</td>
</tr>
<tr>
<td>Planting and shading at 7s. 6d. per acre</td>
<td>32 15 0</td>
</tr>
<tr>
<td>Roads and drains</td>
<td>100 0 0</td>
</tr>
<tr>
<td>Weeding and maintenance for 12 months</td>
<td>200 0 0</td>
</tr>
<tr>
<td>Supervision</td>
<td>300 0 0</td>
</tr>
<tr>
<td>Rent of land, say 6d. per acre</td>
<td>6 5 0</td>
</tr>
<tr>
<td>Recruiting, say 30 natives, and expenses in connexion therewith</td>
<td>150 0 0</td>
</tr>
<tr>
<td>Survey fees, say</td>
<td>10 0 0</td>
</tr>
<tr>
<td>House for superintendent</td>
<td>250 0 0</td>
</tr>
<tr>
<td>Huts for natives</td>
<td>200 0 0</td>
</tr>
<tr>
<td>Tools</td>
<td>50 0 0</td>
</tr>
<tr>
<td>Contingencies, sickness, &amp;c.</td>
<td>150 0 0</td>
</tr>
</tbody>
</table>

Total cost: £2,134 15 10

Upkeep for five years, including recruiting of labour, at £700 a year: £3,500 0 0
Rent for five years: 31 5 0

Total upkeep and rent: £5,666 0 10

At the end of six years, assuming that the trees each yielded 2 lbs. of rubber at the present price the gross income would be £12,900, or over 220 per cent. on the outlay. With rubber at 2s. a lb. the gross income would be over 75 per cent. In order to double the area of the plantation, the cost would be only £1,714 as items of expenditure Nos. 9, 11, 13, 14, and 15 would be obviated. Under skilful management catch crops planted between the trees should produce sufficient revenue to defray the cost of upkeep, reducing the capital outlay on a rubber plantation of 500 acres, in full bearing, to £3,500.

As soon as a planter has obtained his land, he should order his rubber seed and food supplies, and engage half-a-dozen natives to put up his dwelling house, which can be constructed entirely of native material — as are most of the residences of the divi-ional magistrates — and the huts of the native employes. The next work should be to clear a couple of acres of the proposed plantation, and with the exception of the small area required for the nursery the balance should be planted with yams and sweet potatoes. This is the method adopted in the Solomon Islands (a British Protectorate) and in the German Possessions in the Pacific. This largely obviates the expense of native labour (i.e., imported food supplies), and the health of the natives is better when they are supplied with their accustomed food than when placed on a pure rice diet, although they should be supplied with rice occasionally. As soon as this is completed the planter is ready for the main body of plantation workers, and they can start scrub clearing as soon as they arrive. In five months from the planting of the seed the young rubber trees can be transferred from the nursery to the plantation.

COCONUTS.

The extension of coconut plantation in the Federated Malay States is progressing slowly on account of the greater attractiveness of rubber cultivation. It is a very remunerative industry and one that should receive quite as much attention in Papua as rubber culture, as the natural conditions there are eminently suitable, and skilled labour or extensive plant is not required in the production of copra. In fact it is the only plantation industry of which the Papuans have any practical knowledge. Papua, being outside the hurricane belt, possesses a great advantage over such places as Fiji and Samoa.
The area under coconuts in the States is estimated at 86,000 acres, the plantations lying chiefly along the West coast, as the trees yield best when they can taste the sea. In 1904, 976 tons of copra were exported—an exceedingly small return for the area planted. This is to be accounted for by the fact that the trees in the great majority of the plantations are just coming into bearing. With the present area in full bearing the export of copra should be something like 43,000 tons, or half a ton to the acre, as the yield of the trees in the peninsula is heavy.

In coconut planting no nursery for the young plants is necessary, as the coconuts lying on the ground under the trees or in heaps will throw out sprouts.

The coconut plantations I saw in the States appear to me to be planted too closely together, in some cases, I believe, as many as 200 to the acre. In the Solomon Islands they are always planted 35 feet apart, or 50 to the acre, and in the German plantations, in the Bismarck Archipelago, they are planted from 25 to 50 feet apart. This method of allowing each tree more ground space tends to make them shorter, bulkier, and more vigorous, with a consequent larger yield of nuts, while the larger amount of sunlight they receive keeps them more free from insect pests and disease. The trees begin to yield in five years, and are in full bearing when eight or nine years old. A full grown tree should yield 60 nuts a year, and with 50 planted to the acre that area will yield 3,000 nuts, or half a ton of copra worth £5.

An idea of the value of a coconut plantation in the Malay States can be gained by the report issued by the Inspector of Coconut Trees, in which he records the sale of a plantation of trees just coming into bearing at £30 per acre.

A factor of great importance in connexion with the copra industry is the absence of large fluctuations in the price of the product, and the remote probability of there being a serious slump in prices, as the demand for the oil is almost unlimited. One of its principal uses is for soap manufacture, and as the price of coconut oil is very little more than that of the best tallow, the demand is not at all likely to fall off.

In the German possessions and the Solomon Islands, the coconuts are allowed to fall naturally to the ground before being collected and taken to the copra sheds. In the Federated Malay States they are plucked off the tree as soon as ripe. While this must be included in the category of "manual" labour it entails little human effort, as the work is performed by trained monkeys under personal guidance. A native possessing one or more pig-tailed baboons (locally known as a "broth") enters into a contract to pull down the ripe coconuts from the trees. His monkey, with a long string attached to its body, ascends the tree and proceeds to twist a nut off; if the fruit is too green to pluck, a tug at the string causes it to relinquish that nut and tackle another; in this way only the matured nuts are gathered. The coconuts are split open and left in the sun until the flesh or copra begins to curl. It is then taken out, chopped up, and spread on the trays to dry, preparatory to its being bagged for export.

Coconut trees in the Peninsula have suffered considerably from the attacks of the coconut beetle, and this evil assumed such proportions, owing to the carelessness of the native cultivators, that the whole industry was jeopardized. To cope with this danger "The Coconut Trees Preservation Enactment" was passed, and an inspector appointed. Plantations were regularly inspected, the rubbish which had been a breeding ground for the beetles was collected and burnt, diseased trees were destroyed, and plant sanitation rigorously enforced. The Act endowed the inspector with powers to enforce his decisions; if the cultivator refused to obey instructions, the work was done at his expense, and the owner punished. This wise and firm treatment has rehabilitated the industry and placed it on a sound basis.

It would, I think, be advisable, when the Legislative Council of Papua is passing an enactment dealing with agriculture generally, to include certain clauses, empowering the administration to insist on plantations being kept in a cleanly state, and authorizing the authorities to destroy, without compensation, any diseased trees that were endangering the industry.
The following is an estimate of the cost of cleaning and planting 500 acres with coconut trees in Papua:

<table>
<thead>
<tr>
<th>Item</th>
<th>£</th>
<th>s</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Felling and clearing at 30s. per acre</td>
<td>750</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lining and hoisting</td>
<td>40</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cost of 25,000 coconuts for planting</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Planting coconuts, 33 feet × 33 feet</td>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Weeding and maintenance</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Roads</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>House for superintendent</td>
<td>200</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Huts for natives</td>
<td>200</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tools</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Supervision</td>
<td>250</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Rent (say 6d. an acre)</td>
<td>12</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Recreating 30 natives (labourers)</td>
<td>150</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Contingencies</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

| Upkeep for five years at £4.15 a year     | 2,250 | 0   | 0   |
| Rent for five years                       | 42    | 10  | 0   |

**Total:** 4,255

In the sixth year the trees should bear 40 nuts each, or 167 tons of copra, worth £1,670. In the eighth year the trees should bear 60 nuts each, or 250 tons, worth £2,500. This would represent a gross annual profit on the total outlay of about 50 per cent. Healthy trees will live at least 60 years, probably longer. The cost of upkeep could be defrayed by the returns from catch crops, reducing the capital outlay to £2,000.

**Sugar.**

The sugar fields cover an area of 18,000 acres, and are situated on the rich alluvial coast soils of the State of Perak. Besides the local consumption, 20,167 tons were exported in 1904. The cultivation is mostly in the hands of Chinese, although there are two or three large estates owned by Europeans. It is quite possible that the sugar industry will attain large dimensions in the Federated Malay States, and competent authorities believe that it will become one of the most important industries. Like kindred industries, its expansion is governed by the world’s prices, and not by the extent of good available land. Last year the price of sugar was fairly high, and good profits were made, but this year lower prices rule, and the lessened returns may discourage vigorous development.

In Java the sugar industry has assumed much greater proportions, and is conducted on the most modern methods, with the most up-to-date appliances. I have therefore dealt with the subject more fully in that portion of my report.

In any case this is one of those industries that we can hardly hope to see introduced into Papua for some years, as successful sugar production requires an initial outlay of from £50,000 to £60,000 in plant alone if success is to be hoped for.

**Rice.**

Rice is practically the only crop that is largely cultivated by the Malays. They practically monopolise the industry, although a considerable area in the Krian district is cultivated by immigrant races; but it is a peasant and not an estate culture, each family rarely growing more than sufficient for its own consumption. The total area under rice is 112,000 acres, or nearly one-third of the whole cultivated area of the Federated Malay States. The local consumption of rice is enormous in the aggregate, as it forms the staple food of more than three-fourths of the population. Roughly speaking, each adult male Malay consumes about 600 lbs. of rice per annum, and an average Malay family 2,500 lbs. The natives plant only one crop of rice in the year, although two could be produced annually on the same plot of land. This system may not be wholly the result of indolence on the part of the Malay. The ground is improved by a rest, and the weeds and growth that make their appearance are turned in as green manure. Two principal types of rice crops are grown—hill or dry.
paddy, and wet or irrigated paddy. The former method of cultivation is now prohibited, except in the case of the Sakais (mountain races, some 17,000 in number, who are believed to be the aboriginal inhabitants). The object of this embargo is to prevent forest destruction, as fresh jungle is cleared for each succeeding crop; because dry rice cannot be grown profitably year after year on the same land. The method of rice culture is very primitive, necessitating an immense amount of labour to attain a given result, while the yield might be increased by better methods of cultivation and a careful selection of seed. The Government have made praiseworthy efforts to benefit the Malay in this respect, and to increase the annual production. One hundred square miles of the Krian district have been irrigated at a cost of £160,000, a very small sum considering the area supplied with water. The ground is low-lying and flat, and therefore lends itself to economic irrigation, while the water supply is abundant and accessible. Two thousand acres of this have been taken up by Tamils for rice cultivation, and additional areas by other races, while a considerable area has been used for sugar-growing.

The Government is also experimenting with the object of securing an improvement of the grain by hybridisation and the introduction of new varieties.

In spite of these efforts the area under rice cultivation does not indicate much expansion, and there is little likelihood of the local supply overtaking the demand. The annual import of rice is, roughly, 100,000 tons, and the export 11,000 tons. It would, I think, be unadvisable to encourage the cultivation of rice for the present at any rate, in Papua. In the first place, it postulates extensive irrigation, and in the second place it is a crop that requires a larger amount of labour and attention than almost any other crop value for value. A similar amount of labour on rich, unirrigated land would produce a larger food supply of tapioca or sweet potatoes.

Coffee.

Although this crop receives little attention now, it was formerly the chief plantation industry of the country. But the enormous production of Brazil and other places so glutted the market that prices became remunerative. Many of the older coffee plantations have been abandoned and overgrown with lalang grass; while the more recent plantations have been largely planted with rubber. The trees are planted amongst the coffee bushes. The rubber trees, if planted a good distance apart, do not destroy the coffee plants until they have assumed considerable dimensions, and in the meantime the profits from the sale of coffee contribute materially towards the cost of maintaining the rubber trees.

Conversely Liberian coffee is an excellent catch crop to plant between the trees of a rubber plantation, as the bushes come into bearing in two years.

In this way coffee-growing may be profitably carried on in Papua, and constitute an important element in the general industrial development. Already three small coffee plantations are in existence there, but it is questionable if they will pay at present prices unless as a catch crop.

With a view of assisting coffee planters to tide over the period of low prices, the Government of the Federated Malay States has abolished the whole export duty on coffee when the price is less than 19 dollars a pikul (about 4d. a lb.).

It has generally been held that all varieties of coffee grow best at a considerable altitude, and that they require to be protected by shade trees from the full heat of the sun. In the Federated Malay States, however, the Liberian coffee bushes have been planted on rich alluvial land only a few feet above the sea-level, and unprotected by any shade trees. The bushes are large and healthy, and bear a splendid crop of berries. So far as productiveness is concerned they will compare with similar plantations in other countries. Whether the quality is up to the highest standard I am unable to say. The prices are a little lower than in other countries, but it is probable that this is assignable to the method of preparation rather than to the quality of the raw product. The area at present under coffee culture is 19,000 acres, but a very large proportion of this land has been also planted with rubber, and in some cases coconuts, and the industry is likely to dwindle unless coffee is replanted as a catch crop between the young rubber plantations. In 1904, 3,400 tons of coffee were exported.

Mr. W. W. Bailey, at Klang, has carried out some interesting and valuable experiments in the hybridisation of coffee. One variety that he has produced, called "Bailey's Hybrid," is a cross between Stenophylla and Liberian, and is believed to be one of the best kinds known.
The following is an estimate of the cost of clearing and planting 100 acres with coffee in Lapua:

1. Nursery expenses (growing 44,000 plants 6 inches by 6 inches — allowing a margin of 20 per cent. for failures — including seed, shade for young plants, &c.) £ 0 0 0
2. Felling and clearing at 30s. per acre £ 0 0 0
3. 36,000 pegs for lining £ 0 0 0
4. Lining £ 0 0 0
5. Hoisting 36,000 holes, 12 feet by 10 feet £ 50 0 0
6. Planting, filling holes with surface earth, and shading £ 120 0 0
7. Weeding and maintenance for part of year £ 30 0 0
8. Roads £ 20 0 0
9. Tools for clearing and planting £ 30 0 0
10. House for superintendent £ 200 0 0
11. Huts for natives £ 150 0 0
12. Supervision £ 250 0 0
13. Rent of land, say 6d. an acre £ 2 10 0
14. Survey fees £ 5 0 0
15. Recruiting native labourers £ 100 0 0
16. Various expenses and contingencies £ 50 0 0

£1,227 10 0

When the trees are bearing, extra buildings are required, and provision for the preparation of the coffee, costing, say, £60.

If the 100 acres of coffee were planted as a catch crop between rubber trees, the expenditure on items 2, 7, 8, 9, 10, 11, 12, 13, and 14 would be unnecessary, and the expense of planting the 100 acres would be reduced from £1,227 10s. to £390, as the £50 for contingencies would be sufficient to provide for the small amount of extra labour in maintenance, beyond the ordinary work of a rubber plantation. Liberian coffee grows best below 2,100 feet, and is the harder plant. Arabian coffee requires an elevation of 2,000 to 4,500 feet, and is worth from 20 to 30 per cent. more than Liberian, while in good ground it will yield equally as well. The Arabian variety was largely destroyed in Java by the leaf disease.

TAPIoca.

The cultivation of tapioca (called in other countries cassava or manioc) is an industry of considerable importance and value in the Malay States, the crops, principally in the hands of Chinese, covering an area of 17,000 acres. In 1904 the exports totalled 8,200 tons, worth, it is estimated, £90,000, while the local consumption is considerable. The yield of tubers is very large, and the crop is consequently a most exhausting one for the soil. The land is able to produce only three successive crops, and is useless for tapioca for a long time afterwards. Owing to the greedy nature of the plant, and the method of production in the earlier days of the Protectorate, considerable injury has been done to large areas of the most fertile land in the Malay States. The method in the past was to clear a piece of forest land, take off two or three crops, and then abandon it. Abandoned cultivations in the Malay States are soon covered with a waving growth of "laling" grass (Imperata arundinacea), one of the most troublesome weeds in the Peninsula. Its shoots creep underground and throw out roots as they go along, while the fluffy seeds are carried everywhere by the wind. Once the laling gets hold of an abandoned holding the ground is practically useless, as cattle will not eat the grass, and it would take from £1 to £3 an acre to chop it out. Fortunately, it will not grow well in shade, and, consequently, the jungle is fairly free from its presence. Thousands of acres of useless laling country mark the districts where tapioca and, to a less extent, coffee were previously cultivated. New regulations have lately been enforced under which a cultivator, taking up land for tapioca, is obliged to plant with it fruit trees, coconuts, rubber, or some other permanent culture; by this means abandonment of the area is prevented, and other useful industries are stimulated. The large growers make the tapioca of commerce from the tubers, while the natives cook and eat them like yams or sweet potatoes. They are also largely used in some countries for the manufacture of starch.
and as food for fattening cattle. The cultivation of tapioca is an industry very suitable for Papua, and its introduction should be encouraged, but under the strictest regulations regarding tree-planting, or otherwise making it permissive only as a rotation crop.

