mention must be made of Codrington College in Barbados, which is the only institution in the West Indies where an English university degree can be obtained. This unique institution was founded by Christopher Codrington, governor-general of the Leeward Islands, who died in 1710 and bequeathed his two sugar estates, ' Consett's ' and ' Codrington's ' (now ' College ' and ' Society '), which consisted of 763 acres, three windmills and a sugar factory, 315 negroes and 100 head of cattle, to the Society for the Propagation of the Gospel, in trust, for the maintenance of a convenient number of professors and scholars, ' all of them to be under the vows of poverty, chastity, and obedience; who shall be obliged to study and practise Physic and Chirurgery, as well as Divinity; that by the apparent usefulness of the former to all mankind, they may both endear themselves to the people and have the better opportunities of doing good to men's souls, whilst they are taking care of their bodies.' The college was opened as a grammar school in 1745, but was not based on a proper academic footing until 1834, when Bishop Coleridge interested himself in the foundation. Until 1875 the college conferred its own testamurs; but in that year, through the exertions of Bishop Mitchinson, then Bishop of Barbados, and the visitor of the college, it was affiliated to Durham University.

Codrington College, Barbados.

It was not until the latter part of last century, when the islands may be said to have recovered to a great extent from the effects of the abolition of slavery, that the question of primary education was taken up by the several governments, and that departments of education were formed. The policy generally followed was to give grants where denominational schools already existed and to establish additional undenominational schools where necessary under direct government supervision.

Primary education.

In Barbados the primary schools are all denominational, the bulk of them being under the control of the Church of England. As regards the higher grade schools, Harrison College, the Lodge, and the Combermere are the principal boys' schools receiving government aid, while

Barbados.

Queen's College and the Alexandra School for Girls fall under the same category.

Jamaica. In Jamaica the 700 or more primary schools are entirely official; government scholarships to the extent of £600 are given, while the island has the advantage of having been selected by the trustees under the will of Cecil Rhodes to participate in the munificent scholarship scheme instituted by that statesman. Every year a Rhodes Scholar is selected by a committee consisting of the governor, the chief justice, the inspector of schools, the chairman of the Schools Commission, and a fifth member elected by co-optation. In two years out of three the competition is open to Jamaica boys whether educated in the island or abroad; but in the third year it is confined to boys educated in the island.

Trinidad. Of the Trinidad primary schools, four-fifths are denominational and receive grants, the remaining fifth being under government control. In addition there are special training schools for teachers. Representing the higher education, there are the Queen's Royal College and the Roman Catholic St. Mary's College in Port of Spain, while the Presbyterians are represented by the Naparima College affiliated to the first-named institution. A sum of £650 a year is granted by the government in scholarships, while there are several convent schools, together with a high school for girls.

Other islands. Of the 46 primary schools in Grenada, 9 are provided by the government. At the suppression of the Mico Trust superintendence of schools in St. Lucia, in 1891, three of them were taken over by the government and the others handed over to the Roman Catholic body. In St. Vincent the primary schools are under the entire control of the government, by which a high school for girls is also supported.

With the exception of Dominica, the primary schools in the Leeward Islands are entirely controlled by the religious bodies, with the assistance of grants from the government. Various secondary schools receive grants, and in Antigua there is a primary school at St. John's.

In Dominica a special agricultural state-aided school exists.

In the Bahamas there is a government system of elementary education which was established in 1847. There are now 48 unsectarian government schools, 19 aided schools, and 37 denominational schools. Higher education is provided for by the Nassau Grammar School, Queen's College, and St. Hilda's School.

In recent years, since the establishment of the Imperial Department of Agriculture through the foresight of Mr. Chamberlain in 1898, much has been done in the direction of agricultural training in the primary schools, practical illustrations with the aid of school gardens being carried out when practicable.

Religion.

Every well-known religion of the world is represented in the British West Indies, a circumstance which is due to the cosmopolitan character of the population of the islands as a whole.

In many parts, notably in Jamaica, the Jewish religion is strongly represented. In the islands which came to us from the French most of the inhabitants are Roman Catholics, while in Barbados and the islands settled by the English the principal religion is that of the Church of England. The Wesleyan and Moravian Churches have also large followings, and so, too, has the Baptist Church. The introduction of East Indians has brought in its train Muhammadanism and Buddhism.

The early settlers from the mother country were accompanied by their own chaplains and divines. In 1630 a Church of England divine was a member of the governor's council in St. Kitts, and as early as 1629 Barbados was divided into six parishes; six churches, besides chapels, being built shortly afterwards in the island. Colonists at that time were obliged to conform to the charge and rules of the Church of England, and the practice of the church as regards maintenance of the Sabbath, family prayers, and general conduct was strictly enforced. It is recorded, however, that even at that period Anabaptists, Jews, and Quakers existed in the island. At the present

time the Church of England is the official church of Barbados, its clergy being on the civil list of the island.

In Jamaica some of the chaplains of our troops which took possession of the island in 1655 remained with the garrison and settled there, forming the nucleus of the local church. In 1662 the Church of England was duly established in the island, and remained so until 1870, when gradually disendowment was set in motion. The Church of England is now no longer established in Jamaica, but is self-supporting.

Anglican bishoprics.

At the present moment the Church of England in the West Indies is divided into four bishoprics, those of Jamaica, Barbados, Trinidad, and Antigua (the Leeward Islands). The see of Barbados includes the Windward Islands (Grenada, St. Vincent, and St. Lucia), while Turks and Caicos Islands and the Grand Caymans are included in the diocese of Jamaica. The Bishop of Jamaica is also Primate of the West Indies. The Church of England was disendowed in St. Vincent and Grenada in 1889.

Roman Catholics.

The Roman Catholic religion is strongly represented in the West Indies. In fact, in Dominica, Grenada, St. Lucia, and Trinidad the bulk of the Christian population belong to this faith. A Roman Catholic bishop resides in Dominica and an archbishop resides in Trinidad. The religious order to which the West Indian islands is assigned is that of the Dominicans.

Nonconformists.

Of the Nonconformists, the Moravians were the first in the West Indies, their missionaries arriving in the middle of the eighteenth century. The Wesleyans commenced their propaganda in Antigua in 1789, as the outcome of Mr. Gilbert, the Speaker of the Assembly, meeting John Wesley himself, while the Baptists owe their position to American emigration at the time of the American Revolution.

As already mentioned, East Indian immigration brought in its wake Buddhism and Muhammadanism, which are especially apparent in Trinidad, and priests of those persuasions have been among the immigrants.

Speaking of the West Indies as a whole, there may be

said to be a strong religious feeling throughout, whatever the sect to which the people belong. This state of affairs is deservedly encouraged by the various governments, who recognize the great value of the practice of religion as a means to the preservation of order.

Constitutions.

It is a common error to classify the British West Indies as Crown colonies. It is true that the majority of them do fall under that category, but Barbados and the Bahamas possess representative institutions, while in British Guiana the constitution of the legislative council does not provide for an official majority. None of the colonies, however, possesses responsible government, and in all the administration is carried on by public officers under the control of the Secretary of State for the Colonies. Officially the islands are classified as follows :

1. Colonies possessing an elected house of assembly and a nominated legislative council :—the Bahamas and Barbados.

2. Colony possessing a partly elected legislative council the constitution of which does not provide for an official majority :—British Guiana.

3. Colonies possessing a partly elected legislative council the constitution of which provides for an official majority :—Jamaica and Leeward Islands.

4. Colonies possessing a legislative council nominated by the Crown :—British Honduras, Grenada, St. Lucia, St. Vincent, and Trinidad and Tobago.

The question of federation.

It is this remarkable lack of uniformity in the constitutions of the several West Indian colonies which proves one of the most serious obstacles in the way of the federation of the islands. The inhabitants in the Bahamas and Barbados are justly proud of the representative institutions which, in the island last named, the people have enjoyed for over two centuries and a half, and they would be most unwilling to surrender their constitution. To have any real voice in the councils of the Empire the Federated West Indies would have to be given self-government, and there are few who would venture to say that the present political state of the

islands would justify the grant to the West Indies, as a whole, of representative institutions.

Constitution of Barbados.

The constitution of Barbados was first granted by King Charles I, in 1627, and confirmed by the Commonwealth in the Articles of Agreement for the surrender of the island which have been called the Charter of Barbados. The government consists of a nominated legislative council of nine members, and a house of assembly consisting of twenty-four members elected annually by the people on the basis of a moderate franchise. At general elections to the latter body there is frequently no contest, a fact which speaks volumes for the contented state of the inhabitants, who prefer to devote their time to the development of the island rather than to political strife, an example which might with advantage be followed elsewhere. Next to the house of commons and the house of assembly in Bermuda, the Barbados house of assembly is the most ancient legislative body in British oversea dominions. The executive functions of the government are performed by an executive council which consists of the governor, the colonial secretary, and the attorney general *ex officio*, and such other persons as may be nominated by the King, and of an executive committee which consists of the members of the executive council, one member of the legislative council, and four members of the house of assembly nominated by the governor. This executive committee introduces all money votes and government measures and prepares the estimates.

Constitution of the Bahamas.

The constitution of the Bahamas is very similar to that of Barbados. By an Order in Council dated July 25, 1728, a general assembly with legislative powers was constituted. This assembly met for the first time on September 29, 1729. There is now an executive council consisting of the governor, the colonial secretary, the attorney-general and receiver-general as *ex officio* members and five official or unofficial members. Every member, other than an *ex officio* member, must vacate his seat after five years, but may be reappointed. The legislative council consists generally of nine members, nominated by

the governor and confirmed by the Crown. The house of assembly consists of 29 members elected for seven years on a most liberal franchise which amounts practically to manhood suffrage, there being in 1911 no fewer than 13,768 voters on the electoral roll.