When Dr. Willis, the Director of the Royal Botanical Gardens in Ceylon, visited the Federated Malay States to report on the industries, he stated: “So far as the particular case of the Malay States is concerned, it seems doubtful if any important industry other than coffee, sugar, rice, coconuts, tapioca, and rubber is likely to be discovered for some time.” These industries I have now described, and have advocated the cultivation of the three last-mentioned in Papua, and coffee as a catch crop only, unless there is an improvement in the market price. There are other industries suitable for Papua, which cannot be profitably cultivated in the Malay States owing to the fact that there is little country suitable for agriculture at a considerable elevation. These will be fully dealt with in Chapter X. on Java.

This inquiry into the economic development of the Malay States would not be complete without a short description of other economic plants, that are either being experimented with in the Government Gardens, or are being cultivated on a small commercial scale.

Pepper.

The cultivation of pepper is principally centred in the State of Negri Sembilan. At present 3,500 acres are under cultivation—a much smaller area than in former days. The decline is caused by over production in other lands and the consequent low prices. The amount of pepper exported in 1904 was 547 tons.

Pepper is planted from cuttings taken from the young vines. Great care should be exercised to insure their being taken from healthy stocks, and difficulty is sometimes experienced in getting the cuttings to root. Hardwood posts 11 feet long are placed in the ground 2 feet apart; the portion put in the ground (about 2 feet) must be tarred to resist white ants. In Java I have seen the pepper vines trained up kapoc trees, which is a more effective and cheaper method. The vines in the Malay States are trained up these posts, and should not be allowed to bear until they have reached the top—usually in about three years. A good pepper plantation should yield half a ton of pepper to the acre in, say, four years from the time of planting. The cost of curing the pepper is small, no expensive machinery or buildings being necessary. By using kapoc trees instead of hardwood posts the cost of planting an acre should not exceed £12, while the kapoc trees are an additional source of revenue. The soil and climate of Papua are well suited for pepper culture, and as the market for pepper has improved lately, I think it should be tried on a small scale. The difference between black and white pepper is only in the preparation.

Gambier.

The leaves of the gambier shrub are largely used in tanning and dyeing; 22,000 acres are at present under cultivation, and 1,550 tons were exported in 1904. As a dye it is principally used for native cloth, aniline dyes having largely superseded all vegetable products. As a tanning agent it is inferior to oakbark or sumac. Its cultivation in Papua would not be warranted, as it is not a profitable export industry.

Gutta Percha.

There are several varieties of gutta percha, of which the “Palauan gutta” is the best. It is indigenous to Malaya, although now cultivated in many places. It is indispensable for long distance telegraphy, as it possesses the property of perfect insulation. It is also used for surgical instruments. The principal supplies have been obtained from the forests of Malaya, and most of the large trees have been destroyed by the Dyaks and others in the process, as the latex cannot be obtained by tapping, and the trees have been cut down. A number of young trees have been discovered in the forests of Perak, and these are being carefully protected by the Forest Department. The proper method of obtaining the gutta percha is to prune the trees, grind up the leaves and stalks with a pulverizer, and throw into water; the gutta percha will gradually rise and float on the top, when it is skimmed off.

The demand for gutta percha is very intermittent. Sometimes prices are very high, especially when cable construction is active. At other times there is little demand. Owing to the strides wireless telegraphy is making the demand may become still less. During 1904, 105 tons were exported from the Malay
States. The yield per tree is not nearly so large as in the case of rubber, and it is a particularly slow-growing tree, no gutta percha being obtained until it is 25 years old, and sometimes 50. For private enterprise gutta percha-growing is out of the question, but a Government plantation is advisable. In Java a large area has been planted by the Government, and this should be done in Papua, as the trees could be planted in a forest reserve by simply clearing a space for the young trees.

**Indigo.**

Indigo growing was a very important industry before the discovery of aniline dyes. It is grown by the Chinese, generally as a catch crop, on coconut and rubber plantations. The total export in 1901 was 407 tons. It is principally used for dyeing the blue cloth worn by Chinese coolies and others.

**Nutmegs.**

There is a little haphazard cultivation of this product, but the return is uncertain. Only about half the trees bear, as it is impossible to tell which are the male trees until nearly bearing time. A return may be looked for when the trees are six years old. I have seen these trees growing and bearing well in the Bismarck Archipelago, and I think a few should be planted on good well-drained soil in experimental gardens in Papua. They should be planted 30 feet apart. Between the outer covering and the nutmeg there is a second covering: this is the mace of commerce.

**Kola Nuts.**

The Kola tree (*Cola acuminata*) is a heavy bearer, producing a pod which contains several seeds about the size of horse chestnuts, from which a valuable drug is made. The seeds are bagged and exported. The Curator of the Botanical Gardens at Singapore thinks it should be tried in Papua.

**Sago.**

The sago palm is grown in many places in the Malay States. The trees prefer rich, swampy land. It is a valuable food product, and the cultivation is simple. Sago is indigenous to Papua, and on hundreds of square miles of low lying and swampy country this valuable food-tree is growing. Its cultivation, therefore, is not necessary, but a strong effort should be made to utilize this natural wealth.

**Camphor.**

*Formosa* camphor (*Camphora officinarum*) grows best at a considerable altitude. For a long time the supply has not nearly equaled the demand, and prices during the last five years have gone up 170 per cent. Its principal use is as an ingredient in smokeless powder (cordite), and it has been largely used in the manufacture of celluloid, moth balls, &c. On account of the insufficient production another ingredient has had to be used as a substitute for camphor in the production of celluloid; and naphtha balls have been utilized as an inferior substitute for camphor as an insect destroyer. It, however, remains an indispensable constituent of cordite, and as the material is likely to be in large demand until we reach the millennium, a good market for some time is assured. The principal supplies have come from Formosa, but these have fallen off considerably since the territory came into the possession of the Japanese. In manufacture the tree is cut down, the wood and boughs chopped up, and the camphor obtained by distillation. This should certainly be tried in Papua in the Government experimental garden.

**Cotton.**

For the growth of cotton the climate is unsuitable, as it requires some months of dry weather while the bolls are developing. It has been tried experimentally in the Botanical Gardens in Singapore, and Mr. Ridley informs me that seven or eight different kinds of bugs attack it on sight.

It is, I believe, quite unsuited for Papua. A careful record of the daily rainfall in Papua, East of the Owen Stanley Range, was sent to the British Cotton Growers' Association by Mr. Rochfort, and the Secretary reported that the rainfall was too continuous for the commercial cultivation of cotton. In New Britain, in the Bismarck Archipelago, I have seen a large number of dead cotton bushes in a plantation, the loss being caused either by insects or disease.
Kapoc.

Kapoc grows well in the Malay States, and there is a small industry in Kapoc fibre, but it barely pays to grow as a special crop. It grows with remarkable rapidity, and the growing trees are used in German New Guinea as green posts for wire fencing; thus getting over the difficulty of white ants; and in Papua it should be introduced for that purpose, and instead of posts for training pepper and other climbing economic plants.

The Kapoc fibre can also be used as a subsidiary product. In some portions of Netherlands India, growing Kapoc trees are used for telegraph poles.

Tea.

The cultivation of Tea has never been attempted on a commercial basis in the Malay States, although small experiments in many estates have been tried, and it has been cultivated successfully in the Hill Gardens of Perak; but the country is not well suited for the product, as there is not a sufficiently large area of good elevated ground. It would also be useless to attempt competition with old established centres, as the present low prices only allow a small margin for profit, and an immense amount of cheap labour is required in the picking season. While the natural conditions in Papua should be suitable for tea culture, the small profits, the large amount of skilled labour, and scientific management required, the growing competition and the established reputation of other centres would almost inevitably lead to unsuccessful results. The varieties most usually grown are the Assam Hybrid and the China tea bushes. The former is the kind principally grown, except in China.

Maize.

Only small quantities of maize are grown in the Malay States; the quality is inferior and the yield poor. This should only be grown in Papua as a catch crop between the rubber and coconut trees.

Fibres.

There is an immense number of fibrous plants that grow well in the tropics, many of them yielding most valuable fibres; but the amount of labour required to extract this and prepare it for the market makes the cultivation generally unprofitable. In the Singapore Botanical Gardens alone there are no less than 35 species and varieties growing well, and yet as a commercial industry fibre plants are not cultivated in the Malay States, in spite of the enormous demand for such commodities in the markets of the world.

Ramie.

Various varieties of ramie are amongst the finest and most valuable fibres in the world. The plant is about four feet high and grows well in the States, yet in spite of these advantages, the considerable areas that have been cultivated by various planters have all ended in absolute failure. This was owing to the expense in preparing the crop. The fibre is obtained from the bark, which has to be stripped off the small limbs of the plant and then prepared by a laborious process.

Murva.

Murva, or bow-string hemp, is another very valuable fibre. There are several varieties, of which Susevieria zeylanica is the best. It should be grown in slight shade, and could be used as a catch crop.

Sisal hemp does not grow well near the equator as it requires a dry climate. It grows best 20 degrees from the equator, or just inside the tropics. This is an industry that might be cultivated with success in certain parts of Australia. At Bigo, in Papua, there is a small plantation of sisal hemp. While it may be hoped this will result in success, the probabilities are against it, as in the opinion of the most competent experts, the climate is altogether unsuitable. Dr. Treub, Director of
Agriculture in Java; Mr. Ridley, Director of the Singapore Botanical Gardens; and Mr. Carruthers, Director of Agriculture for the Malay States, were all of opinion that the climate of Papua is unfitted for its culture. This is probably another illustration of the necessity of expert knowledge in starting new industries.

**Manilla Hemp.**

Manilla hemp (*Musa textils*) is not, strictly speaking, a hemp at all; it belongs to the banana family, and is one of the finest fibres for rope making. It is largely produced in the Philippine Islands, the 1894 crop being valued at £4,359,000, or very nearly 60 per cent. of their total exports. It requires a rich soil with plenty of humus, a regular rainfall, and shelter from strong winds. In Manilla, on good soil, the plantations are renewed only after a period of fifteen or twenty years. When the plant begins to bloom the leaf sheaths are pulled off, cut into lengths—the longer the better—and are drawn under a heavy knife. The knife is fixed to a table or board, like a large tobacco-chopper, and the leaf sheath is dragged through. This is repeated until all the pulpy part is separated from the fibre; which is then washed, dried, and packed. Good Manilla hemp is worth from £56 to £48 a ton. Seeds can be sent in a Wardian case. The most difficult problem in all fibres, except cotton, is the trouble and expense in extraction and preparation.

An improved Mexican raspador (rasper) has been invented in the United States which will, it is believed, largely solve the problem of this labour and expense. If that be so, the most valuable fibres amenable to this treatment should be grown in Papua. I would recommend that small patches of ramie, murua, and Manilla hemp should be laid down in the Government Experimental Gardens.

**Drugs.**

There are a large number of tropical plants yielding drugs, some of which are valuable for local consumption and others for export. I append a few particulars of some useful kinds that are easily grown and require no skilled labour in their production.

**Bael Fruit.**

Bael fruit grows easily from seed and bears a fruit something like an orange in its appearance. It is an excellent cure for dysentery, a disease very rife in the tropics, both amongst white people and natives. The medical properties are contained both in the fruit and seeds, which are eaten. They have been planted at all the police stations in the State of Malacca, for the use of the native officers.

**Kosam.**

Kosam (*Brucea Samatrana*.)—The seeds from this shrub which is a quick grower are very bitter, and have been found very valuable in cases of dysentery and persistent diarrhoea. The sufferer is given twelve seeds to chew the first day, and a lesser number afterwards. Some notable cures have been effected by them.

**Coca.**

The coca shrub grows from 6 to 8 feet high and is easily cultivated. From the leaves is extracted the valuable anaesthetic known as cocaine, used in dentistry and surgical operations. The leaves can be picked two years after planting. They are then dried and exported. The market is very variable, and occasionally a good price is obtained.

**Castor Oil.**

The castor oil shrub (*Ricinus Communis*) is easily and quickly grown. The seeds from which the medical oil is extracted are collected and exported. In the Singapore Botanical Gardens the caterpillars have destroyed a number of the trees.

**Cassia Alata.**

The leaves of the cassia alata shrub, used as a poultice, are good for some skin diseases. A few seeds are scattered in the ground, and this is all the cultivation required. Skin disease amongst the Papuans is very prevalent.
Sarsaparilla.

The sarsaparilla bush (Smilax aspera) is an annual. It should be planted in rich soil. The roots are dried and exported, or boiled, and the liquid used as a local medicine.

Ginger.

Ginger (zingiber officinale) is easily grown. The roots, from which the ginger of commerce is extracted, are dried and exported. It is a plant that soon exhausts the soil.

Chinese ginger (zingiber Sp). Some plants of this species produce the well-known preserved ginger of commerce.

Bamboos.

The gigantic bamboo-reed or grass is most useful in a variety of ways, and is considered almost indispensably in the East. Its uses range from house-building and fencing material to natural water pipes, while the tender shoots form the principal ingredient in a bamboo-curry. About twelve varieties are cultivated in the Malay States, and some of these should be grown in Papua, as they require no attention after planting.

PART II.

JAVA.

THE SYSTEM OF GOVERNMENT, METHODS OF ADMINISTRATION, AND ECONOMIC DEVELOPMENT.

CHAPTER VI.

SYSTEM OF GOVERNMENT AND METHODS OF LEGISLATION.


Area and Population.

Java is the second in that garland of islands that stretch from the Malay Peninsula to New Guinea. It has an area of 50,000 square miles, about one-half the size of Papua, or the State of Victoria; and constitutes but one-fourteenth of the Dutch Island Empire in the Malay Archipelago. The population of Java and the small Island of Madura, at the census taken in 1900 was 28,747,028, and at the present time must be over 30 millions, or 600 people to the square mile. Of these not more than one million and a half are concentrated in large towns. The most surprising characteristic of the Javanese natives is their extraordinary fecundity, the population having increased during the last hundred years from four millions to its present enormous dimensions, and this without any immigration worth mentioning. No higher tribute can be accorded to Dutch rule in Java than the simple fact that the inhabitants have increased seven fold within a century, an unprecedented record that is in pleasant contrast with the usual annals of tropical colonization. The Javanese belong to the Malay stock, which is believed to have spread in prehistoric times from South-eastern Asia over the islands of the Malay Archipelago almost as far as New Guinea. In spite of this common descent, the natives differ somewhat in physique, temperament and characteristics. The Soeundanese of Western Java are more sedentary, and show a greater personal independence than the more restless Javanese proper, who inhabit the central portion of the island. In the
first century of our era, Java was invaded from Continental India, and for nearly 1,500 years the island was governed by Hindoo Dynasties. In 1478, A.D., the island was captured by the Arabs, and the natives were gradually converted from Buddhism to the Islamic faith. While it is difficult to estimate the influence that the Hindoos exercised over their Malay subjects, the infusion of Hindoo blood seems to be more evident in Central Java than elsewhere. This was probably the Hindoo stronghold, as the magnificent ruins of ancient Buddhist temples scattered everywhere about seem to testify.

In the island of Madura, and the eastern portion of Java, the inhabitants are more enterprising, and are possessed of greater courage and truculence—they prefer to fight in the open rather than under cover, or by stabbing from behind, as is the more usual method in Central Java.

The ethnological divergencies in Java are, however, not nearly so accentuated as in Papua, where the present inhabitants seem to have sprung from at least two if not three separate stocks.

The immigrant races in Java are surprisingly few in number. The most important, numerically, are the Chinese who number 277,265, or less than one per cent; while the governing race—the white inhabitants—master only 61,730. Of these about one-half are employed in civil and military occupations, one-third in agriculture, and one-sixth in trades and professions. A few Arabs and a lesser number of Japanese practically complete the total.