Constitution of Trinidad.

Trinidad, which was acquired by conquest in 1797 from Spain, is an example of a pure Crown colony. The government is administered by a governor assisted by an executive council of five members. The legislative body is the legislative council of Trinidad and Tobago, which was re-constituted in 1898, and now comprises the governor, colonial secretary, attorney-general, solicitor-general, auditor-general, inspector-general of constabulary, director of public works, surgeon-general, protector of immigrants, receiver-general, collector of customs, and of such unofficial members as the government may appoint. These unofficial members hold their seats for five years and are eleven in number.

Tobago, which, like all the other West Indian colonies with the exception of Trinidad, used to have representative institutions, has since 1899 been administered as a ward of Trinidad.

The Windward Islands.

Grenada, St. Vincent, and St. Lucia are united in one government for certain purposes under the title of the Windward Islands. As early as 1764 there was one governor for the Southern Caribbee Islands of Grenada, Dominica, St. Vincent, and Tobago. In 1833 St. Vincent was brought with Barbados, Grenada, and Tobago under one government with head-quarters at Barbados, and in 1838 St. Lucia was included. Then in 1885 letters-patent were passed constituting the government of the Windward Islands, omitting Barbados, while Tobago was subsequently united with Trinidad. Grenada and St. Vincent both had at one time their elected houses of assembly, but they passed resolutions abdicating themselves and leaving the remodelling of the constitution in the hands of the Crown, which adopted the Crown colony system. St. Lucia, originally governed by French laws and systems, is now also a Crown colony.

Each island of the Windward Islands colony still retains its own institutions and there are no common legislature, common laws, revenue, or tariff, and the few institutions which the islands have in common are a court of appeal and a common audit system.

The Leeward Islands.

The Leeward Islands form a far closer federation. This colony came into being by virtue of the Leeward Islands Act, in 1871, and the federal council as reconstituted in 1899 consists of eight official and eight elective members. Three elective members are chosen by the unofficial members of the legislative council of Antigua, two by those of the legislative council of Dominica, and three by those of the legislative council of St. Kitts and Nevis. They must be and continue members of their respective island councils. The official members are the governor, the colonial secretary, the attorney-general, the auditor-general, the administrators of St. Kitts-Nevis, and Dominica, and the commissioners of Montserrat and the Virgin Islands.

The legislative council has concurrent legislative powers with the local legislatures on certain subjects specified in the Act, such as matters of property, mercantile and criminal law, the law relating to status, the maintenance of a general police force and a common convict establishment, quarantine, postal and telegraph affairs, currency, audit, weights and measures, education and the care of lunatics, all matters relating to immigration, copyright and patents, and its own constitution and procedure. Any island legislature is competent, in addition, to declare other matters to be within the competency of the general legislature. Any island enactment on such subjects is void if repugnant to an enactment of the general legislature, or may at any time be repealed or altered by one.

Jamaica.

The constitution of Jamaica may be described as a modified Crown colony system, the people enjoying to some extent direct representation. The original constitution granted by Charles II in 1662 was a representative one consisting of a governor, a privy council and legis-

lative council, and an assembly of forty-seven members; but the depression caused by the abolition of slavery led to a series of grave constitutional crises, the assembly refusing time after time to vote supplies. In 1839 Lord Melbourne's government introduced a Bill into Parliament for a suspension of the constitution, but it was defeated, and it was not until 1854 that harmony was temporarily restored by certain changes which were made after the Morant Bay rebellion in 1865. Governor Eyre urged a change in the constitution and the legislature willingly responded, and in 1866 surrendered the constitution which the island had enjoyed for over two hundred years. A legislative council was then formed by an Order in Council of 1866 and 1869 consisting of such official and unofficial members as Her Majesty might think fit, the numbers of which were six until 1878, when they were enlarged to eight, a ninth being added in 1881.

By an Order in Council dated May 19, 1884, and amended in October 1895, a legislative council was constituted, consisting of the governor and five *ex officio* members, and of such other persons, not exceeding ten in number, as the Crown might from time to time appoint, or as the governor from time to time might provisionally appoint, and fourteen persons to be elected. A privy council, with the usual powers and functions of an executive council, was also provided for. The Order in Council laid it down, however, that the votes of the nominated members were not to be recorded against the unanimous votes of all the fourteen elected members on any question, unless the governor declared that, in his opinion, the decision of such question in a sense contrary to the votes of the elected members was 'of paramount importance to the public interest'.

The full number of nominated members was not at first appointed, but in 1899, consequent upon the refusal of the legislature to pass a tariff Bill, Sir Augustus Hemming, the then governor, acting on the instructions of Mr. Chamberlain, completed the full number of nominated members by the addition of four. These four

members were subsequently withdrawn, but in the following year they were reappointed, and since then the official members have been in a majority, the functions of the elected members being reduced to a purely advisory basis.

§ 2. *British Honduras*

Topography.

The colony of British Honduras is situated on the mainland of Central America, on what is termed the Mosquito Coast. It lies between 18° 29′ and 15° 54′ N. lat. and 89° 15′ and 87° 50′ W. long., and is 300 miles from Jamaica. It is bounded on the north by Mexico, from which it is separated by the Hondo River, and on the west and south by Guatemala. Its area is 8,598 square miles, or only slightly less than that of the whole of the British West Indian islands put together.

The character of the country is similar to that of most of the coast lands of Central America. The front lands are low and swampy, and the country rises gradually until the high lands are reached at the back of the colony.

The soils of the colony are described as the Cohune ridge, which comprises the alluvial deposits along the river valleys, the pine ridge—long sandy tracts covered with pines, scrub, and grass and the broken ridge which is intermediate between the two. The country is thickly wooded, and produces fine timber, notably mahogany and logwood. There are several important rivers, the chief of which are the Belize River, at the mouth of which the capital is situated, the New River, the Hondo River, and the Sibun. The Belize runs from the west boundary of the colony eastward a distance of about 150 miles, and beyond 30 miles from the mouth navigation is interfered with by rapids. The Hondo and New rivers are navigable for a greater distance, craft drawing 4 feet or thereabouts being able to go up them for about 60 miles.

Population.

The original inhabitants of British Honduras were Indians who were called Mosquito Indians from the name of the coast.

In 1638 adventurers were attracted to the country by

the fine timber on the banks of the Hondo and other rivers and made their quarters at St. George's Cay, where they settled with their slaves, who formed the nucleus of the present negro population. Caribs from St. Vincent were deported in 1796 to the island of Ruatan off Honduras, but no pure-blooded survivors of them remain.

The population of the colony at the present time is exceedingly sparse, being 40,458 only, or 4·7 souls to the square mile. This state of affairs is no doubt due to the fact that by the agreement made between Spain—for the territory was recognized as being Spanish—and the original settlers agriculture was prohibited for over 160 years, timber-cutting only being permitted. The population includes 400 Europeans, 200 white Americans, and 2,000 persons of European descent.

Education and religion

The schools of British Honduras, both secondary and primary, are, with few exceptions, denominational. Nearly all the primary schools are aided by the colonial government. The dominating religion in British Honduras is that of the Church of England. The colony was originally part of the see of Jamaica, but in 1883 it was formed into a separate bishopric. Other denominations include those of the Roman Catholics, the Free Church of Scotland, the Wesleyan Methodists, and the Baptists. No church in the colony is established and none receives any grants from the government.

Constitution.

When the home government first recognized the settlement of British Honduras they appointed a superintendent to manage its affairs, and it was not until 1839 that it received the assistance of an executive council. In 1853 a legislative assembly was formed, consisting of eighteen elected and three nominated members, and on May 12, 1862, the settlement was declared a colony and a lieutenant-governor was appointed subordinate to the governor of Jamaica. In 1870 the legislative assembly was abolished by local enactment and a legislative council was substituted for it, consisting of five official and not fewer than four unofficial members, with the lieutenant-governor as president. The council now consists of three official

and five unofficial members. The executive council comprises the governor and six members three of whom sit *ex officio*, the other three being nominated.

§ 3. *British Guiana*

Topography.

The great colony of British Guiana, though situated on the mainland of South America, has so many interests in common with the West Indian islands, that it is generally considered an integral part of the British West Indies. It has a coast-line of about 250 miles in length on the Caribbean Sea, and is bounded by Venezuela on the east, by Surinam or Dutch Guiana on the west, and by Brazil on the south. The area of the colony is about 90,277 square miles, and extends from 9° to 1° N. lat., and from 57° to 61° W. long.; but only about 130 square miles of it are at present under cultivation. The inhabited portions of the colony consist of the alluvial flat land extending along the sea coast from mid-water mark to a distance of about 10 miles inland, and along the banks of the rivers for a considerable distance from their mouths. The chief of these rivers are the Demerara, the Essequibo (with its principal tributaries the Mazaruni, the Cuyuni, the Potaro, and the Rupununi), and the Berbice, which give their names to the three counties into which British Guiana is divided, and the Corantyne, which separates the colony from Dutch Guiana.

The 'front lands', as the alluvial flat is called, are below the level of the sea, which is kept out at high tide by an elaborate and costly system of sea defences established during Dutch occupancy.

Forest land.

Beyond the alluvial coast-lands is a great belt of 150 miles in depth, gradually rising from the low level of the coast till it culminates in an elevated and hilly land averaging from 1,500 to 2,000 feet in height, where the forest is succeeded by well-watered savannahs, or treeless plains, which extend for many miles into Brazil and Venezuela. Close to and parallel with the coast are a number of sandy reefs which are believed to have been left successively by the receding sea.

Rivers. Of the above-mentioned rivers, the largest and most important is the Essequibo, which rises in the Acarai Mountains in the extreme south and flows in a northerly direction, receiving the waters of many tributaries on its way to the sea. In one of these—the Potaro—occurs the most notable of the many waterfalls in the colony, namely, the world-famous Kaieteur, or Old Man's Fall, which was first discovered by Mr. Barrington Brown, of the Geological Survey, in 1870. The Potaro here precipitates itself over a sandstone and conglomerate table-land into the deep valley below. The Kaieteur is five times as high as Niagara, and it is claimed that it represents a far greater horse-power than that of the North American fall.

Although it is 620 miles long, the Essequibo River is only navigable by vessels of any size for a distance of 50 miles from its mouth, owing to rapids and cataracts along its course. The Demerara River, on the other hand, which has a length of 200 miles, offers a safe passage for ships for a distance of nearly 70 miles. The Corantyne, which is 600 miles long, is also much broken by cataracts, but the Berbice is accessible for a distance of 175 miles or more from the sea. About 100 miles from the mouth of this river was situated the old Dutch capital of Berbice, Fort Nassau.

Mountains. British Guiana has several mountain ranges, of which the Pakaraima, in the west of the colony, is the most important. It is in this range that the highest mountain, Mount Roraima, which rises to a height of 8,740 feet, is situated. Roraima is remarkable for its conformation, having extremely precipitous sides and a flat water-worn summit of upwards of 15 square miles in extent, in which the boundaries of Guiana, Venezuela, and Brazil meet. It was first ascended by Sir Everard im Thurn in 1889, but has rarely been visited since.

Scenery. The scenery of the front lands of British Guiana, which are below the level of the sea, is not without charm. Georgetown, the capital, is a scrupulously clean city laid out on a rectangular plan, and boasts many

noble examples of colonial architecture. The buildings, both private and public, are constructed of wood, and it is surprising how picturesque many of them are with their gay gardens and handsome trees. Many of the streets have drainage trenches and canals on which the superb Victoria Regia lily flourishes; but the tendency has been to fill in the canals in recent years. New Amsterdam, at the mouth of the Berbice River, is also a pleasing town in this tropical Holland.

In the interior of the colony, the scenery is particularly grand. Rapids, cataracts, and water-falls, mountains romantic in outline and formation, dense forests, gorgeous tropical vegetation, and rolling grassy plains are its chief characteristics.

Population: aborigines.

The aborigines of British Guiana are Indians, of whom there were many varieties. They, however, belonged to four distinct tribes, each speaking an entirely different language, namely: (1) the Warraus, (2) the Arawaks, (3) the Caribs, and (4) the Wapisianas. The first named are now called the Swamp Indians, living as they do in the low-lying coast-lands of the north-west of the colony. The Arawaks live in the higher lands and are more civilized than any of the other tribes. The Caribs may be subdivided into the true Caribs, the Arecunas, the Akawois, and the Macusis, and of these the true Caribs still maintain their traditional fighting instinct. The Wapisianas are mostly traders in the southernmost parts of the hinterland.

Immigrant population.

The European population of the colony comprises colonists from the mother country and their descendants, and families of Dutch descent. Immigration from Madeira soon after the abolition of slavery is responsible for the large number of Portuguese in the colony. As elsewhere in the West Indies, the abolition of slavery had a disastrous effect on the labour supply. The freed negroes declined to work, and formed themselves into village communities. To supply the labour market immigrants were introduced from Madeira, Malta, Germany, and the United States, and in 1853, 647 Chinese

were introduced, to be followed by some 12,000 more between 1859 and 1867. But European immigration proved a failure, and Chinese immigration was discontinued in 1867, owing to the attitude adopted by the Chinese government with regard to returning immigrants.

Meanwhile an experiment had been successfully made in 1838 in the direction of immigration from India. At first some trouble arose through the uncertainty of the East Indians finding work on their arrival, and many wandered about the colony and died. The immigration system lacked organization at the outset, but all difficulties were eventually overcome by the establishment of the principle of indenture, and in 1845 the introduction of labourers from the East Indies to British Guiana under indenture and subject to the control of the Home and Indian governments was started. With the exception of the years 1849–51, it has continued ever since.

The main features of the system are that the East Indians are recruited by emigration agencies at Calcutta and are conveyed in steamers to British Guiana, where they serve their employers for five years at a wage of 1*s.* 1½*d.* per day for able-bodied adults, and 8*d.* per day for those who do not fall under this category. All who arrived in the colony before August 5, 1898, are entitled to a return passage to India on payment of a quarter of the passage-money in the case of males, and one-sixth in the case of females. With regard to the others, the immigrants, after ten years' residence in the colony, are entitled to their return passage to India on payment of half the fare in the case of males and one-third in that of females, the balance being paid by the planter. But most of the Indians are so well-to-do in British Guiana that a comparatively small proportion avail themselves of the return passage, the majority remaining in the colony, where they form most valuable members of the community.

The system of immigration has been the subject of many official inquiries, from every one of which it has emerged triumphant. Surgeon-Major D. W. D. Comins, who was sent by the Indian government to the West Indies to

report on the system, declared in 1893 that 'as regards the general arrangements made for Indian immigrants, I have nothing but admiration to express. The system has passed through successive stages of improvement, until it now stands a pattern to all the world of successful and liberal management.' Again, the committee which sat as recently as 1910 under the chairmanship of Lord Sanderson showed that Indian immigration was not only of the greatest assistance in developing the resources of some of our tropical colonies and increasing their prosperity, but that in the present condition of India, indentured emigration was the only practical form of emigration to distant colonies on any considerable scale. They also showed that Indian emigration was of benefit to the East Indians themselves.

The census of the colony taken in 1911 showed the population to be 296,041, of which no fewer than 126,166 were East Indians, while 114,718 were blacks. Portuguese number 10,044, Chinese 2,619, and Europeans other than Portuguese 3,933. The great need of British Guiana is population. It is deplorable that it should only stand at 3·3 souls per square mile; and those who have the welfare of the colony at heart or who have studied the question are convinced that the system of East Indian immigration, which has proved of such immense advantage not only to the colony but also to the immigrants themselves, should be encouraged in every possible manner.

Education.

Primary education in British Guiana is denominational, but the schools are state-aided to a very considerable extent. Education is made compulsory for all children up to the age of 12, or for those who have not passed the prescribed fourth standard. The primary education code is based on the system of grants-in-aid for each child who passes in writing, arithmetic, and sewing. In all other subjects such as geography, garden work, elementary hygiene, natural knowledge, singing, and drilling, the school is examined once a year by the inspector and classified according to results. The grants vary between

1*s.* 0½*d.* and 4*s.* 4½*d.*, and there is also an attendance grant of 12*s.* 6*d.* for every 30 children presented for examination. The expenditure on grants-of-aid during the year is about £30,000, which is distributed among 221 schools with an average attendance of over 20,000. British Guiana being essentially an agricultural country, agricultural education is not overlooked. There is a system of model gardens in various districts under the direction and control of the director of science and agriculture, and a number of primary schools have gardens attached to them.

Secondary education is provided for in the case of girls mainly by private enterprise, and in that of boys by Queen's College, which is maintained by the government, and by two or three private schools. A Guiana scholarship, of the value of £200 and extending over 3, 4, or 5 years, is awarded every year on the result of an examination by the Cambridge local authorities.

Religion.

Until 1879 both the Scottish and English churches were officially recognized, the clergy ranking as government officials, while grants were also made to the Roman Catholic and Nonconformist bodies. The rectories and parsonages of the Scottish and English churches were also maintained by the government. This curious double establishment was due to the fact that in some districts the Scottish predominated and in others the English, the various parishes being thus attended to by the Scottish or English church according to the tenets of the respective inhabitants.

In 1899, however, it was decided to disestablish the church, and to put the Scottish and the English churches on the same footing as the other denominations. To this end, whenever a vacancy occurs among the clergy on the Civil List, a sum equivalent to 75 per cent. of the salary attached to the post is paid to the respective governing bodies, who themselves appoint a successor. It is expected that in 1919 disestablishment will be complete, and the Scottish and English churches be on the same footing as those of the other denominations.

Nonconformist bodies represented in the colony are the Wesleyan Methodists, the Moravians, the London Missionary Society, and the African Methodist Episcopal Church.

Constitution.

The original occupants of the colony were Dutch, and the constitution as it at present stands is modelled on that which the British found in operation when they took over the colony in 1803, it being part of the terms of capitulation that the laws in force at that time should be respected. The constitution then consisted of a court of policy composed of four official and four unofficial members; the former sat *ex officio*, and the latter were nominated by a body specially constituted for the purpose and called the college of keysers, the members of which were elected by the inhabitants on a certain franchise. When the budget or any money matters were concerned, the court of policy was augmented by the financial college, consisting of six members elected directly on the same franchise as the college of keysers; the joint body thus formed was called the combined court, which at this time had no power to regulate the amount but only the nature of the taxation.