**System of Government.**

**Central Organisation.**

At the head of the Government of Netherlands-India is the Governor-General. He is assisted by, and presides over, the Indian Council, consisting of five members— a Vice-President and four others—appointed by the Sovereign. The functions of this body are chiefly of an advisory nature. It possesses some legislative power, but no executive functions, and the Governor-General is not obliged to accept its advice except in a few matters. The councillors are men of high standing and ability, and their deliberations are of importance in the government of the Indonesian possessions.

The Chief Secretary is the head of the Secretariat, or Cabinet of Secretaries to the Governor-General.

The Central Administration of Java is conducted by eight Chiefs of Departments, of whom six are called "Directors," each controlling one of the following Departments:

1. Justice.
2. Finance.
3. Internal Administration.
5. Public Works.
6. Cultures.
7. War (Commander in Chief).
8. Navy (Vice-Admiral).

All public service appointments, both civil and military, are made by the Governor-General, with the exception of the following, who receive their commissions from the Home authorities:

2. President of the High Court of Justice.
3. Attorney-General.
4. President and Officers of the Auditor-General's Department.
5. Vice-Admiral.
6. Commander in Chief.
7. Generals—Major of Infantry.
9. Chief of the Intelligence Service (General Staff).
10. Commander of the Second Military Division of Java at Samarang.

The rank of General Major is between that of Colonel and Lieutenant-General.

*These appointments can also be made by the Governor-General.*
The Order of Precedence, and the annual remuneration, are as follows:

- Governor-General (exclusive of allowances) ... £11,000
- Vice-President of the Council ... 3,000
- Lieutenant-General ... 2,680
- Vice-Admiral ... 2,500
- Members of the Council ... 2,400
- Chief Secretary ... 2,000
- Directors ... 2,000

Provincial Government of Java.

Java is divided into sixteen Residences, and the Island of Madura constitutes a seventeenth.

At the head of each Residency is a Resident, with from two to six assistant Residents. Each Resident represents the authority of the Governor-General in the province of his jurisdiction, an area roughly of 3,000 square miles with a population of 1,700,000 people. His duties are numerous and important. He combines administrative, minor legislative, judicial, and fiscal functions. It is his duty to protect the natives from oppression, and to maintain and extend economic development and education.

A Residency is divided into from two to six divisions, in each of which is an Assistant Resident who is empowered to exercise all the above functions (except legislation) under the supervision of the Resident. The Resident corresponds directly with the Governor-General or with the various chiefs of departments (Directors) according to the nature of his communications.

The Controleurs are the last in the European administrative organization, and are divided into Controleurs and “Aspirants.” They have been termed the “nerves and sinews” of the administration; they come into daily touch with the upper strata of the native organization; they see that the commands of the Resident are enforced, settle minor disputes, supervise the collection of native taxation, and exercise generally an important influence on the general administration.

Native Organization.

The Regents are nominally at the head of the native organization, but in actual practice they have few executive functions and little real authority, although possessing great influence with the natives by reason of their dynastic prestige and Mohammedan religion. The administration, while appropriating the real authority, has wisely allowed them to maintain the outward semblance of rulers, thus preventing the appearance of violent change in rulership that is especially injurious in an oriental community. The number of Residents and Assistant Residents nearly corresponds with the number of Regents, and the former generally have their headquarters near the court of each Regent. The Regents are of princely or noble rank, and the Governor-General in appointing them endeavours, as far as possible, to maintain an hereditary succession. In this way the Government retains the form and prestige of the old line of native rulers from whom the Regents are descended.

The Resident and Assistant Residents issue their instructions through the Regent in the form of “recommendations” or as instructions of the central Government. They hold the title of “Elder Brother,” a position which, according to the customs of the East, entitles them to the obedience and respect of their “younger brothers” the Regents.

The District Heads (Wedanas) and the Under District Heads (assistant Wedanas), also natives of important families, number some 1,500. They collect the taxes and inform the natives of the commands and requirements of the Government.

Last of all is the village headman, corresponding with our village constable in Papua. He is called “Belief” in Middle and East Java, and “Loeheh” in West Java. The headman assist the superior officers, superintend the village, apportion to individuals the communal tax, and are responsible for the maintenance of law and order in the village. They receive no salary from the Government, but are allowed to retain 8 per cent. of certain taxes which they collect. An interesting phase of the native organization is the fact that the village headman is elected by the villagers.

Thus we see in the subordinate native officials the germ of electoral representation.
The only variations in this general system of government that I have sketched are in the Residencies of Djokjakarta and Soerakarta. These districts represent, in a much diminished form, the great Mataram Kingdom, and the present ruling Sultans are the direct descendants of the dynasty that ruled all Java before the arrival of the Dutch, and against whom the Dutch, French and English waged war from 1629 to 1825. The Soesoehoenan of Soerakarta takes precedence over all other Javanese, and is the head of the Mohammedan religion in Java. He receives an annual subsidy of £73,750 a year from the Dutch Government, and a larger sum from his vast estates. The Sultan of Djokjakarta ranks next to the Soesoehoenan, and receives an annual subvention of £89,387, in addition to a large agrarian revenue. In each of the Residencies of Soerakarta and Djokjakarta there is also an independent prince, who rules over a certain portion of territory and is not subject to the Sultans. These rulers are invested with great power over the natives of their territories. The Residents at the Courts of the Sultans, while occupying the same position as the other Residents towards the white population, are political agents for native affairs.

It is probable that a drastic change will be made in the provincial government of Java before very long with a view to simplify and decentralize administration. Consideration is being given to the advisability of dividing Java into three provinces, East, Central, and West, and of appointing to each a Governor at £1,500 per annum. This will make it possible to do away altogether with the Residents, while the Assistant Residents will be advanced somewhat in status and salary.

The authorities in Java are also anxious to be invested with power to float colonial loans with a view to the more speedy development of their possessions.

**Method of Legislation.**

The statute laws of Java emanate from five sources and are called, respectively:

1. Laws.
2. Royal Decrees.
3. Ordinances.
4. Regulations.
5. "Keuren," or Minor Regulations.

The "Laws" are drafted by the Minister of Colonies, and are enacted by the Queen and the Netherlands Parliament. The laws thus passed (exclusive of the annual Budget) are few in number, some fifteen or twenty altogether, and comprise the constitution of Netherlands-India and important laws dealing with broad principles of colonial policy.

The Royal Decrees are numerous. They are drafted in Holland under the instructions of the Secretary of Colonies, and are passed by the Queen without reference to Parliament.

The remaining three classes of legislation are enacted in the colonies.

The ordinances are passed by the Governor-General in Council and relate principally to administrative matters. The most interesting and important function of this legislature is to decide the method of collection of any particular tax that has been imposed on Netherlands-India by the States-General (or Parliament) of Holland. For instance, in the Estimate of Revenue to be received from various taxes given on page 44 of this report, a sugar tax amounting to £73,383 is set down. The form this tax will take has not yet been decided. The States General, in discussing the annual Budget, decided to raise this sum of money by a sugar tax, but the method of collection is left to the Governor-General in Council, and may take the form of an export duty, a tax on sugar growers' profits, or a tax on the area cultivated.

The Regulations are passed by the Governor-General without reference to the Indian Council. They usually take the form of minor amendments or amplifications of legislation already in existence.

Lastly the "Keuren" or minor regulations are made by the Resident. They are unimportant by-laws relating to local administration, and must receive the assent of the Director of Justice before being enacted.

Last year the Dutch inaugurated a system of municipal government in Java. In 1905 three municipalities were created. At present there are no less than sixteen in existence.
The councillors are nominated by the Government from the official and non-official inhabitants, not necessarily Dutchmen. The Municipal Act empowers the Councils to impose taxation, provided the consent of the Governor-General is first obtained. Up to the present no taxation has been imposed, the municipalities relying solely on the Government for their revenue.

In Soerabaja (the commercial capital of Java) the Council consists of 23 members, sixteen Europeans (ten official and six non-official, one of the latter being British), three Chinese, three Javanese, and one Arab. The Act further provides that after three years the non-official members may be elected by the citizens.

**CHAPTER VII.**

**Legislation and Administration.**


**System of Taxation.**

The sources of revenue and the systems of taxation in Netherlands-India are numerous and varied, and have not up to the present been fully and correctly indicated in any English publication, so far as I am aware. They can be ascertained only by an exhaustive search through the Dutch Blue-books, or (as in my case) from the Central Administration. Separate systems of taxation are imposed on the white and coloured populations, except in regard to Customs duties; and considerable revenue is derived from State monopolies, State plantations, various public services, and royalties. Actual taxation provides only 47 per cent. of the total revenue.

**Revenue.**

The total revenue from ordinary taxation is £4,773,751; from Government monopolies, £2,857,871; from royalties, £360,334; from State plantations, £546,792; from Government services, £1,655,258. Total, £10,196,006. The following table gives the amount of Revenue collected under each head:

<table>
<thead>
<tr>
<th>Revenue Description</th>
<th>£</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Custom Duties</td>
<td></td>
<td>1,659,012</td>
</tr>
<tr>
<td><em>Taxes on White Population.</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) Property Tax</td>
<td></td>
<td>81,666</td>
</tr>
<tr>
<td>(c) Income Tax</td>
<td></td>
<td>219,500</td>
</tr>
<tr>
<td>(d) Verponding</td>
<td></td>
<td>191,100</td>
</tr>
<tr>
<td>(e) Sugar Tax</td>
<td></td>
<td>75,683</td>
</tr>
<tr>
<td>Succession Duties</td>
<td></td>
<td>10,167</td>
</tr>
<tr>
<td><strong>576,016</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>†Taxes on the Coloured Population.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(f) Land Tax</td>
<td></td>
<td>1,612,000</td>
</tr>
<tr>
<td>(g) Poll Tax</td>
<td></td>
<td>283,750</td>
</tr>
<tr>
<td>(h) Labour Tax on Natives and Orientals</td>
<td></td>
<td>270,750</td>
</tr>
<tr>
<td>(i) Slaughter-house Tax (principally paid by natives)</td>
<td></td>
<td>162,167</td>
</tr>
<tr>
<td>(j) Tax on Native Vehicles</td>
<td></td>
<td>26,583</td>
</tr>
<tr>
<td><strong>2,255,250</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sundry small taxes.</td>
<td></td>
<td>185,413</td>
</tr>
<tr>
<td><strong>Government Monopolies.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(k) Opium Monopoly</td>
<td></td>
<td>1,657,546</td>
</tr>
<tr>
<td>(l) State Tin Mines, Banka Island</td>
<td></td>
<td>71,525</td>
</tr>
<tr>
<td>(m) Salt Manufacture</td>
<td></td>
<td>1,010,167</td>
</tr>
<tr>
<td>(n) Coal Mines (Sumatra)</td>
<td></td>
<td>66,083</td>
</tr>
<tr>
<td>(o) Public Auctions</td>
<td></td>
<td>52,550</td>
</tr>
<tr>
<td><strong>2,857,871</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Royalties.</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(p) Royalties on Billiton Tin Mines</td>
<td></td>
<td>150,000</td>
</tr>
<tr>
<td>(q) Revenue on Railway and Tramway Concessions</td>
<td></td>
<td>114,667</td>
</tr>
<tr>
<td>(r) Revenue from Pawnshop Farms</td>
<td></td>
<td>95,667</td>
</tr>
<tr>
<td><strong>360,334</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Equal to 96s. 8d. per head, exclusive of Custom Duties.
† Equal to £1. 30s. per head, exclusive of Custom Duties.
### Government Plantations

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee</td>
<td>218,708</td>
</tr>
<tr>
<td>Cinchona</td>
<td>38,417</td>
</tr>
<tr>
<td>Teak Forests (not yet bearing)</td>
<td>259,667</td>
</tr>
<tr>
<td>Gutta Percha</td>
<td></td>
</tr>
</tbody>
</table>

### Government Services

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue from 21 Government</td>
<td></td>
</tr>
<tr>
<td>Pawnshops</td>
<td>115,383</td>
</tr>
<tr>
<td>Postal Department</td>
<td>143,458</td>
</tr>
<tr>
<td>Telegraph Department</td>
<td>78,500</td>
</tr>
<tr>
<td>Stamp Duties</td>
<td>111,500</td>
</tr>
<tr>
<td>State Railways</td>
<td>1,206,417</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,655,258</td>
</tr>
</tbody>
</table>

**Total**

![Image](https://via.placeholder.com/150)

Of this total Java contributes about £7,790,000.

Custom duties are imposed for purely revenue purposes. The Tariff ranges from 6 to 10 per cent. on imports with only a small free list which includes cattle, horses, coal, agricultural implements, steam-engines, and raw metals. No preference is given to the mother country. The duties are nearly all *ad valorem*. A peculiar feature in the working of the Act is that no invoices are required by the authorities, and no undervaluations are possible. The Government requires merely a correct schedule of the goods that are imported. The Director of the Department of Finance issues every quarter a manual containing the current prices of all goods imported. The *ad valorem* duties are calculated on these, and not on the immediate fluctuations of the market.

Export duties are imposed on four articles only—Hides, 2 per cent.; tobacco, 1s. 8d. per 100 kilos.; tin, 6s. 10d. per 100 kilos.; and edible bird nests, 6 per cent.

The property tax is 5 per cent. on the rent of a house, 2 per cent. on the value of the furniture, 10s. a year on every horse kept, and 5s. for each wheel, including bicycles.

The income tax is progressive, ranging from 2 to 4½ per cent. on incomes resulting from personal exertion only.

The verponding is a tax on real estate—5 per cent. on the improved value of the property. It is levied on the owner and not on the occupier. For business houses, shops, and private residences the valuation is ten times the annual rental. For factories, broad acres (freehold or land held under a 75 years’ lease) the tax is estimated on the selling value. The verponding is not imposed on land leased by Europeans from the natives for short terms for the growth of sugar, tobacco, &c., as this land is subject to the native land tax.

The sugar tax, amounting to £73,583, originated in the following manner:

The Dutch Parliament of Holland decided, in discussing the annual Budget of Netherlands-India, to raise this sum by a sugar tax, and it was therefore included in the Budget without any instructions as to its method of collection. Instructions have been sent to the Governor-General to frame an ordinance. This has not yet been enacted, but will be passed by the Governor-General in Council, and may take the form of an export duty, or more probably a percentage of the net income from each sugar estate.

The native land tax was first imposed by Sir Stamford Raffles in 1812, and has been continued ever since. If the village lands are held on the communal system, the area is assessed at a lump sum, and the village headman apportions the amount paid by each individual. The tax ranges from 3 per cent. to 16 per cent. of the annual production.

The poll tax amounts to one guilder (1s. 8d.) a year, and has to be paid by every worker. It was imposed as a substitute for many compulsory services that he was formerly compelled to perform.

The labour tax corresponds with the income tax on the white inhabitants. It amounts to 2 per cent. in the case of the natives, and 4 per cent. on oriental immigrants.

The slaughter house tax is imposed on domestic animals killed for food. Before a cow or buffalo is killed a permit costing 3s. has to be obtained, for every horse (eaten by the natives) 6s. 6d., and for every pig 2s. 6d.
The tax on native vehicles is £1 a year for a two-wheeled vehicle, and £3 per annum for a four-wheeled cart or trap.

The Government prohibits the growth of opium in Netherlands-India, and its importation by private individuals. All opium is imported and sold by the Government in Java. In some other parts of Netherlands-India it is farmed out. Besides the Chinese some of the natives are addicted to the opium habit.

The tin mines on Banka Island, separated by a narrow strait from Sumatra, are owned by the Government, and are worked by Chinese labour.

The salt is obtained principally on the island of Madura, near Java. It is prepared by the natives under European supervision, and sold at a low price to the Government.

The coal mines, situated in the island of Sumatra, belong to the Government, and are worked by Chinese or prison labour.

Private auction sales are prohibited. All auctions are conducted by the Government. For furniture and other small sales the Government charges the seller 2 per cent. and the purchaser 6 per cent. For houses and land a less commission is demanded. The Government pays over the purchase money immediately to the seller and incurs the risk of collecting the money from the purchaser.

The tin mines of Billiton Island (near Banka Island) are owned by private companies. The Government exacts a royalty of 8 per cent. of the output.

On all privately-owned railways and tramways the Government imposes a tax, varying in its percentage, on the net revenue of the companies.

The Government calls for tenders annually (as in the Federated Malay States) for the right to conduct pawn-shops. There are about 1,000 of these, all owned by Chinamen.