As in Jamaica, under the British rule constant disputes occurred as to the authority of the Crown. While admitting the right of veto in relation to laws, it was claimed by the colonists that the combined court had absolute power in regard to the spending of money, especially as to the Civil List, which is voted every five years. In 1891, as the result of friction with and pressure from the Crown, a change was made in the constitution. The administrative powers of the court of policy were transferred to an executive council, the college of keysers was abolished, and the unofficial members of the court of policy elected by the direct vote of the people. As the constitution now stands, therefore, it consists of the governor, the executive council, composed of certain *ex officio* and unofficial members, the latter nominated by the Crown, the court of policy, consisting of the governor, seven official and eight elected members, and the combined court, composed of the court of policy and six

financial representatives directly elected. The latter body has a right, firstly, to vote the raising of money by colony taxation, and to supervise the colonial acounts ; secondly, to discuss the annual estimates ; and thirdly, to reduce or strike out any item in the estimates not in the Civil List.

§ 4. *Bermuda*

Topography.

The Bermudas, or Somers' Islands, consist of a group of some 300 islands situated in the Atlantic in 32° 15′ N. lat. and 64° 51′ W. long., and about 580 miles to the east of Cape Hatteras in North Carolina, the nearest point on the American continent, 730 miles from Halifax, Nova Scotia, and 677 miles from New York. In spite of the large number of islands, their total area is only about 19 square miles, or less than one-eighth of that of the county of Rutland.

The islands are all of coral formation and are consequently comparatively flat. Their scenery, however, is of great beauty, and their semi-tropical vegetation and delightful climate, which is largely influenced by the Gulf Stream, render them a favourite winter resort for residents on the neighbouring continent. It is claimed that nearly 30,000 tourists visit the islands every year.

The largest island, which is known as the Main Island, is about 14 miles in length and, on the average, a mile wide. In the centre of it is situated Hamilton which succeeded St. George at the east end of the island of the same name as capital in 1790. Hamilton stands at the head of a deep inlet enclosed by an encircling coral reef which renders it an admirably sheltered harbour for the small vessels which carry on the island trade.

St. George, which owes its name to Admiral Sir George Somers who colonized the Bermudas, still enjoys a considerable amount of trade, and its harbour is much frequented as a harbour of refuge.

The other islands of importance are Ireland Island, on which the government dockyard and naval establishments are situated, Boaz and Watford Islands, Somerset,

Smith's, St. David's, Cooper's, Nonsuch, Rivers, Ports and Godets, which form an almost continuous chain, connected by bridges and causeways. The islands have no rivers or streams, and as the water in the wells is brackish, the inhabitants depend entirely on the rainfall for drinking purposes.

Population.

The population of Bermuda, which numbers 18,994, is less cosmopolitan than that of the West Indian Islands.

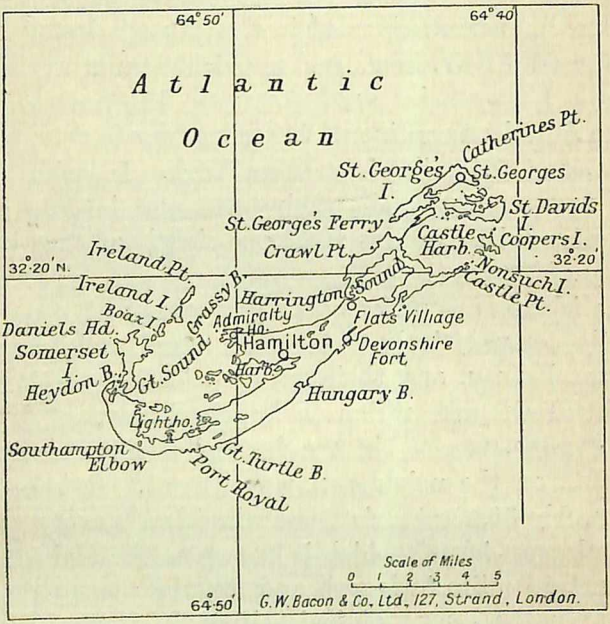

Fig. 13. Bermuda.

The blacks predominate, but there is a large pure white population in which the naval and military and official classes naturally predominate.

Education.

All the schools in Bermuda are private and charge fees for attendance, which is compulsory. The colonial legislature first granted money in aid of the elementary schools in 1839, and there are now about 27 aided schools and in addition 25 schools which are without State assistance. The central control of the aided schools is vested in a board of education, consisting of 10 members appointed by the governor under the provision of the Schools Act of 1907.

The island, like Jamaica, enjoys the advantage of nominating a Rhodes Scholar, and there is also an annual scholarship of £150 for competition among young Bermudans.

Religion.

That of the Church of England is the prevailing religion in Bermuda. The islands were at one time attached to the see of Nova Scotia, and then to that of Newfoundland, but on the formation of the synod, they were made a separate diocese in 1879. The Roman Catholic Church has also many adherents. It is attached to the see of Halifax, Nova Scotia, the archbishop of which city pays periodical visits to the islands, in addition to a Roman Catholic chaplain to the forces; and a priest is permanently stationed at Hamilton.

The Presbyterian and Wesleyan Methodist Churches also have many followers, and the Salvation Army began its work in Hamilton in 1896.

Constitution.

Bermuda enjoys representative government, which was introduced into the colony as far back at 1620, and its House of Assembly is the oldest representative body in the British Empire with the exception of the House of Commons.

Since 1684, when the charter of the Bermudan Company of London was annulled, the governors have been appointed by the Crown and the laws of the colony enacted by a legislature comprising the governor, the legislative council, and the house of assembly. The governor is assisted by an executive council, consisting at present of four official and two unofficial members. The legislative council consists of nine members, three of whom are official and six unofficial. The house of assembly consists of thirty-six members, four of whom are elected by each nine parishes.

References.

[See official reports of the various colonies, Jamaica *Gazette* and *Handbook*, Barbados *Official Gazette* and *Handbook*, Grenada *Handbook*, &c.; A. E. Aspinall, *The British West Indies*, London, 1912; J. H. Stark, *Guides to the West Indies*, London, 1898, &c.; H. de R. Walker, *The West Indies and the Empire*, London, 1901; and references cited in the following chapters.]

CHAPTER XIII

GEOLOGY, CLIMATE, VEGETATION, AND FAUNA

By Sir Daniel Morris

Geology

Form and grouping of the islands.

The West Indies present geological problems of great interest. Karl von Seebach and, later, Suess have devoted close attention to them. The islands as they now appear are the summits of a submerged mountain chain, forming the eastern boundary of the Caribbean Sea, and separating it from the Atlantic Ocean. The mountain system of the greater islands, such as Cuba, Jamaica, Haiti, and Puerto Rico, which forms a single chain in Puerto Rico and San Domingo, divides in Haiti, giving rise to a southern branch passing through the elongated peninsula of Jacmel to Jamaica and Honduras, and to a northern branch extending beyond Cuba towards Yucatan. A further range is that of the Sierra Maestra in southern Cuba, running through the Cayman group, the bank of Misteriosa, Viciosas, and Swan Island, to the depths of the Gulf of Mexico and reappearing inland. As originally suggested by von Buch and more fully elaborated by Suess, the West Indies may be divided into three natural groups : the first and innermost, confined to the Lesser Antilles, is wholly of volcanic origin—this group is composed of the islands of Saba, St. Eustatius, St. Christopher or St. Kitts, Nevis, Montserrat, the westerly half of Guadeloupe, Dominica, Martinique, St. Vincent, the Grenadines, and Grenada. These form a continuous arc with numerous eruptive centres, such as those now existing in Guadeloupe, Martinique, St. Lucia, and St. Vincent. The next group comprises the lofty and picturesque mountains of the Greater Antilles, with a narrow but well-defined extension in the Lesser Antilles. Suess regards these mountains as formed 'in complete accordance

with the type of the coast Cordilleras of the south and of the mountain ranges of Venezuela'. They are of Lower Cretaceous age; but highly fossiliferous limestone deposits of the Upper Cretaceous are also present, as in Trinidad and Venezuela. In Jamaica, as will be shown later, some of these deposits present close resemblances to certain beds in Europe. To this second group belong Cuba, including the Isle of Pines, Haiti, Puerto Rico, the Virgin Islands, St. Croix, Anguilla, St. Bartholomew, Antigua, the eastern half of Guadeloupe, and a part of Barbados. A southern arc runs through Jamaica. In the Lesser Antilles the girdle runs entirely outside the volcanic islands.

The third and outermost group is composed of mid-Tertiary rocks and even more recent deposits. There are practically no mountain ranges. The general surface is composed of low hills and modest elevations of an undulating character, with stretches of rough limestone, gravel, and sand. The group broadens towards the north-west and gradually narrows towards the south-west. It includes all the Bahamas islands, the banks of trifling heights towards the south-east as far as Natividad, then Anegada, Sombrero, Barbuda, and a part of Barbados. Suess suggests that the peninsula of Florida, and possibly the level parts of Yucatan, may prove to be outlying areas of this group.

Tectonic movements.

It follows from the preceding observations that the whole of the middle or principal group of the West Indian islands, from the western end of Cuba, through Jamaica, Haiti, and Puerto Rico to Barbados, is composed of the same class of rocks. Granite and gneiss-like rocks, conglomerates and schists, older eruptive rocks, serpentine, crystalline limestone and sandstones, which, as far as can be determined by organic remains, are all of Cretaceous age, and form the visible remnant of a once continuous mountain range. It is the same series of rocks as that found in Trinidad and the northern chain of Venezuela. In Miocene times there was a great depression of the whole Antillean region, when only a few peaks were

visible, with free communication between the Atlantic and Pacific Oceans. On the other hand, according to Hill, the most important elevatory movement was at the close of the Pliocene period, amounting to 3,000 feet, which, he claims, gave opportunity for the migration of elephas from the continent to Guadeloupe, and for the large rodents to enter the region now constituting the island of St. Martin. This was also the period when the two Americas were connected by the West Indian bridge.