The Government coffee plantations are the last vestige of the old "culture" system introduced by Van den Bosch, in 1832. In the neighbourhood of the Government coffee gardens the natives are obliged to attend to the cultivation of the trees, and to prepare and deliver the coffee into Government stores at 2½d. a pound. Each native has to attend to not more than 50 trees a year.

The Governments conduct 24 pawn-shops in Java. The experience has been that the Chinese charge usurious rates of interest, and often treat the simple natives unfairly in other ways. It is probable therefore that all the pawn shops will gradually be taken over by the State, especially as a larger revenue than from the farming-out system would be obtained.

EXPENDITURE.

Since the year 1878 there have been occasional years in which the finances of Netherlands-India showed a surplus, but the general tendency has been in an opposite direction. Any surpluses since the above date have not been appropriated by the Home Government as was formerly the case, and the money required to make up the more numerous deficits has been lent by the Home Government to Netherlands-India.

Below is a comparison between the Expenditure set down in the Budget of this year and the Expenditure of 1870, and 1900.

<table>
<thead>
<tr>
<th>Departments</th>
<th>1870</th>
<th>1900</th>
<th>1906</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior Government</td>
<td>£62,417</td>
<td>£92,333</td>
<td>£92,025</td>
</tr>
<tr>
<td>Justice</td>
<td>£260,083</td>
<td>£444,167</td>
<td>£486,318</td>
</tr>
<tr>
<td>Finance</td>
<td>£362,063</td>
<td>£1,068,667</td>
<td>£1,284,217</td>
</tr>
<tr>
<td>Internal Administration</td>
<td>£3,750,417</td>
<td>£2,163,167</td>
<td>£1,929,482</td>
</tr>
<tr>
<td>Education, Religion, Industry</td>
<td>£576,593</td>
<td>£1,385,417</td>
<td>£1,633,441</td>
</tr>
<tr>
<td>Agriculture</td>
<td>£551,509</td>
<td>£531,509</td>
<td>£531,509</td>
</tr>
<tr>
<td>Public Works</td>
<td>£600,833</td>
<td>£1,824,083</td>
<td>£2,182,727</td>
</tr>
<tr>
<td>War</td>
<td>£1,526,086</td>
<td>£2,104,500</td>
<td>£2,226,908</td>
</tr>
<tr>
<td>Navy</td>
<td>£392,250</td>
<td>£381,167</td>
<td>£402,902</td>
</tr>
<tr>
<td>District and Local Administration</td>
<td>£94,922</td>
<td>£94,922</td>
<td>£94,922</td>
</tr>
</tbody>
</table>

£7,201,352 £9,753,501 £10,805,006

The Department of Agriculture has only lately been created, and the district and local administration includes the recently formed Municipal Councils.
If Java had a separate Budget a considerable surplus would be shown, but that island has to carry on her back the outlaying possessions where industries do not exist (as in Dutch New Guinea), or where they are being fostered and developed, and at present afford little revenue.

By the above table the cause of the deficits is partly explained. There has been a largely increased expenditure owing to the sporadic outbreaks of guerrilla warfare in the Achin district (N.W. Sumatra), and there have been large increases in the money spent on education and public works. The former increase evidences the care and attention bestowed by the Government on their native subjects.

All public works are constructed out of revenue, including railway construction, schools, hospitals, irrigation, and harbor schemes.

Under the head of industry is also grouped the expenses in connexion with the tin, coal, and salt monopolies.

These items of increased expenditure, in conjunction with the loss of revenue caused by the coffee blight of 1879, which ruined many plantations, account for the unsatisfactory Budgets of late years.

The greatly reduced expenditure under "Internal Administration" has resulted from the practical cessation of the culture system, which accounted for no less than two millions of the expenditure in 1870, whereas to-day it is less than £500,000. Similarly the large increase in the Department of Finance represents the cost of the tax system that replaced the forced cultures.

**LAND LAWS.**

All the lands of Netherlands-India, with the exception of a small area in Java held under freehold rights, are the property of the State. The land occupied by the natives is held under hereditary right of possession, either by individuals or in communal holdings, for which they pay the Government a land tax or land rental of from 3 to 16 per cent. of the annual value of production. In communal holdings the natives live in a village, or kampong, and their lands are jointly held. Each head of a family is apportioned a certain area of irrigated rice land, and the produce of this belongs to him after he has paid the land tax or land rent set down for that area, as well as the poll tax and labour tax. The following year the lands of the village are redistributed, so that no individual can monopolise the more fertile portions of the village lands. In the case of communal holdings the Government assesses the whole area at a lump sum, and the village headman, who is ejected by the people, apportions the amount amongst the various individuals. Roughly speaking, about one half of the native agricultural land is held under the village communal system, and one half individually. It is illegal for the natives to sell their land to Europeans or to any immigrant race, though they are permitted to dispose of their tenures to each other. This humane law is also in force in Papua, and has prevented the perpetration of many injustices upon the simple natives. The policy of the Dutch Government in Netherlands-India has always been opposed to the alienation of any land from the Crown, and no freehold land can be obtained at the present day. But, during the British occupation of Java (1811-1816), Sir Stamford Raffles, in order to obtain sufficient funds to carry on the Government, sold considerable areas of land in fee simple to Europeans and Chinese, including lands cultivated by the natives and native villages. The total area of this "particuliere landeryen" is 2,681,000 acres, and is the only freehold land in Java.

Under the agrarian law of 1870, opportunities were afforded white settlers to obtain unused land on lease for a term of 75 years at a quit rental ranging from 6d. to 5/9 an acre. The area of land thus held is 1,143,196 acres, of which 520,975 acres are cultivated; the crops being chiefly coffee, tobacco, tapioca, and cinchona. No applications for leasehold are entertained if the lands desired are under cultivation by the natives. Europeans are also allowed to rent land for a few years from the natives with the consent of the Government, but in no case is the individual native—or community, as the case may be—allowed to rent more than one-third of his or their land at one time.

**THE CIVIL SERVICE.**

Dutch officials enter the service between the ages of 20 and 25 years. They are required to pass an examination in Holland or Netherlands-India before they are
appointed. This is open to all Dutch students who have graduated from a high school—thus ensuring that they possess a good general education. The examination is divided into two parts: a preliminary and a final, and embraces the history, geography, ethnology, laws, institutions and customs of Netherlands-India. A knowledge of the Malay and Japanese languages is also compulsory. He joins the service in Java or the other possessions as an “official at disposition,” and is either attached to the central or provincial administrations. If he joined the latter, say, in the year 1900 at £200 a year, he may in 1911 become an “aspirant controleur,” at £225. By 1901 he is promoted (if there is a vacancy and his service has been satisfactory) to the position of “controleur” at £300 a year; by 1908 (after eight years’ service) his salary cannot be less than £400 a year, and by 1915 this must be increased to £500.

By 1920 he may become an Assistant Resident at £650, with gradual increases to £900. By 1925 he may become a Resident at £1,250. From this there are only two positions he can rise to—outside of the Central Administration—those of Governor of West Sumatra or the Celebes, at £1,500 a year. The upward progress of the civil servant in this Branch is necessarily slow, as the higher the position the fewer the offices, and he is compelled to work up from the base to the apex of the pyramid.

In the Judiciary, or in other departments, such as Public Works, Forestry, Agriculture, and Education, the civil servants, possessed of some scientific knowledge, receive higher remuneration and quicker promotion.

An official, who has completed 20 years’ service, and has reached the age of 45, may retire on a pension of one quarter of the highest salary he has drawn.

In order to encourage civil servants to remain longer in the service, it is enacted that if they extend their term of service to 50 years, the above-mentioned pension will be increased by one-half, equal to three-eighths of the highest salary. Officials generally retire at or before 65 years of age, although retirement is not compulsory unless on account of infirmity. Besides the general holidays, which are few, a civil servant is entitled to a holiday of one year after ten years’ service, and the passages of himself and his wife and family are paid to Holland and back. If his salary is £250 or under, he receives half-pay; if £500 40 per cent. of his salary, if £750 30 per cent. of his salary, if £1,000 and over 25 per cent., any other special holidays, except for sickness, are granted without pay. In the event of illness the official is examined by a commission of physicians, and if they report that a change is necessary, he is allowed leave according to the duration of his illness up to two years. Even this term may be extended for another year if a commission of physicians in Holland, report that it is necessary. He also obtains a free passage and the same pay as those on ordinary leave.

The following table presents a summary of the official titles and salaries of the Provincial Administration:

<table>
<thead>
<tr>
<th>Title</th>
<th>Number in Netherlands India</th>
<th>Of whom there are in Java</th>
<th>Salaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Organization—</td>
<td></td>
<td></td>
<td>£</td>
</tr>
<tr>
<td>Governors</td>
<td>3</td>
<td>—</td>
<td>1,250 to 1,500</td>
</tr>
<tr>
<td>Residents</td>
<td>32</td>
<td>17</td>
<td>1,250 to 1,500</td>
</tr>
<tr>
<td>Assistant Residents</td>
<td>159</td>
<td>78</td>
<td>650 to 900</td>
</tr>
<tr>
<td>Controlleur</td>
<td>255</td>
<td>119</td>
<td>390 to 500</td>
</tr>
<tr>
<td>Aspirant Controlleur</td>
<td>66</td>
<td>35</td>
<td>225</td>
</tr>
<tr>
<td>Native Organization—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regents</td>
<td>70</td>
<td>70</td>
<td>1,200</td>
</tr>
<tr>
<td>District Heads (Wedanas)</td>
<td>391</td>
<td>391</td>
<td>260</td>
</tr>
<tr>
<td>Under District Heads (Assistant Wedanas)</td>
<td>1,356</td>
<td>1,356</td>
<td>115</td>
</tr>
<tr>
<td>Village Headmen</td>
<td>32,645</td>
<td>32,645</td>
<td>8 per cent. of some of the taxes collected.</td>
</tr>
</tbody>
</table>

Six of the Residents in Java have secretaries, who bear the title of Assistant Residents, making 84 Assistant Residents in all.
CHAPTER VIII.
ECONOMIC CONDITIONS.
Climate—Soils—Native Labour—Transportation—Education—Defence Hospitals—Live Stock.

CLIMATE.

Meteorological observations are carefully registered at numerous stations throughout Netherlands-India, and these are tabulated in instructive publications issued from time to time by the Director of the Batavia Observatory. A thorough knowledge of the climatic conditions of the country, diversified as they are by natural features, is indispensable for the scientific development of agricultural industries.

The mean monthly temperature throughout the year averages 78°62 deg. The variations between the different months are exceptionally small, and do not amount to more than 1°87 deg. F. The two warmest months are May and October, registering 79°50 deg. and 79°46 deg. respectively; while the coldest are January and February, recording 77°63 deg. and 77°70 deg. The variations in temperature between night and day are much greater, amounting to 9 and 10°8 deg. F. The causes responsible for such a steadily high temperature are attributable not alone to the perpendicular rays of the sun, but also, as A. R. Wallace points out, to the warmth of the soil and the dampness of the atmosphere caused by the high temperature of the sea (82°4 deg. to 84°2 deg.) over which the winds sweep.

The amount of rainfall and the difference in distribution between the periods of the N.W. monsoon and the S.W. monsoon show considerable dissimilarity. At Batavia the rainfall is 72-28 inches, of which the N.W. monsoon contributes 51-5 inches, and the S.W. monsoon only 20-78 inches. At Batavia the rainfall from November to April is 97-5, and for the remainder of the year 75-15 inches. In Eastern Java the four driest months are from July to October. On the East Coast the annual rainfall is only 38 inches, while in the interior of Eastern Java it is from 72 to 117 inches. In the interior of the western and middle portions of the island the rainfall is from 198 to 156 inches, while at Tjilatjap, on the South coast, the annual fall is 151-43 inches, of which 87-8 is brought by the S.E. monsoon.

SOILS.

The soils of Java are probably unequalled in the world for fertility, due largely to the fact that a great portion of the surface of the island is covered with comparatively recent volcanic earths.

The western portion of the Malay Archipelago was for several geological periods united with Asia, as the shallowness of the China Sea indicates. An examination of the rocks of Java shows that during the earlier portion of the secondary period Java was raised above the sea-level, and in the earlier stages of the tertiary era was submerged, only to rise again during the later portion of the last-named epoch. The strata of the late tertiary era is broken and folded, constituting with volcanic rocks the prevalent formation of the island. Java at that period consisted of at least eight islands, but the channels between these became filled by volcanic action and with alluvial and alluvial deposits from the seas and rivers.

If we divide up the surface of Java into these various formations we shall find that the rocks that are older than the late tertiary period occupy only 1°16 per cent. of the surface. Rocks of the later tertiary formation cover 37°7 per cent. of the surface, recent volcanic rocks (leucite and phonolith), 27-5 per cent., and alluvial and alluvial deposits of the quaternary period, 33-54 per cent.

Java is, therefore, geologically speaking, a comparatively recent island, and more fertile on that account because the erosive agents—atmospheric, fluvial, and organic—have not exercised such prolonged sway over the surface. They have, therefore, not robbed the soil of its richest plant foods to the same extent as in more ancient lands. Recent volcanic rocks in Java contain from 1 to 1-2 per cent. of phosphoric acid, while the older volcanic formations have only 07 per cent.

It would be more correct to say that the soils of Java are extremely fertile than extremely rich. The warmth of the soil, and a heavy and a fairly evenly-distributed rainfall, are most important factors; and these, combined with a friable soil, in which the plant foods are more soluble than in older formations, account for the wonderful fertility of the island.
As an illustration of the above, I might instance the island of Sumatra, one of the best tobacco-producing lands of the world. At Deli, on the northern coast, some of the finest tobacco on the market is grown, the leaf for cigar wrappers having sold at from 3s. 4d. to 5s. a pound. Tobacco proverbially requires the "richest" soil for its successful production, and yet some of this Deli tobacco-growing soil was sent to Europe for skilled analysis, and the report came back that "they had nothing so poor in Europe." The soil was chemically poor, but it was good mechanical soil, the plant foods were easily soluble, and this, combined with the climate, created the fertility. In Australia tobacco is often grown on land that we class as poor soil, although it is probably chemically richer than that of the tropics.

Plant-foods seem, therefore, to bear some resemblance to animal foods, in that a human being may partake of a certain class of nourishment the whole of which is digested and goes to renew organic waste or create tissues, while another class of foods, richer in proteins, sugars, starches, or fats, is indigestible or insoluble, and, therefore, of little value.

For this reason chemical analyses of the soil are often misleading unless various other factors receive due consideration.

NATIVE LABOUR.

All natives, except the provincial Government officials and a few others, are liable to personal service to the Government, and also to service for their own villages or communities.

The following statement details the number of days of personal service required by the Government in the various districts and the total number of natives in those districts liable to personal service:

<table>
<thead>
<tr>
<th>Provinces</th>
<th>Number of Days</th>
<th>Number of Natives Liabile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bantam</td>
<td>...</td>
<td>32</td>
</tr>
<tr>
<td>Batavia</td>
<td>Domoin Blocker</td>
<td>20</td>
</tr>
<tr>
<td>Purmer Regencies</td>
<td>...</td>
<td>36</td>
</tr>
<tr>
<td>Cheribon</td>
<td>...</td>
<td>36</td>
</tr>
<tr>
<td>Pekalongan</td>
<td>...</td>
<td>33</td>
</tr>
<tr>
<td>Semarang</td>
<td>...</td>
<td>39</td>
</tr>
<tr>
<td>Rembang</td>
<td>...</td>
<td>40</td>
</tr>
<tr>
<td>Soerabaja (North and South)</td>
<td>...</td>
<td>35</td>
</tr>
<tr>
<td>Soerabaja (Bawean Island)</td>
<td>...</td>
<td>8</td>
</tr>
<tr>
<td>Pasoeoman</td>
<td>...</td>
<td>39</td>
</tr>
<tr>
<td>Boesei</td>
<td>...</td>
<td>36</td>
</tr>
<tr>
<td>Bojooman</td>
<td>...</td>
<td>39</td>
</tr>
<tr>
<td>Keboe</td>
<td>...</td>
<td>24</td>
</tr>
<tr>
<td>Madura</td>
<td>...</td>
<td>36</td>
</tr>
<tr>
<td>Kediri</td>
<td>...</td>
<td>36</td>
</tr>
<tr>
<td>Madura</td>
<td>...</td>
<td>12</td>
</tr>
<tr>
<td>Total for Java and Madura</td>
<td>...</td>
<td>3,208,319</td>
</tr>
</tbody>
</table>

Roughly this is equal to about 300,000 natives in continuous employment.

The above statement includes all the provinces except the native Sultanates of Soerakarta and Djakjakarta, where the right of personal service belongs to the Sultans.

It does not, of course, follow that natives are called upon to fulfil the amount of personal service to which they are liable. Many natives are not called upon to undertake any forced labour.

This personal service was enforced in substitution for certain taxes, now relinquished, that where previously levied on the people by the Sultans. The work performed is almost wholly of a nature that indirectly benefits the peasants, and consists of repairs, road maintenance, the upkeep of reservoirs, irrigation channels and drains, in the neighbourhood of the peasants' rice fields or kampongs.

A somewhat similar system is still in force in the Federated Malay States. There, the Government has the right to "kraib" labour; that is to demand 30 days' service from each native peasant in any one year in lieu of a head tax previously exacted by the Sultans. The Government supplies them with good food and lodging.
This practice is now falling into desuetude, and compulsory service is only required for poling boats, carrying, &c., for which the natives are paid a shilling a day. The Sultans still "krah" their subjects without payment.

In the German possessions in the Pacific, most of the roads have been made by the natives under Government direction without pay, and this system was introduced into Papua in a modified form by Sir Wm. McGregor, who had an ordinance passed, compelling the natives to keep open the tracks between their villages.

The last vestige of the old "culture system" introduced by Van Den Bosch, in 1830, is to be found only in the Government coffee plantations (65,196 acres in extent), just as the last trace of the old Corvée system introduced by Daendels, in 1807, is to be found in the limited personal service that is still demanded by the Government from the natives.

The natives in the neighborhood of the Government coffee plantations are obliged to attend to the cultivation of the trees and deliver the coffee in the Government stores at 2s. per lb., each native having to attend to not more than 50 trees per year.

In Java, the natives are almost invariably paid by piecework, and are seldom engaged by the day or week.

The labourers work in the field, from 6.30 a.m. to 11 a.m., and from 3 p.m. to 6 p.m., or sunset. These hours are also kept by the natives working on their own land, and also by the water buffaloes employed by the natives in the paddy fields. If the natives occasionally try to work them after 11 in the morning, when the sun becomes oppressive, the sagacious animal "strikes," and either makes for shade or a waterhole.

In the sugar factories, the natives usually work twelve hours a day.

The highest wage paid for unskilled labour is 30s. a month, and usually from 12s. 6d. to £1 a month; lodging is supplied, but no food. Skilled labour is paid for on a much higher scale. Smiths and carpenters receive from 22s. 18s. 6d. to £3 15s. a month, and native overseers for steam-engines and dynamos sometimes receive £1 per week. In West Java, and especially in the Preanger Regencies, the labour is engaged by agreement. The Boedjing or garden overseer receives about 13s. 4d. a month, and sometimes a daily allowance of 1½ lbs. of rice. Another form of employment is the engagement of natives to keep tea and coffee plantations clean and free from weeds, for 2s. 4d. an acre a month. This system might be followed with advantage in Papua, and thus give light employment to the inhabitants of native villages in the neighbourhood.

Free coolies (without advances or agreement) who work daily or remain home as they think fit, receive very small remuneration, which varies in the different provinces.

For the outlying possessions of other lands-India, coolies, mostly from Java, are engaged by contract.

The tin mines at Banka and Billiton Islands are worked principally by Chinese labour, and the coal mines in Sumatra by Chinese, and, I am informed, native prison labour.

There are 7,117,272 male adult natives in Java, of whom 5,014,218, or 70 per cent. are engaged in agricultural pursuits.

Transportation.

The supremely important question of transport has always received from the Government the most careful attention. From the time of Daendels, who constructed, 100 years ago, a great military road from one end of Java to the other, up to the present time, the authorities have steadily pushed on with roadmaking, harbor construction, river communication and railroad facilities, and a large proportion of the wonderful development of Java, can be assigned to this wise policy.

There are 2,469 miles of railways in the island, of which 1,354 miles of railroads and steam tramways are privately owned, and 1,115 miles belong to the Government. Java has a greater length of railway per square mile than even Victoria, a State that has the best railway communication in the southern hemisphere. The Java railway gauge is 3ft. 6in., with the exception of the private line between
Samarang and Djokjakarta, which is 4ft. 8½in. The passenger fares on the Government lines are first class, 2d. per mile for the first 34 miles, and 1½d. a mile beyond that distance; second class, 1½d. per mile for the first 94 miles, and 1d. for each additional mile; third class, three-tenths of a 1d. per mile for Europeans, and one-fifth of a 1d. for natives.

The whole island is covered with a network of metalled roads which, while not quite so smooth and even as are the roads of the Federated Malay States, are well fitted for bullock-waggon traction or carriage traffic.

Java enjoys the advantage of splendid steamer communication between the world of islands comprising Netherlands-India. Almost every coastal town of any importance is afforded the privilege of regular steamer connexion by one or more of the 49 steamships owned by the Koninklyne Paketvaart-Maatschappy (Royal Steamship Company). These boats are heavily subsidized by the Government, and enjoy a monopoly of the inter-island trade, as foreign vessels, with few exceptions, are not allowed to trade from one Dutch port to another in Netherlands-India. I was informed by His Excellency the Governor-General that he hoped to make such arrangements as would enable one or more of these boats to call at Australian ports.

The total length of telegraph lines is 2,424 miles.

Education.

For the education of European children there are in Java alone 150 Government schools, with an attendance of 19,835 scholars. There are also 298 schools for natives with an attendance of 40,122 scholars. The number of instructors is 777 European, and 1,247 natives.

Defence.

In 1902 the strength of the army was 1,416 officers and 35,220 sub-officers and soldiers, comprising 12,925 Europeans and 23,711 natives. The army is purely colonial, as the Home forces are not allowed to be sent on Colonial service, but individual soldiers and officers are allowed to enlist in the Indian service by permission of their commanding officers. The European and native soldiers are not divided into separate corps, but into separate companies in the same battalions.

Hospitals.

There is a large number of Government hospitals at which poor natives are treated gratis. Besides three large hospitals at Batavia, Samarang, and Soerabaja respectively, there are smaller ones in the several districts.

In Buitenzorg there is a special Government hospital for patients suffering from beri-beri, an endemic disease in Java. At Buitenzorg and Lawang there are Government lunatic asylums in which poor natives are treated free.

The ordinary medicines, such as quinine, &c., are at the disposal of the various Dutch and native Government officials to be dispensed gratis to the population.

In Batavia there is also a medical laboratory where series of lectures are given regarding tropical diseases to the young military and civil doctors.

Stock.

The number of water buffaloes in Java is 2,436,031. They are employed, exclusively by the natives, for the cultivation of their rice fields, the drawing of carts and other purposes.

Of other cattle there are 2,654,809, the oxen are also used for draught purposes and the kine as milkers.

The number of horses totals 418,000. They are never used in agricultural pursuits. The large ones all come from Australia, and are used for riding and driving, while the ponies bred in Java and the surrounding islands are chiefly used in the native conveyances that ply for hire.

There are a few sheep and goats of an inferior class, but they are of little use, as the Dutch and natives seldom eat mutton.
CHAPTER IX.

Agricultural Development.


Comparison Between Java and Papua.

The unrivalled position of Java in wealth and population over the other territories of Netherlands India can be largely assigned to its extraordinary fertility due to the recent volcanic nature of its soil. The island probably contains more volcanoes, active and extinct, than any other territory of equal extent. The substances poured out of these volcanoes are superimposed on the older stratified rocks, creating a soil of exceptional richness.

Java is situated 2,000 miles due west of Papua, and is in exactly the same latitude and in the same isotherm as our Possession. The monsoonal winds blow in the same direction simultaneously in each place, the rainfall is approximately equal and the climate very analogous. While the soil is undoubtedly somewhat richer and more friable in Java on account of greater and more recent volcanic disturbances, still the soil of Papua compares very favourably with that of the Dutch Possessions generally, and is, I believe, only slightly inferior to that of "The Garden of the East," as Java has been rightly called. In fact, the natural conditions obtaining in Papua and Java are extremely alike, and, if the same could be said of the artificial conditions, it could be confidently asserted that any economic plant growing successfully in Java could be grown equally successfully in Papua. Unfortunately the artificial conditions show a wide divergence. The natives of Java have been producing crops from irrigated lands for at least 1,500 years, and are most skilful and practical irrigationists. They also under Dutch guidance successfully engage in cultures that require skilled labour in their production. Other industries again, such as sugar, cannot be attempted without the immediate expenditure of large capital in the preparation of the product for the market. While it is not improbable that all these conditions will in time exist in Papua, it is quite evident that the introduction of industries of this nature would be premature at the present stage. In my investigation into the agricultural development of Java, I have therefore devoted my time principally to those industries that require neither great skill nor large capital in their production; and to those economic plants that do not require an irrigated soil for their successful growth; the only exception I have made is in regard to the sugar industry, which is of immediate importance to Australia, and possibly of future importance to Papua.

Area Cultivated.

A very large proportion of the surface of Java is covered with mountains, only portions of which are cultivable. In spite of this no less than one quarter of the total area is actually under cultivation, while considerable areas are required for pasture. The agricultural land held by the natives has an area of 7,227,587 acres, of which only 163,591 acres are unplanted. The lands of Java can be divided into "sawah" or irrigated land and "tagal" or dry land. By far the largest proportion of the natives' land consists of irrigated paddy-fields, as rice is the staple food. On the irrigated land sugar is also grown. The sugar estates have a total area of 203,535 acres, and the indigo plantations 3,967 acres. Tobacco is planted on 15,046 acres, and the coffee gardens cover 20,518 acres. Besides these in the Sultanates of Djokjakarta and Soerakarta there are 30,187 acres planted with sugar, and 16,975 acres with indigo. Of the land held under leasehold tenure for 75 years 520,975 acres are cultivated. The area of the Government coffee plantations is 65,196 acres; of the Government cinchona gardens 2,356 acres, and of the Government gutta percha plantations 2,625 acres. During the period of the culture system (1882-72) the Government experimented with coffee, sugar, indigo, tea, tobacco, cinnamon, cochineal, pepper, silk, cotton, and other products; but coffee, sugar, and indigo were the only industries that attained commercial success, the former being by far the most important, no less than four-fifths of the total revenue derived by the Government from the various cultures was received from coffee. The coffee blight of 1879 largely ruined this industry, which in that year produced no less than 79,400 tons of coffee, and the competition of aniline dyes greatly reduced the importance of the indigo industry as an item of export. Sugar-growing has had a somewhat chequered career, but has always maintained an important place in the industries of the island, and to-day is the most valuable crop produced under the supervision of Europeans.
Perhaps no better indication can be given of the relative importance of the industries of Java than a statement of the value of each of the principal exports.

<table>
<thead>
<tr>
<th>Product</th>
<th>Value of Export from Java</th>
<th>Value of export from Netherlands-India (including Java)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>47,910,162</td>
<td>47,910,242</td>
</tr>
<tr>
<td>Tobacco</td>
<td>2,279,661</td>
<td>2,663,674</td>
</tr>
<tr>
<td>Coffee</td>
<td>362,178</td>
<td>1,369,921</td>
</tr>
<tr>
<td>Tea</td>
<td>589,920</td>
<td>589,920</td>
</tr>
<tr>
<td>Cinnamon</td>
<td>749,267</td>
<td>343,921</td>
</tr>
<tr>
<td>Rice</td>
<td>381,983</td>
<td>392,011</td>
</tr>
<tr>
<td>Tin</td>
<td>319,527</td>
<td>247,925</td>
</tr>
<tr>
<td>Copra</td>
<td>292,426</td>
<td>1,086,622</td>
</tr>
<tr>
<td>Indigo</td>
<td>175,724</td>
<td>175,724</td>
</tr>
<tr>
<td>Hides</td>
<td>324,375</td>
<td>316,165</td>
</tr>
<tr>
<td>Tapioca</td>
<td>181,743</td>
<td>184,821</td>
</tr>
<tr>
<td>Pepper</td>
<td>158,586</td>
<td>462,895</td>
</tr>
<tr>
<td>Teak and other Timber</td>
<td>154,944</td>
<td>264,132</td>
</tr>
<tr>
<td>Kapok</td>
<td>119,862</td>
<td>136,735</td>
</tr>
<tr>
<td>Cotton</td>
<td>27,457</td>
<td>83,870</td>
</tr>
<tr>
<td>Nutmegs</td>
<td>25,928</td>
<td>273,312</td>
</tr>
<tr>
<td>Mace</td>
<td>9,648</td>
<td>96,991</td>
</tr>
<tr>
<td>Sago</td>
<td>4,246</td>
<td>118,849</td>
</tr>
<tr>
<td>Gutta Percha</td>
<td>2,971</td>
<td>504,444</td>
</tr>
<tr>
<td>Cloves</td>
<td>542</td>
<td>6,363</td>
</tr>
<tr>
<td>Gambier</td>
<td>31</td>
<td>175,957</td>
</tr>
<tr>
<td>Petroleum</td>
<td>13</td>
<td>1,488,598</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>£13,475,302</strong></td>
<td><strong>£19,225,557</strong></td>
</tr>
</tbody>
</table>

The diversification and development of the industries of Netherlands-India have been immensely assisted by the wise and fostering care of the Government, who have spent money lavishly in creating the finest tropical gardens in the world, where almost every tropical plant of beauty, interest, or utility is grown under scientific supervision. Close by are the great Botanical Research Institutes—a maze of detached laboratories, museums, libraries, printing establishments, and offices, constituting a little town in itself. Almost every avenue of tropical botanical research is studied and investigated by professors with every modern appliance and under the best conditions. At the head of this little world of science is Dr. Treub, perhaps the greatest living authority on tropical agriculture—the master mind who has brought all these research establishments and information bureaux into existence, and who has developed the botanical gardens to their present state of excellence. He is the Director of the Department of Agriculture, whose jurisdiction extends over the whole of the Netherlands East Indies. Not only the Dutch colonies, but the whole tropical world, has been placed under an obligation to the Netherlands Government for the valuable investigations regarding tropical flora that they have conducted, and the information they have collected; which is published in various languages and circulated in every part of the civilized world.

The Botanical Gardens at Buitenzorg cover an area of 170 acres. They are under the direction of a curator, two assistant curators, and three assistants, and employ 30 gardeners continually. There are no fewer than 10,000 different species of plant life in the gardens.

The Horticultural Experimental Gardens, under a curator and two assistants, occupy 180 acres with 80 employees. Here are growing 150 different economic plants, all the subject of various experiments. At Tjibodas, situated some distance from Buitenzorg, there is a Government Botanical and Experimental Hill Garden. It is under the control of a curator, and is 80 acres in extent, situated at an altitude of 4,600 feet, and employing 20 men. Here experiments are carried on in connexion with eucalyptus trees, from which quinine is obtained—a drug that has made the tropics habitable for white men. This industry has reached such important dimensions owing to Government assistance that Java now contributes 80 per cent. of the world's supply of quinine. Adjoining the Hill Gardens is a State forest of 400 acres, containing a magnificent representation of the natural tropical flora of that attitude. There are also experimental plots in various parts of the Netherlands East Indies.
Laboratories.

There are thirteen principal laboratories, each employing from one to five scientists, with assistants and other employes. The following is a summary of the investigations conducted in each laboratory:—

1. Experimental Laboratory for investigations regarding rice and all the different plants cultivated by the natives. The object is to improve the quality and yield of the crops, investigate all diseases, and supply information with regard to the growth and rotation of crops. Five scientists are employed at this work.

2. Experimental Laboratory devoted entirely to coffee culture, under the direction of a botanist and a chemist.

3. Botanical Laboratory.—Here a botanist and a mycologist are engaged in practical and scientific pathology, and in studying the life-history and culture of plants.

4. Zoological Laboratory.—Two scientists are engaged in all kinds of zoological work having reference to agriculture and industry.

5. Zoological Laboratory, a branch of the above established in Batavia, in connexion with the fisheries and sea fauna, its aims are entirely practical—one scientist.