Jamaica. Through the labours of Mr. J. G. Sawkins, F.G.S., and later of Mr. R. T. Hill, the geology of Jamaica is comparatively well known. The older formations are of late Cretaceous age, when the crests of the mountains began to appear above the water, and in succeeding epochs grew more and more conspicuous. It is evident that about the same period volcanic activity was in existence in the near neighbourhood. This was followed by a considerable degradation of the volcanic heaps by erosion, as shown in the vast sediments of the upper part of the Blue Mountain series, especially in the Richmond beds.

It is probable that following this, according to Hill, there was a re-elevation of the sea-bottom and the restoration of the land area to proportions far beyond its present outline, probably connecting it with the adjacent island of Haiti in the east, and the Central American region in the south and west. These movements collectively produced great oscillations, whereby, since the close of Cretaceous times, the land and sea-bottom have moved up and down, resulting in the expansion or shrinking of the respective areas in harmony with these movements. The oldest formations which compose the higher mountains and the nucleus of the island structure consist of stratified shells and conglomerates, tuffs, débris of volcanic material, and, rarely, marine fossiliferous limestones and marls, all of which have undergone great displacements and deformation. Hill divides these deposits into, (1) an upper division (Eocene), representing the Richmond beds, and (2) a lower division (Upper Cretaceous), comprising in descending

order the Minho, Ballard, Logie Green, Frankenfield, and Yallahs beds. The complex folding and consequent concealment render it impossible to determine the exact base of the series. The conglomerates apparently constitute the visible base. According to Hill, evidence of some older or lower-lying beds, plutonic, crystalline, granitic, or other, such as are reported from Cuba and Haiti, have been sought in vain. The Cretaceous beds referred to above contain the remains of very large Radiolites and Barrettia, a remarkable genus of Rudistes, while the fauna with Acteonella and Hippurites brings them into the same horizon as the Gosau beds of southern Europe.

The limestone districts.

The second important formation is the oceanic material constituting the white and yellow limestones, which rest unconformably upon, but do not completely overlap, the oldest formation. The interpretation of these limestones has been an important problem in Jamaica geology. It is possible they represent several distinct formations and ages, but the greater portion is doubtless of Oligocene age. The white limestones cover five-eighths of the surface of the island. They form the so-called plateau region, but are much dissected and rise in Clarendon to a height of 3,000 feet. The John Crow ridge (2,100 feet) is a remnant of the old summit level. Isolated remnants of the plateau occur also in the Healthshire Hills of St. Catherine, the Braziletto Mountains, and the Portland Hills of Clarendon. The Cock-pit country extending to the north and west of the Clarendon ridge is developed in the upper part of the white limestones. The many basin-shaped depressions and canyon-like valleys, illustrating the powerful effects of solution and erosion in this formation, constitute some of the most interesting physiographical features of the island.

Igneous rocks.

Rocks of an igneous character are widely distributed. They assume the form of dykes or intrusive masses and bosses, cutting up the Cretaceous and conglomerate beds and producing important modifications of texture. For instance, shales and clays are highly indurated and baked into porcelain and jaspery rocks and sands into quartzitic

beds. In St. Thomas-in-the-vale the igneous rocks are of a dioritic type, while further west great masses of porphyry are met with. The only locality in Jamaica where there is true volcanic rock *in situ* is at Black Hill, near Low Layton, midway between Buff Bay and Hope Bay. The amygdaloid basalts are exposed in a tunnel of the Jamaica railway and apparently extend to a depth of 700 feet below the summit. They form a volcanic neck rather than a superficial lava flow. The characteristic fossils indicate that the Montpelier limestones of the oceanic series were deposited contemporaneously or soon after this tertiary eruption.

Recent formations.

The more recent Jamaican formations consist of deposits of alluvium, oceanic marls, and coral-reef rock. These lie adjacent to the present coast, and represent fringing reefs and other accretions around the island border after it had attained its present area and outline. A narrow strip of low land extends almost uninterruptedly around the island between the sea and the lower coast hills. This is composed of elevated coral reef, marginal sea débris, and land alluvium. The Liguanea plain on which Kingston stands, and extending westward for twenty-five miles, is the largest of the coast plains. In economic geology and the occurrence of minerals and metallic ores, Jamaica is not remarkably rich. Copper is said to be widely diffused, both as a carbonate and in veins ; gold, lead, manganese have also been met with in small quantity. Two thermal mineral springs, one at Bath in St. Thomas-in-the-east, and the other at Milk River in Clarendon, are noted for their medicinal properties.

Earthquakes.

In historic times Jamaica has suffered from two severe earthquakes. The first, in 1692, overthrew a large portion of Port Royal, when 2,800 houses were destroyed. This led to the settlement of Kingston. The second severe earthquake took place in January 1907, when 800 lives were lost and property destroyed to the value of about two million sterling.

British Honduras.

The northern half of the Colony of British Honduras forms a vast plain of about 1,000 square miles, sloping gently towards the coast. In the southern half there are

several ranges of hills, culminating in the Cockscomb Mountains with Victoria Peak reaching a height of 3,700 feet. The prevailing type of formation is Tertiary, with underlying strata composed of granite, quartzite, and carbonaceous shales, sandstones, and limestones, cropping up in the low detached ranges intersecting the country to the west and south of Belize. The rivers flowing north-east and south-west from the interior mountains, or near the frontier of Guatemala, traverse valleys containing the rich alluvial soils known as Cohune ridges. Between these valleys are large stretches of country covered with dry gravelly or sandy soil supporting scattered patches of pine-trees and low palms. Further inland are elevated savannas and open grassy country with oak-trees. The river valleys or Cohune ridges yield fine mahogany, cedar, and logwood trees, and they constitute the chief agriculture areas of the colony.

British Guiana.

As may be assumed from the continental conditions existing in British Guiana, the geology differs markedly from that of the West Indian Islands. The coast lands, of varying width, form a plain of marine alluvium. The plain is broken here and there as in the north-west by low hills and traversed by lines of sand dunes of wind-blown origin. The sands and clays of the alluvial areas have been deposited in comparatively recent geological periods by the rivers from the high lands of the interior. Extensive beds of peat known as ' pegass ' occur in some localities. They vary in depth from 2 to 4 feet, but occasionally they develop a depth of 11 or 12 feet. What Professor Harrison describes as ' residuary deposits ' composed of sands and clays are found in the lowlands along the courses of the great rivers and the adjoining valleys ; also on the lower parts of many of the hills and mountains. The heavy tropical rains have carved out these deposits and the gravel, sands, and silts derived from the eroded material have been laid down in the wider valleys as fluviatile loams, gravels, and sands. It is in these deposits that ' the readily available mineral wealth of the colony is found '.

Turning to the sandstone and conglomerate series we find these occupy large areas of the colony. The name Kaieteurian has been suggested for this important group. It constitutes the greater portion of the Pakaraima Mountains and it spreads westward into Venezuela. The rocks appear to be unfossiliferous. Hence there is no evidence of their geological age. They lie invariably on the presumably Archaean rocks. According to Anderson, the Pakaraima Mountains may be regarded as the most extensive sandstone formation in the world. Brown and Sawkins estimate the total thickness of the sandstone formation at about 3,000 feet. More recent investigation has shown that probably it does not exceed that shown at Roraima, namely, about 2,000 feet. As a rule the sandstone lies nearly horizontally. Many of the beds of fine texture show well-marked current bedding. The general geological structure of the colony in the district not covered by the sandstone formation may be said to resemble closely that of the north-eastern sea-board of North America and of the Brazilian sea-board of South America north of Rio Janeiro. True granite is said to be not very abundant in British Guiana. The largest development is the great mass extending from Makauria Point on the Essequibo River to the south end of Karia Island on the Mazaruni River. Similar granites, but of a more gneissose structure, occur at Granite Island, at Canayaballi, on the Waini and Pomeroon rivers. The belts of granitoidal rocks, being more resistant to weathering than the gneisses, porphyries, and schists, usually give rise to ranges of low hills or to isolated rounded low hills, and where rivers have cut their courses across the belts of granite their occurrence is usually marked by the presence of rapids or cataracts. Large areas of the colony are occupied by quartz-porphyries, felsites, and schists. As a general rule these rocks yield comparatively easily to weathering agencies. It follows that the lower parts of the colony occupied by them consist of somewhat undulating land or plains. Again, in the elevated parts of the colony in which rocks of this group occur the

surface is interspersed with rugged ridges and hills with tabular masses forming in some districts a rough grass-covered country with occasional patches of forest. The basal rocks of the colony are gneissose. The commonest variety of gneiss is a grey or pinkish grey granitite-gneiss, which in places changes into a white or light-pink aplite-gneiss, or occasionally to dark-grey or greenish-grey quartz-diorite-gneiss, or to a still darker coloured diorite-gneiss. This fundamental gneiss of British Guiana is regarded as the most important source of gold.

The variety and character of the rocks briefly referred to above would indicate that in a tropical country of such vast extent natural features of a striking character are likely to be met with. The courses of the principal rivers are interrupted by many cataracts and rapids, and the streams which rise in the high plateaus of the interior make their descent by numerous lofty waterfalls. The finest of these are the Kaieteur Falls on the Potaro River, with a total height of 741 feet. The plateaus themselves are terminated in many localities by massive wall-like cliffs of great height, with the characteristic structure of cliffs caused by the action of sub-aerial denudation on horizontal or slightly inclined strata. When the plateaus have been forced by intrusive rocks to great heights the sandstones of the district give rise to imposing mountains, the upper parts of which exhibit lofty precipices 2,000 feet high, as in the case of the Roraima Mountain. In other districts the rivers have cut deep valleys in the sandstone country; many of them, as the Potaro valley, are of surpassing beauty. Altogether British Guiana is a magnificent country. It would well repay further exploration, and it would be in the interests of science as well as of the further development of its undoubted natural resources if facilities could be provided to reach the vast interior lands of the colony.

Minerals of British Guiana.

The chief minerals hitherto exploited are gold and diamonds. The gold, as already mentioned, is found in the districts occupied by the Archaean rocks, but usually only in payable quantities near the intrusion of basic

rocks. Gold is diffused through the mass of rock and is set free by gradual decomposition. It is afterwards accumulated in what are known as the auriferous gravels by the normal process of weathering and detrition. In some cases it is possible the placers have been enriched by solution and the re-disposition of the metal. Fissure veins are not common; but some auriferous veins exist in the Arakaka, Mazaruni, and Puruni districts.

The original source of British Guiana diamonds has not been fully ascertained. According to Harrison 'there are indications in some districts that they have been derived directly from the degradation of basic rocks; whilst in others, they may have been originally derived from such sources, whence they found their way by degradation and detrition of the rocks with the gravels in which they now occur'.[1]

Trinidad. While the general character of the formations in Trinidad is in some respects correlated with those of the northern islands, Trinidad geology may be regarded as largely South American. This is also exemplified in the fauna and flora. The position of the several strata in the geological scale is generally accepted as ranging from the lower Cretaceous to the middle Tertiary (Miocene). A considerable proportion of Trinidad is occupied by rocks of the latter age.

According to Wall and Sawkins, in the northern littoral range extending from east to west, from Point Galera to the Bocas Islands, the constituent strata consist of micaceous slates, sandstones, and shales. This formation, known as the Caribbean group, is met with also in the littoral chain of Venezuela. The central range (Older

[1] The earliest publication dealing with the geology of British Guiana was a series of reports by Mr. C. B. Brown, F.G.S., and Mr. J. G. Sawkins, F.G.S., in 1875. Since then, from 1897 to 1907, Professor Harrison, C.M.G., F.G.S., Director of Science and Agriculture and Government Geologist, with the assistance of Mr. Frank Fowler, Commissioner of Lands and Mines, and Mr. C. W. Anderson, F.G.S., Government Surveyor, has made a careful investigation of the geology of the goldfields and diamond areas and published a comprehensive report with a series of coloured maps (London: Dulau & Co., 1908).

Parian Group) comprises an indurated formation of lower Cretaceous age ; while the north-central and southern portions (the Newer Parian Group) consist of a considerable succession of limestones, calcareous sands, shales, clays, and marls of later date.

Principal rock-groups and their characteristics.

Caribbean Group. The chain of mountains forming the north coast facing the Caribbean Sea is composed of a large variety of rocks. The most prevalent are beds of mica-slate, sometimes appearing in layers of quartzose rocks separated by thin seams of mica. The mica possesses a peculiar glossy appearance, and presents numerous shades of white, green, red, and black. Quartzose slates frequently occur. Of sandstones there is a considerable variety, from fine to coarse-grained, some soft, others of the hardest consistency. Calcareous rocks are represented by two varieties, namely, crystalline limestone and compact limestone. The former occurs sometimes in massive beds, varying from white to blue in colour. Thinner beds from a few inches to several feet in thickness are also met with alternating with the slates and shales. The compact limestones form a portion of the Laventille Hills, near Port of Spain, and several of the islands, such as Gasper Grande and the Diego and Five Islands in the Gulf, where the limestone is quarried. In some instances there are caverns of considerable dimensions. One at Diego Martin has a considerable deposit of crystallized spar ; another at the base of the hill at Oropuche is the habitation of the curious bird, the guacharo or diablotin. Several beautiful waterfalls and cascades occur. The best known is the Maraccas, which falls perpendicularly 340 feet. The cascade of Diego Martin in wet weather is very attractive. It occurs in mica schist, with some calcareous slates.

Old Parian Group. The only part of the coast where the strata of this group are exposed is at Point à Pierre, about three miles north of San Fernando. There is a much larger development in the interior immediately to the south and east of the Montserrat Hills culminating in the Carata Hill and Mount Harris. Limestones are

rare. A peculiar indurated clayey stratum, 'argiline,' is extensively quarried for road-making at the hill of San Fernando, under the name of 'gravel'. Bituminous substances, semi-solid or more commonly liquid, issue from the soil at the base of the hill in several localities, and the springs rising in the gravel are also contaminated with an asphaltic oil and sulphuretted hydrogen which, according to Wall and Sawkins, tend to show that causes generating the formation of asphalt may have begun to operate even at the epoch of the formation of the older Parian rocks.

Newer Parian Group.. This comprises a considerable succession of limestones, calcareous sands, shales, loose ferruginous sands, conglomerates, clays, and marls occupying the basins of the Caroni and Ortoire rivers as well as the larger portions of the central and southern hilly districts. So far as may be gathered from the fossiliferous contents 'they present a certain analogy with the Miocene fauna'. The five divisions or series of the group as arranged by Wall and Sawkins are as follows: (*a*) Nariva series, forming the substrata to the well-known red soils of the island. (*b*) The Naparima marls, conglomerates, and calcareous sands. (*c*) The Tamana massive limestones, which form the most definite stratum of the whole island. This can be traced, with only one or two interruptions, from near the western to the eastern coast. There is only one common coral (*Orbicella*) which also occurs in the Naparima marls. (*d*) Caroni or carbonaceous series: there is a lower or non-carbonaceous division and an upper or carbonaceous division. Seams of what is called Tertiary coal occur in this series. They are said to be numerous and varying from a mere carbonaceous film to seams of over 4 feet in thickness. This lignite coal has not yet been proved of commercial value. (*e*) Moruga or arenaceous series. This occupies the whole of the southern portion of the colony from Cedros near the Serpent's Mouth to Points Galeota and Mayaro on the eastern coast. The distinctive features are thick strata of massive sand, generally loose and pulverulent. Shales

and shaly sands are numerous, also layers of lignite and lignitic shales.

According to Harrison and Jukes-Brown, the deposits of Trinidad included by Wall and Sawkins under the Nariva and San Fernando beds are probably of Eocene or Oligocene age; the Naparima marls are Miocene, while the Moruga series are probably of Pliocene and Pleistocene age. The Naparima marls consist of a lower division containing Globigerina and an upper division with Radiolaria and Diatomaceae, and are clearly of deep-sea origin.

Mineral resources.

The mineral resources of Trinidad are considerable, and in the near future they will assume large importance. Limestone is fairly abundant in the northern and central portions of the island. Gypsum is extensively diffused, but the only deposit in quantity is a stratum of dense crystalline structure, near St. Joseph. Asphalt occurs in numerous localities. At La Brea is the world-famous Pitch Lake, a vast deposit of asphalt 127 acres in extent. The asphalt and oil industry of Trinidad will be dealt with later.

Barbados.

There are no traces of volcanic rocks in Barbados. The older rocks in the north-east of the island, known as the Scotland series, are probably of Cretaceous age, while the oceanic and coral series belong to middle Tertiary or more recent deposits. The Scotland rocks consist of thick-bedded sandstones, coarse grits, bituminous sandstones, shales, and dark grey mottled clays with nodules of sandstone. The beds, which are much bent and broken, are estimated to be from 550 to 600 feet in thickness, but their base is nowhere exposed. Harrison and Jukes-Brown regard them as bearing a striking resemblance to the great series of sandstones and clays which underlie the Naparima series in Trinidad, both yielding asphalt and petroleum oils. Probably similar series exist in Venezuela and are portions of a vast Tertiary formation, which once extended over a large part of the south Caribbean region. Although the Cretaceous beds in Barbados are only exposed in the Scotland district, it

has been ascertained that they underlie the oceanic and coral series ; in fact extend under the whole island. The oceanic series comprise the white earths and chalks immediately above the Scotland series. At Bissex Hill, at the base of the coral limestone and resting unconformably upon the oceanic series, there is globigerina marl. Some of the beds are purely silicious and consist of the skeletons of Radiolaria and Diatomaceae mixed with spicules of sponges. In the calcareous earths shells of Foraminifera are common. It is probable that the siliceous Radiolarian earth was formed in a deep basin at depths of 2,000 to 4,000 fathoms at a time when the Atlantic and Pacific oceans were united and the isthmus of Panama did not exist. The oceanic deposits are not largely exposed. They underlie the coral limestone at depths of 50 to 200 feet. The coral rock or reef limestones cover six-sevenths of the surface of area of Barbados, that is, 144 out of 166 square miles. The limestone area consists of a number of separate terraces or platforms built up as fringing coral reefs as the island rose slowly out of the sea.

Mineral products.