6. Laboratory for Agricultural Chemistry.—This important institution employs two scientists and two assistants.

7. Pharmacological Laboratory.—In this a scientist is engaged in investigating the medical properties of native plants. In this interesting work many valuable discoveries may be expected.

8. Bacteriological Laboratory.—In this experiments are conducted regarding bacteria and its effects on animal and plant life, also regarding certain kinds of fungi that are injurious to plantations. Here I found a number of rats in cages contentedly munching bacterialized food. The rats and mice of Java are a troublesome pest in the sugar, rice, and other fields. Last year one of the staff was sent to Europe, and obtained at the Pasteur Institute certain bacteria cultures which, eaten by the rats in corn, kills them in eight or ten days. These dead rats in the fields are eaten by a number of the other rats which, dying in their turn, transmit the disease to others in geometrical progression. The experiments have not yet reached finality, but the authorities are hopeful of good results. This of course is on a different principle to the proposed destruction of rabbits by bacteria in Australia, as in the case of the non-carnivorous rabbit the death-dealing agency must be either infectious or contagious. It is, however, of special interest to Australia, as the destruction of rats in our big cities may be the means of purging the Commonwealth of the plague, which now threatens to become endemic. The experiments in Java will prove if other animal life is immune to the bacillus. One scientist and assistants.

9. Chemical and Geological Laboratory.—A scientist is employed here in studying the development of soil out of rocks, the effects of volcanic and aqueous action, soil analyses and its chemical and mechanical changes.

10. Experimental Laboratory devoted entirely to the study of all matters relating to tobacco grown at Deli, in Sumatra. The three scientists employed here intend to transfer their head-quarters to Deli.

11. Experimental Laboratory, devoted entirely to the study of the culture and preparation of tea and the diseases and pests associated with it—one scientist.

12. Experimental Laboratory, devoted exclusively to investigations regarding Javan tobacco. The expenses of the three laboratories last mentioned are defrayed by planters' associations on a voluntary assessment of so much an acre, the payments of each planter varying with the size of his property, the Government supplying the buildings and appliances without cost.

13. Lastly, there is a large laboratory well fitted up, which is placed entirely at the disposal of foreign scientists who without cost can here carry on their experiments and investigations, with access to the libraries and museums, and the privilege of intercourse with brother savants.

Museums and Other Institutions.

In addition to the laboratories there are the following technical institutions:—

1. Museum of economic botany under the direction of a curator. This is devoted entirely to commercial and technical botany relating particularly to the industries of the country.
2. A museum of the fauna of Netherlands-India.
3. A herbarium in which three botanists are engaged in procuring, arranging and classifying a magnificent collection of dried plants.
4. A library of general and applied science, containing 15,000 volumes, and in addition 12,000 volumes the property of the Society for Natural History.
5. A printing and bookbinding establishment in which Javanese and others are employed in sketching and painting botanical plates, photography, lithography, photomechanical, &c., &c. In fact in all these institutions Javanese are largely employed in positions that require considerable technical skill—for which they show a great aptitude.

Besides the Government plantations of coffee, cinchona, and gutta-percha, employing a large staff of inspectors, there is the Forestry Department, the importance of which the Director of Agriculture has fully recognised. This is under the immediate control of an Inspector General, with a staff of 125 European assistants, and a number of natives, who are located in all parts of the country. The magnificent forests of native teak and other valuable timbers bring in an annual revenue to the Government of over £200,000.

At the experimental station there is an Agricultural College which was opened some three years ago. There are at present 38 students, of whom twenty are in the first year, thirteen in their second year, and five in their third year. When the natives have passed their final examinations in the "Training School for Native Government Servants" they are encouraged to take a first and second years' course at the Agricultural College; so that in their official work as Wedanas, or assistant Wedanas, they can instruct the natives in the proper methods of husbandry.

The Veterinary Department is an important institution, under a Chief Inspector, who lives at Buitenzorg. The members of his staff, numbering between 40 and 50 white men, are stationed in various centres throughout the Indonesian possessions.

**Technical Periodicals.**

The results of all the investigations, experiments, and discoveries of the large staff of technical experts, employed under the supervision of the Director of Agriculture, are carefully tabulated and embodied in no less than six different publications, each appearing at regular intervals. The following is a brief summary of these:

1. "The Annals" giving a general résumé of the work done. These are sent all over the world.
2. "Descriptions of Plants with Plates."
3. "The Bulletin" containing notes of investigations, extracts from Dutch publications and short remarks. All of these are published also in English, French and German.
4. "Annual Reports" on the general work and the results of experiments and investigations, published in Dutch only.
5. Communications regarding entomology, chemical research, analyses of soils. This is a practical report of all the investigations made by the whole staff that would be useful for industrial purposes.
6. Horticultural and agricultural monthly paper containing short notes on various matters which are sometimes amplified in more technical publications.

There is also a large work on "The Flora of Buitenzorg," six volumes have been published, and there are four or five more to follow.

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**CHAPTER X.**

**Plantation Industries.**

Sugar—Cacao—Tobacco—Cinchona—Vanilla—Citronella Grass—Cloves.

The economic plants that are cultivated both in the Federated Malay States and Java have, for the sake of reader reference, been described in my report on the former country. In this chapter I have confined myself practically to those economic plants suitable for Papua that are grown only in Java.
Sugar.

As Java is one of the largest producing countries of cane sugar in the world, some particulars of the method and cost of production will be of interest to Australia, and may be of use in the future to Papuan.

The whole of the sugar in Java is grown on irrigated land and on soil owned by the natives, and not by the white people. The irrigated paddy, or rice fields, are the lands utilized for this purpose. The natives are allowed to rent to white people on short tenure not more than one-third of their land, so that the remainder may be used for growing rice (their staple food), or other crops, such as tapioca, indigo, &c. In the case of a Communal village, where the lands are jointly held, the planter comes to terms with the villagers and rents one-third of the area for eighteen months; he also, if possible, gets them to agree to rent him another third the following year, and the remaining third the succeeding year. Having arranged with the village, the planter and the village headman go before a Government official, who records the agreement and sees that the money is paid over to the native for the first eighteen months' rental, and the deposit of perhaps 5s. an acre on the remainder of the land to be rented during the second and third years. The Government official generally seizes the opportunity for impounding the land, poll, and labour taxes on the natives for the year, as otherwise it is not always easy to obtain. The natives, with that improvidence which is characteristic of the whole of the Malay race, generally squander the balance in a few days or weeks. The same process is gone through in the case of individual holdings. A sugar estate, with its own "fabrik" or mill, generally has an area of from 1,200 to 1,500 acres. The plantation is by no means compact, but spread all through the paddy fields, an acre in one place and five to ten acres or more in another. In planting the "Reynoso" system is generally adopted (deep parallel furrows with high ridges between, on which the cane is planted) with the irrigation channels running across at right angles.

The total area under sugar cane in Java is 233,520 acres, and there are 180 sugar mills equal to 1,300 acres per mill; of these mills 20 are owned by Chinese and 160 by Europeans.

After providing for the very large local consumption of sugar by 30,000,000 people the balance is exported. Last year sugar to the value of over £7,000,000 was shipped. The manufactured sugar is classified by numbers from 12 to 18 according to purity. Nos. 12 to 14 are called "muscovado" and contain 96½ per cent, of pure sugar. No. 18 is over 98 per cent. Not much sugar is refined to great purity in Java and goes into local consumption in that state, but a considerable amount is shipped to Hong Kong refineries. Apart from the fact that all sugar in Java is grown on irrigated land there are other striking divergences in the method of production in Australia and Java.

Instead of allowing the cane to grow up again after cutting, and thus make one planting do for several years, the cane in Java is freshly planted every year and seldom on the same ground twice in succession, two crops of paddy usually intervening.

In Java the roots of the sugar cane are crushed as well as the stem, a considerable amount of sugar being obtained from the former; this, I believe, is never done in Australia, and is a matter that might receive consideration when fresh planting is contemplated.

Though the price of sugar is not so high now as it was last year, planters are very confident that they can produce sugar profitably against any competition, whether from beet or cane, and a considerable amount of capital is being invested in the industry. Previously the molasses, after all the sugar possible had been extracted, was thrown away. The growers have now found a market for this product in British India, though the present price is only about 5s. 6d. a ton.

To give a correct idea of the cost of sugar production and manufacture in Java, I append a précis of the returns—certified to the Government as correct—of two plantations, one in Soerabaja, East Java, and one in Banjoemns, Central Java. The cost of production of sugar on one bouw (1½ acres) of land, worked on the "Reynoso" system in the Residency of Banjoemns, Central Java.
Rent of ground (18 months)  
Plants and planting material  
Working expenses:  
Irrigation channels, large and small  
Ridding for planting  
Planting  
Cost of water supply and distribution  
Weeding and keeping ground clean  
Replacing with fresh plants those that have died  
First manuring  
Second  
Third  
Trashing  
Cost of fertilizer (sulphate of ammonia)  
Watching for animals or thieves  
European and native employees  
Cost of cane cutting  
Transport by rail of 85 tons cane  
General expense, weighing, &c.  
Total cost  

<table>
<thead>
<tr>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>0</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>12</td>
<td>6</td>
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</tr>
<tr>
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</tr>
<tr>
<td>3</td>
<td>4</td>
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<tr>
<td>16</td>
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<tr>
<td>1</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>25</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>

For £25 1s. 8d. one can produce and deliver at the sugar mill 85 tons of cane. In Banjumas an extraction of 10-5 per cent. can be generally relied upon, this gives 8 tons 18 cwt. 2 qr. of unrefined sugar. The cost of manufacture in a modern sugar mill of the above is £12 5s. Cost of producing cane and delivery at mill. £25 1s. 8d. Total cost sugar production, £57 6s. 8d. To this add 10 per cent. depreciation of factory and plant. £6 5s. Interest, administration, and management, £1 3s. 4d.—£10 8s. 4d. Total expenses for 1½ acres, £17 15s. 

Cost of sugar production per ton  
Present price of "Muscovado"  
The price last year averaged per ton  

<table>
<thead>
<tr>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

The following table gives the cost per pikul (136 lbs.) of sugar production on an estate in Scoorabaja for the years 1902, 1903, and 1904:

<table>
<thead>
<tr>
<th>Particulars (Sugar Nos. 12 to 18).</th>
<th>1902.</th>
<th>1903.</th>
<th>1904.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff, and bonus to same</td>
<td>£44</td>
<td>£47</td>
<td>£382</td>
</tr>
<tr>
<td>Planting</td>
<td>2985</td>
<td>2107</td>
<td>1634</td>
</tr>
<tr>
<td>Transport of cane to factory</td>
<td>804</td>
<td>925</td>
<td>805</td>
</tr>
<tr>
<td>Milling</td>
<td>219</td>
<td>213</td>
<td>239</td>
</tr>
<tr>
<td>Packing</td>
<td>139</td>
<td>19</td>
<td>207</td>
</tr>
<tr>
<td>Transport in port of shipment</td>
<td>3</td>
<td>363</td>
<td>203</td>
</tr>
<tr>
<td>Upkeep and wearing-off machinery</td>
<td>142</td>
<td>112</td>
<td>208</td>
</tr>
<tr>
<td>General charges</td>
<td>277</td>
<td>116</td>
<td>109</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4695</td>
<td>4338</td>
<td>3877</td>
</tr>
</tbody>
</table>

The total cost of sugar production per ton is therefore £6 6s. 1d., £6 0s. 7d., and £5 7s. respectively.

**Cacao.**

Cacao, or cocoa, can be grown profitable only on certain soils and situations, between the fifth and twelfth degree north or south of the equator. The tree grows to a height of 15 to 25 feet, and requires an altitude of 1,500 to 2,500 feet, a deep rich vegetable soil, well drained, and plenty of moisture. The holes for planting should be dug 14 feet apart, and at 7 feet from each cacao tree bananas should be planted in line with the other trees. The cacao seed, when planted, should

*This is exceptionally heavy. Sulphate of ammonia costs in Java at present £14 10s. a ton.*
be covered with one inch of finely pulverized soil, the ground should be kept loose and well weeded round the trees. The caeno tree begins to bear at four years, matures at ten, and should live 60 or 80 years. The fruit, which is produced all the year round, is elliptical in form, 7 to 10 inches in length, and from 4 to 6 inches in diameter. Each pod contains from 20 to 30 seeds or beans, which are embedded in a pink pulp. The best varieties to grow are the "sanguinolenta" (red), forastero (green), and criolo (yellow); a good average plantation should yield four or five bags (186 lbs. each) to the acre, worth £18 to £20. When the pods are ripe they are cut off and piled in heaps under the trees for 20 hours; they are then split open and the seeds with their coating of pulp are carried in trays to the fermenting boxes, where they are subjected to a process of fermentation for periods varying from five to ten days, according to circumstances. They are then placed in thin layers on drying trays exposed to the sun's rays, and occasionally turned over with rakes; care must be taken to protect them from the rain: when thoroughly dry they are bagged for export. The caeno trees are often troubled with various insect pests, of which the helenoptis is the most dangerous.

This is an industry that Mr. Carruthers, the Director of Agriculture for the Federated Malay States, thought we should certainly try in Papua. Dr. Trench, the Director of Agriculture for Netherlands-India, thought it should be tried, and predicted success, if properly cultivated, provided the insect pests do not injure them.

**Tobacco.**

Next to sugar this is the most important plantation industry in Java—the area planted is 15,016 acres, and the value of the exports last year was £2,279,661. The plant requires the most fertile land and a good deal of attention while under cultivation. The seeds are planted in a nursery, and in 40 days' time the young plants are ready to be transferred to the plantation. They are planted 2 feet apart, or 1½ feet apart, and 3 feet between the rows; and in three months the leaves should be ready to pick. When the plant begins to blossom the top is picked off, so that the leaves will develop to a greater size. The lower leaves are ready for picking first, and are gathered as soon as they begin to show a tinge of yellow. Tobacco in Java is usually grown by the natives under European supervision. The latter comes to an agreement with the native to plant a certain area with tobacco, undertaking to pay him so much a pikul for the leaf on delivery. The value of "Krossac" tobacco, used for cigar filling, is from 3d. to 4d. a pound, while leaf tobacco is sold up to 5d. and 7d. The tobacco of Java is not equal in quality to the Sumatra leaf, the choice of which, for cigar wrappers, has been sold up to 5s. 10d. a pound.

There is a little cultivation of this plant in the Malay States, but not on a commercial basis, and yet Sumatra, just across the Straits of Malacca, will probably become one of the most important tobacco-growing centres in the world, owing to its possessing a different soil and rainfall distribution.

This is an industry that requires the most scientific treatment and expert knowledge, and for these reasons, if other conditions were suitable, I do not think it could be profitably introduced into Papua. The German New Guinea Company expended considerable sums in tobacco planting without any successful result, and the plantations have been practically abandoned or used for other purposes.

**Cinchona.**

Cinchona is a genus of evergreen tree belonging to the order Rubiaceae, at least thirty-six species have been discovered, of which only twelve or fifteen are of sufficient value to justify cultivation. The trees are indigenous to the western slopes of the main mountain range of South America, and are found in the forests of New Granada, Equador, Peru, and Bolivia; their geographical limit being 10 degrees north and 22 degrees south of the equator. They flourish best at an altitude of from 4,000 to 5,000 feet above the sea level, although they have been noted growing as high as 11,000 feet and as low as 2,600. The trees are valuable solely on account of the bark; from this is obtained quinine, the most valuable tonic and feverish medicine that has ever been discovered. Without the aid of this drug a great portion of the tropics would be uninhabitable for the white man. Three other primary alkaloids are also obtained from the bark quinidine, cinchonine, and cinchonidine, all valuable medicines, the first-named especially so.
In 1854 the Dutch introduced a number of young trees into Java, and as the result of scientific investigation and great attention, State and private cinchona plantations have become a most profitable investment. In British India the cinchona tree was first introduced in 1850. Government and private plantations there now cover thousands of acres, the supply of quinine being chiefly absorbed by the enormous local consumption. The species of cinchona principally grown in Java are:—Cinchona Officinalis, C. Calisaya, C. Ledgeriana, C. Succirubra, C. Pilagynsis, and C. Pseudarzana, some agreeing with certain climates, certain soils, and certain elevations better than others, while the yields of quinine and other alkaloids vary in each species. Some barks have been known to yield as high as 16 per cent. of alkaloids, while others yield little or nothing. It is, therefore, evident that great care is necessary in the selection of the species for cultivation, and in the propagation from vigorous trees of a particular species that yields largely. In the extensive experiments that the Dutch in Java have undertaken regarding soil, climate, and elevation, and in connexion with the selection, hybridization and propagation of the trees, lies the key to their merited success. This combination of science, theory, and practice, has enabled them not only to cater for the requirements of 30,000,000 people, but to export cinchona bark to the value of over half-a-million sterling annually, together constituting 80 per cent. of the world's output.