Among the mineral products of Barbados are soft oolitic freestones or ' sawstones ' used for building purposes ; these harden on exposure to the air. From the more porous portions of the same beds large stone filters or ' dripstones ' are made. The coral rock everywhere affords excellent material for burning into lime. The lowest chalky deposits of the oceanic series are capable of being utilized in cement making. Perhaps the chief mineral products of Barbados will eventually be its petroleum and asphalt deposits. A pitch-glance, ' manjak,' is exported in small quantities to serve as a basis of black varnishes. A scientific investigation of the petroleum deposits in Barbados has recently been completed, and it is probable that efforts will be made to develop these deposits with great advantage to the colony. On two occasions, in 1812 and 1902, volcanic dust from the Soufrière at St. Vincent was carried by air currents in the upper atmosphere in a contrary direction to the

prevailing trade winds, and deposited at Barbados. Traces of the dust deposited in 1812 were recently found forming a thin black layer in the mud in cleaning out a pond near Bridgetown.

Windward and Leeward Islands.

As already indicated, most of the Windward and Leeward Islands, with the exception of parts of Antigua and Barbados, belong to the volcanic group, forming an arc of a circle extending from Saba southward to Grenada. They consist of masses of volcanic peaks and ridges dissected by deep gorges radially extending towards the sea. In some cases the peaks, as in Dominica, reach a height of 4,000 to 5,000 feet. There are practically no coastal plains in the volcanic islands : the only moderate slopes and flat areas are the reaches of the short valleys or fragments of low terraces. The foundations in most cases consist of old igneous rocks, covered by massive tuffs overlain by gravels and clays formed by the decomposition of igneous and other rocks. There are numerous indications of volcanic agencies still existing at Dominica, St. Lucia, and St. Vincent. A boiling lake was in eruption in Dominica in 1880 and a soufrière (literally, a sulphur mine) exists in the southern portion of the island. The term *soufrière* is often met with in the West Indies and is applied alike to volcanoes, like those of St. Vincent and Martinique, or to the numerous quarries of hot sand and boiling mineral springs, which are either the remains of ancient craters or minor eruptions from strata highly impregnated with volcanic elements. Another soufrière exists at Montserrat, and a third near the Pitons in St. Lucia. The famous Soufrière or volcano at St. Vincent was the scene of a terrible eruption in 1812, when the summit is said to have been blown bodily into the air. Two deep and rugged craters, the older and larger containing a small lake at a depth of 600 feet, with its waters impregnated with sulphur, remained until another series of violent eruptions took place on May 6, 1902, when about 2,000 lives were lost. A full account of these eruptions is given in a report by Dr. Tempest Anderson, F.G.S., and Dr. J. S. Flett, the Commissioners appointed

to make investigation by the Royal Society of London (*Proceedings, Royal Society*, vol. 70, pp. 426 et seq.). As in the case of the eruption of 1812, the volcanic dust was carried by an upper current in a contrary direction to the trade wind, and a large quantity fell at Barbados. There was no flow of lava at St. Vincent, probably owing 'to the enormous amount of imprisoned gas and steam in the molten magma'. A similar terrible eruption took place on May 8, 1902, at the volcano on Mont Pelée in Martinique, when in an avalanche of incandescent ash St. Pierre, the chief town, and the whole of its inhabitants, numbering 30,000, were completely overwhelmed.

Antigua. Geologically Antigua consists of three regions of Tertiary age, namely, the limestone region of the north-east, the central plain, and the hilly or mountainous region of the south-west. Dr. Watts has given some attention to the subject, and the following contains a summary of his observations.

The limestone region consists of a succession of low hills, occupying the northern and eastern sides of the island. The geological age and succession of the various rocks of which they are composed have not been clearly worked out. They appear, however, to consist of a lower series of hard crystalline limestones of Miocene age, and upon these have been deposited limestones and sands of the Pliocene and Pleistocene periods. This limestone region has been subject to much denudation and reconstruction in the repeated upheavals and subsidences that it has undergone. At one time it occupied a much larger area, as is evidenced by the extensive outliers of limestone existing in various parts of the central plain, as at Belmont, Briggins, Bath Lodge, Seaforths, Lower Freemans, and many other places. The rocks of these outliers are in parts highly silicified, giving rise to the marine flint series of some writers. A series of thin beds of recent age, containing many land and freshwater shells closely allied to existing forms, is found in the upper part of the limestone series; these beds are to be found near

St. George's Church, and form a definite horizon on the flanks of the hills throughout the district.

The rocks of the central plain underlie the limestone series ; they appear to consist of a series of mud-stones, sandstones, and grits of an estuarine character of Eocene age. In this series there occur abundant fossil woods, together with freshwater or brackish-water types of shells ; these are highly silicified, giving rise to the fresh-water flints of various writers. Fossil fish of an Eocene type have also been found. The fossil woods comprise a considerable number of forms of both monocotyledonous (palms) and dicotyledonous types. They have been but incompletely studied, and their relationships are very imperfectly known. These freshwater flints from their imperishable nature separate themselves by weathering from the softer rocks with which they are associated, and give rise to surface deposits of flinty blocks, which are so numerous in the central parts of the island as to be largely used for road-making. Some of the silicified fossils of tree trunks are of considerable size. A good example may be seen in the geological gallery of the British Museum of Natural History.

Extending right across the island from St. John's Harbour to Willoughby Bay, there exists a series of deposits of sands, gravels, and pebbles, probably of recent age, indicating that within comparatively recent times the sea flowed right across the central plain, when there probably existed an archipelago of small limestone islets, where the limestone area now is, and probably a higher rugged island on the south-western side of the channel, a condition somewhat similar to that now existing in the neighbouring island of Guadeloupe. As a result of the geologically recent submergence, the water existing in the rocks of the central plain is decidedly brackish, so that although existing in quantity, it is useless for economic purposes, while the trace of salt in the surface soil gives rise to some agricultural problems of difficulty in limited areas.

The third or mountainous district of the south-west is

commonly, but erroneously, described as volcanic. It consists of an extension of the Eocene beds of the central plain which have been upheaved and altered by volcanic action. This volcanic activity was not so violent as to give rise to extensive lava flows or beds of ash, but served to distort and elevate the low-lying beds of the central plain into rugged masses in the south-west. There are evidences of lava flows in the neighbourhood of Dimsdale Estate, near English Harbour, and at other places in this locality. Intrusive masses of andesite are to be found at Drew's Hill, and scattered throughout the whole region from the central plain to the southern and western coasts.

Dr. Watts adds that the geology of Antigua is of exceptional interest, and its careful and systematic investigation would probably do much to elucidate what is obscure in the general geology of the West Indies.

Bahamas. The Bahamas consist of a large number of scattered coral islands, or groups of coral islands, stretching from the south-east of Florida in a course nearly parallel to Cuba but outside and to the north of the main chain of the West Indian Islands. The long, narrow, and low character of the islands has suggested that their initial formation may have been due to the large quantities of sand and detritus brought out from the Gulf of Mexico by the Gulf Stream. With the check given by the north-easterly trade winds it is possible this material may have been gradually accumulated over the areas where the islands now stand. There would thus be laid a foundation for coral and other growth, and eventually land would appear. Support is given to this view by the fact that the islands have evidently been built up on the side on which the wind would have helped the sand and débris to accumulate. Dolley mentions that fossil corals of recent types are found much above high-water mark, and that large caves exist with their floors above tide-level, together with many other evidences of land elevation. Many of the islands show the formation of aeolian or sub-aerial rocks in progress, while in the great bights dividing Andros

Island and elsewhere the deposition of Foraminifera has been so great that former channels and sponging grounds have within recent years become too shallow for approach. While in some localities the Bahamas seem to be extending, changes in the configuration of some of the islands are going on due to erosion and local subsidences owing to the undermining action of the waves.

Bermuda. Bermuda consists of a singular agglomeration of small islands and submarine sandhills and coral reefs, forming an irregular ring about 22 miles in length and 3 miles in breadth. The highest point of Main Island is nearly 240 feet above the sea. In the Report of the Challenger Expedition it is pointed out that the Bermudas differ from an ordinary atoll, as there is no well-defined lagoon, and the land is higher than is usual in coral islands. It is probable that the group is situated on the summit of a huge cone with a wide base rising from the submerged plateau of the Atlantic. The coast is either rocky, presenting an irregular surface of weather-worn calcareous limestone, or sandy, the sand being blown up into dunes covering extensive tracts. In the interior hollows are peat bogs or marshes of considerable size. The islands may be regarded as wholly built up of coral limestone of varying degrees of hardness. There are numerous caves. One remarkable feature is the moving coral sand, or sand glacier, at Elbow Bay on the south side of the main island. In the shallow valleys there is a moderately rich red soil, which is well cultivated. There are no springs, and the inhabitants depend for their fresh water on the rainfall collected in tanks and reservoirs.

Hydrography

Jamaica. Jamaica, 'the isle of springs,' possesses numerous rivers and watercourses. Nevertheless there are areas inland singularly deficient of water. As the mountain ranges trend east and west, with two exceptions, the rivers flow north and south. Their course is necessarily short and steep. In the rainy seasons they become formidable torrents carrying everything before them. The chief

rivers are the Plantain Garden River, flowing east, and the Montego River, flowing west; the Rio Grande draining the northern slope of the Blue Mountains is one of the finest. The Black River in Westmoreland is practically the only navigable river in Jamaica; boats of considerable size can ascend a distance of 25 miles. In the central districts some of the rivers disappear into sink-holes in the limestone formation. There are several picturesque waterfalls and caverns.