From two of the cinchona species a hybrid has been produced, called, C. Ledgeriana. The bark of this tree produces a large percentage of quinine, but the tree is not so vigorous or quick growing as the C. Succirubra, whose red bark yields only a small amount of quinine; by grafting slips from the Ledgeriana on to the Succirubra stock, the Dutch have been successful in producing a tree possessing the good qualities of both, a combination of quick growth and good bearing capabiliies.

In India the system has been to remove the bark from the trunk of an eight-year-old tree in alternative strips, so as not to injure the cambium in which the annual growth is formed in exogenous trees. Next year a new bark higher in quinine than the original and equally thick, has spread itself over the wound.

In Java a different, and I believe more profitable method, is adopted. When the cinchona trees are from three to eight years old a whole row is grubbed out and new trees are planted in their place. From the trees that have been removed the whole of the bark from the limbs, stem, and roots is stripped, pounded up, and put into bales for export to Europe. The exact method of preparing quinine and other products is kept a profound secret by the manufacturers. A Government plantation of these trees should certainly be started in Papua.

Vanilla.

This flavoring essence is obtained from the fermented and dried pods of several species of the genus Vanilla. The great bulk of this valuable product is obtained from the T. Planifolia, a native of Eastern Mexico. The plant is a climbing orchid with fleshy stem and leaves, and attached itself by aerial rootlets to the trunk of a tree.

The methods of cultivation vary in different countries. In Mexico the orchid is trained up the forest trees at a distance of ten or twelve feet apart. The cuttings—three to five feet in length—are inserted in the soil to a depth of twelve inches, the upper portions being fastened to the tree. The slips take a month to root, and do not bear for three years. In most other countries, including Java, the young plant is supported on a trellis so that any portion of it can be easily reached by the hand. The reason for this is the necessity for artificial fertilization, as there are no insects in any of the countries except Mexico that will effect the fertilization. The species of bee that will fertilize vanilla plants has not been acclimatized elsewhere. The fertilization has therefore to be done by hand, and if the plant be trained up a tree the flowers are difficult to reach. In the German possessions in the Pacific, I have seen the vanilla plants trained up the trees. When the plant flowers, which it usually does in three years from the time of planting, a little pollen is taken from the stamen and dropped in the pistil. Only the finest flowers of each spike are fertilized, as too many pods tend to exhaust the plant. The pods are from 6 to 12 inches long and half an inch in diameter, they take a month to attain their full size and six months longer to ripen. A plant will usually live about fifteen years. The exact time for cutting off the pod is when it will crackle if pressed
between the fingers. The fragrance is due to the presence of vanillin. This is not present in the fleshy exterior of the pod, but is secreted in the interior, and becomes diffused and developed by fermentation. The amount of vanillin varies according to the species and cultivation of the plant. In Java the yield is 2.75 per cent., which is unequalled elsewhere. The pods are fermented, dried, and exported to Europe.

Vanillin is not alone obtained from vanilla. In Germany, it is produced on a considerable scale from the oil of cloves.

The plant is fairly hardy, and should be tried in a small way by the Government in Papua. The best method of obtaining these orchids is to have them sent in a Wardian case. Heavy rains, while the plant is in flower or pod, often injure the crop.

Citronella Grass.

From Citronella grass (Andropogon wardii) a valuable scented oil is obtained that is used in the manufacture of superior soaps and other articles. In Java there are several large plantations—one of those I inspected being nearly 1,000 acres in extent.

The grass, if planted in good fertile soil, and enjoying a heavy rainfall, grows very quickly. From 10 acres a yield of 12 tons should be cut, and four crops a year can be taken off, totalling 48 tons. This will yield about one-half per cent. of oil, or four hundredweights and four fifths, worth 3s. 10d. a kilogramme, say, £16 16s. The grass lasts twelve years before it is necessary to plant again. To obtain the oil from the grass by distillation a small plant is required consisting of one boiler, costing £250, and a tank and condenser with pipe connexion, costing £85. A round tank, 16 feet in diameter, would be sufficiently large to treat four crops a year off 200 acres, if worked day and night.

While I would not recommend this as a principal crop in Papua, I think it should be cultivated, as in Java, as a catch crop between the rubber or coconut trees. The profits from this crop would be sufficient to pay the cost of maintaining a young rubber or coconut plantation until the trees began to bear. If a number of planters in adjoining properties cultivated this grass, they might purchase a joint plant for treating the crop, either with or without Government assistance.

Clove.

Clove are the unexpanded buds of the clove tree (Caryophyllus Aromatica), and belong to the natural order Myrtaeae. The tree, which is an evergreen, is a native of the Moluccas, or Spice Islands, and grows to a height of 30 or 40 feet.

Clove were one of the principal spices that at first drew the Portuguese, Spanish, Dutch, and English traders to the waters of the Malay Archipelago. The spice is now principally cultivated in Amboyna, one of the Spice Islands, and in Zanzibar; also to a less extent in Java, Sumatra, and the West Indies. The flower-buds are at first pale in colour. They gradually change to green. When the buds are ready for collecting they have again changed, this time to a bright red. The annual yield of each tree is from two to five pounds of cloves. This cultivation, at present prices, is not very profitable, still, I think a few trees should be planted in the Experimental Gardens in Papua.
PART III.

PAPUA.

A summary of the policies and methods of development of the Federated Malay States, Java, the Solomon Islands, and the German Possessions in the Pacific, so far as they are applicable to the Territory of Papua; together with other suggestions regarding its administration and development.

CHAPTER XI

A POLICY OF DEVELOPMENT.

Methods suggested—Industries we should cultivate—Experimental Stations and Nurseries—Land Laws.

Although I have only been requested to furnish a report on the Government and Economic Development of the British and Dutch Possessions in the Malay Peninsula and the Malay Archipelago respectively, I feel that such a report would be inconclusive and lacking completeness, were I not to devote a short space to the special application of the information I have gathered, seeing that the object of my report is to assist in laying down definite lines of economic development in our new possession.

During the last four years, I have twice visited the Territory of Papua, and have travelled through, and carefully studied the method of Administration and industrial development in the tropical possessions of three European Powers—the British Protectorates of the Solomon Islands and the Malay States, the German Possessions in the Pacific, and the Dutch Possessions in the Malay Archipelago. These Dependencies lie all around our Possession, and possess natural conditions very analogous to those in Papua.

As a result of this practical knowledge and investigation, I now submit, in detail, a policy that I believe will develop the natural resources of Papua, and bring us in line with our more progressive neighbours, without necessitating larger financial sacrifices on behalf of the Commonwealth:

1. Land Laws.—The inauguration of liberal land laws by the grant of perpetual leases to settlers with quick possession. A peppercorn rental to be charged for the first ten or fifteen years. These leases should be subject to revaluation at stated periods, at the “unimproved or scrub” value of the land, and also subject to improvement conditions. This system of land tenure is in operation in the Federated Malay States.

2. Transportation.—The immediate opening up of bridle tracks for pack-mule carriage to places where European settlement exists, and to places where such settlement is prevented by inaccessibility. The tracks most frequented to be gradually succeeded by roads for vehicular traffic as occasion permits.

3. Director of Agriculture.—The appointment, without delay, of a thoroughly practical expert in tropical plantation work, as the Director of Agriculture, at a salary of from £100 to £500 a year.

4. Report by an Expert.—We should request the Government of either Ceylon, the Federated Malay States, or the Straits Settlements, to allow their Director of Agriculture to visit Papua and report upon its general plantation possibilities, and those industries that should be specially encouraged. Such a report would be exceedingly valuable as emanating from one with presumably higher qualifications than those possessed by our Director, considering the wide divergence in their remuneration. The Federated Malay States last year obtained in this way a valuable report from Dr. Willis, the Director of the Royal Botanical Gardens in Ceylon; the former possession merely defraying his travelling and other expenses.

5. Government Experimental Stations and Nurseries.—The creation of two experimental stations and nurseries—one near the sea level, to be started as soon possible; the other to be established later at a considerable elevation.

6. Government Plantations.—Plantations of rubber and coconuts near the sea level, and plantations of cineboma, camphor, and gutta percha at an elevation. These to be worked in conjunction with the experimental stations.
7. Experimental Plots.—Small plantations and nurseries throughout Papua at the head-quarters of the resident magistrates and assistant resident magistrates wherever the country is suitable. These could be stocked from the principal nurseries. The labour involved in proposals 5, 6, and 7 could be largely performed by native prison labour as in the Solomon Islands.

8. Gold Mining.—Every possible assistance should be afforded in the development of the immense area of auriferous country in Papua. This is at present the only important industry in our Possession, and the source, directly and indirectly, of nearly the whole of the revenue.

9. Handbook.—A practical and concise handbook should be issued, as soon as certain necessary reforms are instituted, for extensive distribution, containing a short résumé of the steamer time-tables and fares, and information regarding the natural conditions, soil, climate, mineral areas, cost of living, labour supply, land laws; also particulars as to where seeds and economic plants can be obtained, and an estimate of the cost of planting areas with the most suitable trees and crops, and their probable returns. Accompanying this handbook there should be a useful and informative map.

10. Library on Agriculture.—A small library of standard technical works on the cultivation of those plants most suitable for Papua, together with Government periodicals (that are printed in the English language) from all tropical countries where plantation industries are conducted on a commercial scale. A list of these books appears in the Appendix to this report.

11. Meteorological Observations.—Observations regarding rainfall and temperature should be carefully registered daily at the stations of the resident magistrates and assistant resident magistrates, and the reports forwarded monthly to the seat of Government for tabulation. A thorough knowledge of the climatic conditions of the Possession, which vary according to the natural features of the country, is indispensable for the scientific development of agriculture.

12. Indigenous Plants.—As soon as the inaccessibility of the country is in a degree overcome, by the opening up of bridle tracks and roads, a determined effort should be made to exploit the valuable forest timbers, such as ebony, sandalwood, cedar, and teak; the large forests of sago palm should be utilized for their valuable food supply, and the rubber industry should be stimulated by making accessible the indigenous rubber trees. The value of the fibre from the pandanus tree, which grows in great quantities, should also be thoroughly tested.

13. A General Conference.—At least once a year a conference should be held of all the higher executive and administrative officials of the Possession, to discuss matters regarding legislation, administration, Government services, industrial development, and the general policy for the future. This conference, which should be purely advisory in its nature, would tend to create an esprit de corps, and a greater homogeneity in administration than exists at present, while a general expression of information and opinion from all quarters of the Possession would have a distinct educational value for each member. Such a conference is held twice a year in the Federated Malay States, and triennially in the Protectorate of Sarawak.

14. The Health of the White Population.—This is a matter of supreme importance, both from the point of view of those who are already in Papua, and of those who wish to go there. A better and more varied diet, and better medical attendance will, I am convinced, largely mitigate the present condition of things, for which at present the climate is wholly blamed. The health of the population can be much improved by a good supply of wholesome fruit, and many of the fruit trees I have mentioned in my report should be planted in Papua. Better medical attendance could be obtained by the Government, giving a small salary, with private practice, to medical officers at the Yodda and Gira gold-fields.

15. Sale of the s.s. "Merrie England."—Now that we have regular subsidized and unsubsidized steamship services to all parts of Papua, except in the extreme west, the Government yacht Merrie England, costing £7,317 a year in working expenses (irrespective of repairs and maintenance) is unnecessary. She should be at once laid up in Brisbane or Sydney, and sold as soon as a reasonable price can be obtained for her.

16. Wages and Means.—By disposing of the Merrie England a sum of at least £5,000 a year could be saved. This, with other possible economies that could be effected without impairing the efficiency of the Administration, together with the proceeds of the sale of the vessel, would provide sufficient funds to carry out the above reforms, none of which involves large outlay.
We are the last of the nations to take upon our shoulders the burden of a tropical dependency, and our task, coming so late in the day, is lightened by the fact that almost every important problem of subordinate government in the tropics, and almost every difficulty regarding economic development, has either been solved or has been the subject of prolonged investigation. We are enabled, therefore, to initiate our policy of development fortified by the world's knowledge of tropical agriculture, instead of having to acquire wisdom at the price of costly and often disastrous experiment. The policy of the rulers of all progressive tropical dependencies today is to keep themselves in touch with contemporary administration and the latest developments in agricultural research throughout all countries situated within the world's heat belt.

The methods adopted by this "Intelligence Department" of the industrial army are various and interesting, and may be summed up under the following heads:

1. By sending representatives to investigate and study tropical development in other countries.
2. By obtaining standard technical works and Government periodicals from all equatorial Possessions.
3. By engaging an expert with a wide knowledge of agricultural development in the tropics to direct their energies.
4. By inviting those who have successfully inaugurated or expanded the industries of other countries to visit them and suggest the general lines of development most suitable for their territory and people. After their acquisition of overseas territory, the United States sent out two commissioners to inquire into the administration and development of tropical dependencies, while Mr. Alleyn Ireland, the Colonial Commissioner of the University of Chicago, has travelled to almost all equatorial countries, and written several valuable works on tropical colonization. The authorities in Ceylon, in the German Possessions in Java, and in the Federated Malay States, from time to time send capable officers to investigate and report on certain phases of development in other tropical countries, and in this way their energies are directed by the fullest knowledge.

The Industries we should Cultivate.

Dr. Trenb, the Director of Agriculture in Java, when asked what industries we should encourage in Papua, told me that our best course was to choose only a few industries, those that were suitable for the conditions of the Possession, and were reliable and profitable, as nothing would be more injurious than to induce planters to embark in industries that would prove a failure, and thus discredit the country. The two industries that he thought most suitable for immediate cultivation in Papua were rubber and coconut plantations, as the country is well adapted for their culture, the trees are hardy and easily grown, they require no skilled labour in their culture or in the preparation of the product, they are little subject to disease, permanent in their wealth-producing capacity, and most profitable. At the same time there were other industries that should be cultivated, perhaps, not as a principal crop, but as ancillary cultures, allowing their development to rest on proved results.

So far as the agricultural development of Papua is concerned, the Administration would, I think, be well advised in using every effort to induce planters to undertake the cultivation of these two industries, as both are eminently suited for our rich coastal lands, and the inaccessibility of the interior does not intrude as a deterrent factor. As coconuts grow best right on the sea coast, I would further suggest that each planter be advised to cultivate both coconut and rubber trees, the former on the coast, and the latter inland, adjoining the coconut plantation. This mixed cultivation would be preferable to the settler relying on one industry only, the product of which may fluctuate in value.

The greatest difficulty that presents itself to those desirous of encouraging this class of cultivation is the fact that it entails continuous expenditure for at least five or six years before any profit can be reaped, and in this age when almost everything is subordinated to making wealth quickly, this aspect of the question acts as a serious deterrent to the investment of capital in such industries.

I have therefore made it my special care to endeavour to discover a solution of this difficulty, and I am confident that it is to be found in the system adopted in the Malay States and elsewhere, of planting "catch crops" (i.e., crops that give a
quick return) between the rubber and coconut trees. These crops (described fully in Chapters V. and X. of this Report) are maize, Liberian coffee, pepper, tapioca, various fibres, citronella grass, tobacco, sarsaparilla, cocoa, bananas, sweet potatoes and yams. By a careful selection from these it should be quite possible to produce annually sufficient revenue to meet the cost of maintaining the coconut and rubber plantations until they are revenue producing.

**Experimental Stations and State Nurseries.**

Dr. Treub expressed the opinion that it would be advisable to have two experimental stations and nurseries, one near the coast and the other at an altitude not exceeding 2,000 feet, as some plants can only be successfully cultivated near the sea level, while others require a considerable altitude for their prosperous growth.

When I broached the idea of supplying from these nurseries not only all the requirements of the Government, but also of the planters, Dr. Treub said that if the nurseries were to fulfil both these functions they must necessarily be of great size if there were a large number of planters, but if the planters were likely to be few in number it would prove a great incentive to settlement. As settlement in all probability will be slow at first, and only stimulated to large proportions by the success of the pioneer planters, I believe a distribution of plants, possibly at a price sufficient to cover the cost of production, would be a most important factor in initiating development.

If these institutions are to fulfil the largest measure of usefulness in the general developmental policy of Papua, great care must be exercised in the selection of a suitable locality. Many factors must be carefully considered such as climate, soil, drainage, accessibility, elevation and proximity to the principal base of development. The Government Hill Gardens should also be situated as near as possible to those near the coast, to enable the Director of Agriculture to supervise both without unnecessary delay and expense in travelling to and fro. It would also be an advantage if the gardens were situated near the head-quarters of a Resident Magistrate, so that the native prison labour would be easily available.

As soon as a suitable spot has been chosen for the coastal experimental station and nursery, an area of ground should be cleared and a large number of rubber seeds planted, so that in five months' time the Government would be in a position to distribute plants to those who desired to cultivate rubber. For coconut plantations a nursery is not necessary as the nuts are planted in their permanent position as soon as the land is cleared. The other economic plants that flourish near the sea-level, described in Chapters V. and X., should then be planted in plots for use as subsidiary industries, either as catch crops for planters or for trial in small separate plantations. The most useful and easily grown of these should also be supplied to the various Residents, and Assistant Residents, for their experimental plots, together with rubber plants or seeds, provided the soil in the locality is suitable, so that depots for the supply of plants would be established throughout the Possession.

It would not, I think, be advisable to commence another experimental station and nursery at an altitude of 1,500 to 2,000 feet, until the coastal ones and the coastal plantation industries were well under way, as it is hopeless to expect much development in the interior until the country is opened up by tracks or roads. When the hill gardens are established they should be planted with tea, coffee (Liberian and Arabian), cacao, gutta percha, camphor trees, &c. For cinchona, an altitude of from 4,000 to 5,000 feet is required, which would necessitate the selection of a more elevated situation.

**Land Laws.**

The further I have pushed my inquiries into the fields of tropical administration and development the more I am convinced of the wisdom of the Federal Parliament in adopting the leasehold system of land tenure for our tropical dependency. In both the Federated Malay States and Java—the two of the most prosperous of tropical possessions—no freehold land can be obtained on any consideration whatever. At the same time, it is most essential that the leasehold instrument should be of a nature that guarantees a good title to the land. Otherwise, the investor will shun the place, and the investment of capital, by which alone substantial industries can be created, will be prevented.
Undoubtedly the best means to secure this end is to grant perpetual leases subject to revaluation at stated periods on the unimproved or "scrub value" of the land with improvement conditions attached. By this means we at once endow the planter, without heavy initial cost, with a title equal to freehold so far as security is concerned, and at the same time prevent the eyes of the country being picked out, and development prevented by the best and most accessible land being locked up until the energies of others have made it valuable.

In other words, perpetual leases are the same as freehold, except that the owner pays interest (as rent) on the capital value of the land instead of a lump sum. This enables the settler to devote the whole of his capital to developmental work, and at the same time enables the Government always to insist that at least a portion of the land shall be profitably employed either for cultivation or pastoral purposes.

In strongly urging that these leases should be granted on exceptionally easy terms, I would instance the initial difficulty that must be experienced in attracting settlers.

It must be recollected that the supply of good land in the tropics is in excess of the demand, and that the whole tropical world is holding out the land of welcome to intending settlers, and that consequently planters can exercise the widest choice as to their field of operations. It is necessary, therefore, for us to outbid other countries in attracting settlers and capital in spite of the fact that they possess some advantages that we will not or cannot supply.

Nations like the United States and France give substantial preference to Colonial products, which in this era of fierce industrial competition is a privilege of no small value. Others offer monetary advances to settlers at low rates of interest to assist them in the expensive initial stages of plantation work.

Another advantage which territories with established industries possess over us is the greater inducement to establish plantations where others are already in existence, as the cultivator has the example, advice, and assistance of those possessing a thoroughly practical knowledge of that particular industry, while the life is rendered more pleasant by the opportunities afforded for social intercourse. This difficulty regarding the absence of practical example, advice, and assistance, I suggest, should be overcome by the Government plantation, experimental stations, and nurseries, and the efforts of a sympathetic administration.

Another initial difficulty is the belief that other countries possess a superior and more reliable labour supply. While I believe the present labour supply in Papua is a good one, and sufficient to meet all requirements, this prejudice can only be removed by actual demonstration.

I have enumerated the difficulties in order to strengthen my plea for the most liberal land laws. As against the advantages claimed by other countries, we must be prepared to offer others that will more than compensate those who settle in our territory. We must be prepared to offer the most liberal land laws in the tropics, and the most liberal and enlightened administration. These advantages, combined with a splendid soil, equal and in some cases superior to that possessed by any of our neighbours, except Java, and a heavy and well-distributed rainfall, constitute our claims on those who contemplate entering into tropical agricultural pursuits, while there is always a possibility of preference being accorded to those products that are not and cannot be successfully cultivated in Australia.

**CHAPTER XII.**

**Our Policy Towards the Natives.**

Safeguards we should Adopt—Native Labour Supply—Native Prison Labour—The Education of the Natives—Coconut Planting by Natives.

Our first and most sacred duty is to protect the rights and privileges of the natives, and to use every means possible to promote their true welfare. To this end, I would recommend that the following principles should be incorporated in our general policy regarding native Government:

1. The natives should be confirmed in the possession of all the lands they at present occupy, or are likely to require, by hereditary succession as in Java.
2. The natives should not be subjected to any special taxation, at least until they possess sufficient assets to meet the impost without entailing hardship. Any departure from this principle would inevitably result in forced labour for the benefit of their employers. They at present pay at least two-thirds of the general taxation.

3. The natives should be directed to plant coconuts and other edible crops entirely for their own use and the use of their children. An ordinance enacted by Sir William McGregor is already in existence to this effect, although it has not been generally enforced since he left.

4. The natives should be directed to keep open the paths between their villages. This is also the subject of an existing ordinance, although it is not always enforced.

5. The natives should not be allowed to receive advances or to borrow money unless the consent of the Government is obtained in each case, nor should they be allowed to pledge their labour, their land, or their chattels, for any purpose whatsoever unless under Government sanction. This matter forms the subject of legislation in certain British Possessions in the Pacific.

6. Every planter should be required to keep a medicine chest supplied with simple remedies for the most prevalent complaints of the natives. The indentured labourers should be regularly inspected by the local magistrate or assistant magistrate, and an inquiry held if there are any complaints of ill-treatment or neglect. It should also be insisted that their huts are rain-proof and erected in a healthy position, and that the floor is raised some feet from the ground.

LABOUR SUPPLY.

As I have elsewhere stated, the importance of a good labour supply is second only to that of soil and climate, and is one of the three indispensable factors in successful tropical development.

The natives in many portions of the tropical belt are slothful and shiftless, or their energies are of such a fitful nature that continuous effort is difficult of attainment.

The policy of the British Government in such cases is to indenture more virile and energetic coolie labour from other parts—principally from India and China. This policy, while excellent from a developmental standpoint, tends to injure the native races by accentuating their listlessness, destroying their distinctive race characteristics, and introducing diseases. The Dutch, on the other hand, have not encouraged the intrusion of coloured aliens, but have created an efficient labour supply from the local material by certain legislative enactments such as the forced culture system and the corvée, by which compulsory labour was exacted, either with or without payment, in lieu of certain taxation that had been remitted.

Fortunately, the Papuan races, especially in the eastern portion of the Possession, have shown that they will voluntarily undertake continuous, and often arduous, work.

This is evidenced by the fact that already some 4,000 indentured natives are working satisfactorily in our Dependance.

They are principally engaged in mining operations and portage work—two of the most arduous and uncongenial employments to which natives of this character could be put.

The carrying of loads, 40 pounds in weight, long distances to the goldfields, in the interior of the mainland, is especially irksome and distasteful to the Papuan. This latter employment can be largely obviated by cutting bridle tracks and substituting pack unisels, a system that I have long advocated.

It is evident, therefore, that if large numbers of natives in the past have been found to voluntarily undertake such tasks, they will much more readily accept service for plantation work, as they are accustomed to agricultural pursuits, and prefer clearing scrub and planting to any other work.

The general statement that all natives in the tropics are indolent, except where the congested state of the population has necessitated continuous labour from generation to generation, requires qualification in many instances.

The kanakas in the South Sea Islands all come from the tropics, and yet large numbers of them have voluntarily accepted employment in Queensland and elsewhere, and have proved themselves industrious workers.
The labour supply for the German possessions in the Pacific is drawn almost exclusively from New Guinea and the Pacific Islands within the tropics, and yet I have heard no complaint of their inefficiency. In the Solomon Islands the labour supply is recruited locally, and the steady development of the industries alone proves that no labour difficulty exists.

We are warranted, therefore, in believing that the local labour supply in Papua will respond to all requirements. If the logic of events should prove this surmise to be incorrect, and it is decided to go further afield for indentured labour, then the area of selection should be strictly limited to the Pacific Islands, whose inhabitants can claim some blood affinity to the Papuans, and whose advent would be less injurious to the natives than the intrusion of any other coloured race.

Native Prison Labour.

The question of employment of prison labour in the Government plantations, experimental stations and nurseries is a reform that would be of distinct benefit to the natives, and of great assistance to the Government in carrying out these necessary undertakings without a large expenditure of revenue.

The native prisoners must be made to work, otherwise imprisonment instead of being a punishment would be looked upon as a luxury. The only question, therefore, is whether their labour shall be of value to the Government, or whether a great deal of it shall be valueless.

There are generally in the various prisons of Papua some two or three hundred natives. Instead of these being employed in necessary and reproductive work many of them are occupied in cutting cane grass with a sheath knife, and in other vocations that are unnecessary, or which could be performed much better by other methods. If their energies were directed into useful and productive channels a valuable and inexpensive labour force would be available to overcome those initial difficulties which private enterprise is powerless to accomplish.

No work is more suited to the native than plantation employment, as the great majority of them were agriculturists before the advent of the white man. But besides this being suitable work from an industrial standpoint, it is valuable as an educational factor. The prisoners are taught how to grow various food supplies, and acquire a taste and liking for those particular products. When they are gradually drafted back to their various villages certain useful food plants should be given to them to cultivate, and in this way the cultivation of valuable products would be disseminated in the various villages.

NATIVE EDUCATION.

This leads me to the larger question of native education. The finances would not admit of anything like the establishment of State schools, and this class of education can be well left in the hands of the missionaries. I am strongly of opinion that industrial education is more beneficial to the Papuans (who are in a comparatively primitive stage of evolution) than a knowledge of the three "r's." At the same time I do not wish to disparage in any way the valuable work that is being accomplished by the missionaries, many of whom combine industrial with scholastic education.

The most dangerous symptom in the life of the Papuan native is his ever increasing lethargy, which unless checked will lead to mental and physical deterioration. A native, who has obtained a school education is less inclined to manual work than his unsophisticated brother; he is inclined to class himself with the white man, and as the latter never undertakes manual work, such as is done by the natives, the tendency is for the educated native to look down on this class of labour.

This tendency is by no means confined to Papua, but is the almost invariable rule throughout the tropics. A strenuous effort is now being made in Ceylon and the West Indies to educate the native children in agricultural industries, by a system of School Gardens and Nature-study lessons, organized under the Department of Public Instruction. The object sought to be attained is the diversification of Agricultural Industries in the native villages, and to this end small experimental gardens are also established in the principal native settlements. While the authorities in Papua would be unable to enter systematically into this system of education at present, I am confident the missionaries would readily assist in this good work if seeds and young plants were supplied to them from the Government Nurseries.
In Java, natives who are educated for official positions are encouraged to undertake a two years' course at the Agricultural College, so that they may be enabled to instruct their countrymen in the proper methods of husbandry.

The Director of Agriculture for the Netherlands East Indies told me that he hoped to be able to establish an experimental Garden at Mereuke, on the south coast of Dutch New Guinea, near our border, not so much for the purpose of creating plantation industries as to teach the natives how to grow valuable food supplies.

### COCONUT PLANTING BY NATIVES.

One of the most difficult problems confronting tropical administration is to induce a slothful native population to engage in useful labour without compelling them to work for the benefit of others, either with or without payment.

This problem was partially solved by Sir William McGregor, twelve years ago, when he adopted in a modified form the forced culture system, with this important difference, that, while the natives were directed to plant coconut trees, both the plantation and the products thereof were to be absolutely the property of the Papuans and their posterity, instead of being, as in the Dutch system, largely the property of the Government.

The system would have entailed no hardship on the native, and its advantages are threefold. (1) It would have provided the coastal natives with an adequate food supply, and thus have protected them against those periodic famines to which they are now liable. (2) The light work entailed in this cultivation would have prevented the natives from sinking into that state of sloth and lethargy that each annual report from Papua deplores. (3) It would have enabled them to sell the surplus product, and thus provide themselves with certain necessities and comforts that would have improved their condition of life. Sir William McGregor left Papua three years after this regulation came into force, and, unfortunately, it has never been enforced by succeeding Administrators, except in one magisterial district, during the last eighteen months. Had this wise and useful regulation been enforced, the coasts of Papua would now have been waving with coconut palms, and the natives would have benefited in every way, while the export of native grown copra would have assumed large dimensions as in the Solomon Islands. This regulation should again be put into general operation all along the coasts, and the provision should be amplified by the addition of other useful food plants, especially in the interior where coconuts cannot be successfully cultivated.

Another regulation instituted by Sir William McGregor directed the natives to keep open the tracks between their villages. This would have provided another light employment for them, and would have been of advantage in creating greater community of interests, and promoting more friendly relations between the neighbouring tribes, while it would have rendered the country more accessible to the white man, and enabled law and order to be more easily maintained.
APPENDIX.

BIBLIOGRAPHY.

A library of technical books dealing with plant industries is absolutely essential for the scientific direction of tropical agriculture. It is even more necessary when the scene of operation (as in Papua) is isolated, and precludes access to large public libraries. Without such a library the settlers are groping in the dark, cut off from all knowledge of the results of the immense amount of research and experiment that is being carried out in all parts of the world regarding plantation industries and the preparation of the products. Dr. Willie, the Director of the Royal Botanical Gardens of Ceylon, writing of the Agricultural Department of the Malay States says:—"The library is one of the most important items in the equipment of such a Department, however small. When the Department is in full working order probably £200 per annum will be none too much to allow for it, as there are many scores of technical and agricultural journals which must be taken in, besides many new books, and a vast quantity of back numbers of important journals—standard works, and so on."

Mr. Carruthers, F.L.S., the Director of Agriculture and Government Botanist of the Federated Malay States, in supplying me with the following list of books specially suitable for tropical agricultural and botanical libraries, writes:—"I am forming an Agricultural and Botanical Library here and, with my private library, which is incorporated, have now some 1,500 to 2,000 works. I hope to increase it largely this year."

List of standard works necessary in connection with the development of Tropical Agriculture:—

Diseases of Plants, Tuber, translated by Smith. Longmans, 1897.
(The text is in German, but the pictures tell their own story.)

JOURNALS.

"Tropical Agriculturist" and all the American Agricultural Departmental publications and text books. "The Agricultural Journal of India" (Thacker, Spink and Co., Calcutta,) and all their publications. Some of the best works on tropical agriculture in Mr. Carruthers' library are in German—these I have not included.

Mr. H. N. Ridley, M.A., F.L.S., Director of the Botanical Gardens of the Straits Settlements also supplied me with a list of necessary books and periodicals:—

"The Agricultural Bulletin" of the States, monthly, 8s. 2d. per annum. H. N. Ridley, Singapore.
"Tropical Agriculturist," Calcutta, 22 a year.
Various agricultural bulletins published in the West Indies. These can be obtained from Sir Daniel Morris, High Commissioner for the West Indies, Barbados. The Queensland "Agricultural Journal." "Pearson's India Rubber World," weekly, 122 Liberty street, New York; best journal published on this subject.

The Philippine "Journal of Agriculture." Agricultural Department, Manila.
"The Agricultural Journal of India," Agricultural Research Institute, Pusa, Bengal.
"Wat's Dictionary of Economic Products of India," Indian Museum, Calcutta. This treats of all agricultural plants in the tropics.
GENERAL INDEX.

(A note—F.M.S. is an abbreviation for Federated Malay States.)

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