British Honduras

The river system of British Honduras is extensive and serves as the natural highway into the interior. The Hondo and New rivers flow in a northerly direction. The former is the boundary between the colony and Yucatan. No less than 16 streams large enough to be called rivers descend from the interior mountains to the sea between the Hondo and the southern boundary of the colony. The Old or Belize River rising in Guatemala territory and crossing the frontier at the Cayo is the most important waterway in the colony. It is navigable for 'pitpans' (flat boats) for about 120 miles. The Roaring Creek Falls, between two precipitous cliffs, are of great natural beauty. The Sibun River rising in the Cockscomb Mountains passes through a rich agricultural country. The Manatee River has remarkable caves and the Sittee has numerous rapids. The Sarstoon River forms the southern boundary between British Honduras and Guatemala.

British Guiana.

As draining a portion of a vast continent the rivers in British Guiana are numerous and most imposing. The Essequibo with its several tributaries, of which the Cuyuni and Mazaruni are the most important, drains more than one-half the total area of the colony. The estuary of the Essequibo contains three extensive islands; one, Wakenaam, is nearly as large as Barbados. The Berbice River, next to the Demerara, is second in commercial importance, while the Corantyne, second in size, forms the boundary between British and Dutch Guiana. It is unfortunate that all the large rivers in British Guiana, above tidal influence, are obstructed by numerous rapids, cataracts, and falls that render their

PLATE XXIX. POTARO RIVER (UPPER REACHES), BRITISH GUIANA

(West India Committee: Phot. F. V. McConnell)

PLATE XXX. VIEW OF SCOTLAND FROM CHIMBORAZO, BARBADOS

(Phot. Government of Barbados, per West India Committee)

navigation both difficult and dangerous. Between some of these obstructions there are intervals of smooth water of varying extent, where steam launches afford access to some of the goldfields of the interior. The Demerara River has sufficient depth of water on the bar to allow of the passage of ocean steamers. Georgetown, the capital, has been established on its right bank, where the river has a width of three-quarters of a mile and furnishes a safe harbour.

Trinidad.

The extensive plains of Trinidad are traversed by numerous rivers and rivulets and the flanks of the mountains everywhere are drained by innumerable streams. The ranges along the northern coast give rise to several affluents of the Caroni River flowing westerly into the Gulf of Paria, and into the Oropuche River flowing easterly into the Atlantic Ocean. Other moderately large rivers draining the east coast are L'Ebranche and the Ortoire rivers. The latter is the largest river in the colony. On the west coast south of the Caroni are several rivers rising in the Montserrat Hills, also flowing into the Gulf of Paria. Between the Cipero and the Aripero rivers lies the extensive Oropuche or Grand Lagoon, intersected by channels, which expand at intervals into small lakes covered with reeds, rushes, and aquatic trees. Most of the Trinidad rivers are obstructed by bars and shallows. In the dry season, according to Verteuil, in some of the rivers, as, for example, the Guatero, the salt water reaches a distance of 18 miles inland.

The lesser islands.

In the northern islands, owing to the steepness of the mountain slopes and the short distance to the sea, the few rivers are rapid and easily flooded in the rainy season. In the dry season they are mere streamlets. None of them is navigable. In Barbados, Antigua, Bermuda, Nevis, and Anguilla there are practically no rivers worthy the name. In the limestone formation at Barbados numerous underground streams occur with outlets on the sandy beach. At Dawlish, near the Crane Hotel, there are fresh- and salt-water baths closely adjoining. Excellent water is pumped from the underground

streams for domestic and other uses. Owing to the abundant supply of such water, Barbados, although thickly populated (1,100 to a square mile), is very healthy.

Climate and Rainfall

As may be expected from the scattered character of the several colonies, extending over 45 degrees of longitude and 25 degrees of latitude, the conditions affecting the climate and rainfall of the West Indies are subject to considerable variation. With the sole exception of Bermuda the whole area is within the tropical zone, whose chief characteristics are a continuous high temperature and a heavy rainfall. Where high lands exist, as in the interior of British Guiana, British Honduras, Jamaica, and some of the Lesser Antilles, there are sub-alpine conditions accompanied by a lower night temperature and usually a heavier rainfall.

Jamaica. Jamaica has a great variety of climate. The mean temperature at sea-level at Kingston is 78·8° F., rising to 87·5° and sometimes 90° in the daytime and falling to 70·8° at night. As the temperature falls about 1° for every 300 feet of elevation, it is possible, in a few hours, to reach in the Blue Mountains a cool and delightful climate. The mean annual rainfall varies throughout the island from about 34 inches in the low lands to as much as 196 inches on the northern slopes of the Blue Mountains. Mr. Maxwell Hall has devoted close attention to the meteorology of Jamaica, and his publications furnish complete information on the subject.

British Honduras. Though situated within the tropics, the climate of British Honduras in some respects may be regarded as of a sub-tropical character. The maximum shade temperature at Belize is 90° F. and the minimum in the winter months is 62°. Sea-breezes prevail during the greater part of the year. The average rainfall at Belize is 81·48 inches. From the middle of February to the middle of May is usually the dry season. During the remainder of the year there is some rain during every month. The heaviest rains occur during the months of September,

October, and November, when about one-third of the total rainfall takes place. Hurricanes and cyclones seldom reach the coast.

British Guiana.

In British Guiana the climate, for a continental climate, is hot, but not unhealthy. The mean maximum temperature in Georgetown is 85·9° and the mean minimum 75·4°. The striking feature is the small amount of variation. The difference in the mean maximum temperatures of the hottest and the coldest months is only 3·2° F.; while the variation between the mean minimum temperatures is still less, being only 1·6°. December to March are usually the coolest months, while August, September, and October are the hottest. The average annual rainfall in Georgetown over eighteen years is 92·24 inches. The heaviest annual fall is 135·4 inches, and the lowest 52·70 inches. The county of Berbice has usually the lowest rainfall and Essequibo the highest.

Trinidad.

The climate of Trinidad in many respects resembles that of British Guiana. The mean maximum temperature at St. Clair Experiment Station, near Port of Spain, during six years, has ranged from 85·9° to 87·2° F.; and the mean minimum temperature from 69·3° to 69·9°. August is usually the hottest month and January to March the coolest. The average rainfall at St. Clair's during six years has been 64·92 inches.

Barbados.

Owing to its easterly position Barbados enjoys the full benefit of the invigorating trade winds, and the climate is justly regarded as one of the healthiest. Sir Charles Lucas justly remarks that the Barbados climate is better suited to Europeans than that of any other part of the western tropics. There they can settle, live, and thrive. Barbados is the most striking exception to the rule that the tropics must be peopled by others than the natives of northern Europe. During a period of ten years the average maximum temperature was 84·2° F. and the average minimum 75·8°. The mean average temperature was 79·9° and the average range 17·5°. January to March are dry and cool. Some rain falls in May and June. July is usually the wettest month, and July to October,

owing to the absence of the trade winds, are the hottest months. The average rainfall based on observations for sixty years is 62·5 inches. The heaviest rainfall was 91 inches in 1901 and the lowest 41 inches in 1863. It is claimed that there is evidence of periodicity in the Barbados rainfall.

Grenada. At Grenada the climate in the dry season is delightful. In the wet season, as in all other tropical islands, it is damp and hot. But for six winter months, say from December to May, it is excellent, and it is healthy at all times. The average annual rainfall at St. George's for fourteen years is 79 inches, and the highest and lowest readings of the thermometer for five years are 89·8° F. and 67·8°, respectively, the average mean temperature being 78·8° in the shade. The rainfall in other parts of the island is much greater; at the Grand Etang, in 1908–9, it was 168·68 inches.

St. Vincent. As in Grenada, the climate of St. Vincent in the dry season is very pleasant. In the wet season, and especially from August to November, it is hot, but not at all unhealthy, and fever is almost unknown. Taken altogether, St. Vincent is one of the healthiest islands in the West Indies. The average rainfall for nineteen years, measured at the Botanic Station near Kingston, is 105·67 inches; during the year 1911, 87·11 inches were recorded, but this was an exceptional fall. The highest reading of the thermometer in 1912 was 90° F., and the lowest 68°; the mean monthly temperature in the shade was 78°.

St. Lucia. The climate of St. Lucia differs very little from that of St. Vincent, but there is usually less rain. The island is healthy in the open country. Some cases of intermittent fever occur in the deep shut-in valleys on the western coast. The local rainfall near Castries is about 79 inches per annum. The mean annual temperature is 78° F.; the mean maximum 84°, and the mean minimum 71°.

Dominica. Dominica is very mountainous. The average rainfall during 1912 at thirty-four stations was 98·94 inches; the distribution of the rainfall is indicated by the following averages: twelve Leeward Coast stations 69·75 inches,

three Windward Coast stations 95·94 inches, thirteen inland stations 135·71 inches. The mean annual temperature in Roseau is 79·9° F.

The island of Montserrat is considered to be as healthy as Barbados. The average rainfall in 1912 was 41·33 inches (average of seventeen stations) and the mean temperature was about 80° F. There is no malaria in the island.

Antigua and adjacent islands.

Owing to the absence of rivers, the paucity of springs, and the almost complete deforestation of the island, Antigua is subject to frequent and severe droughts. The average rainfall is 45·6 inches, but the variation from year to year is considerable. Very similar remarks apply to Nevis and Anguilla, but less so to St. Kitts. The climate in these northern islands is generally healthy. The average annual temperature is about 79° F. The winter climate is pleasant. The Virgin Islands are constantly swept by the trade winds and the shade temperature varies between 65° and 86°.

Bahamas.

The northern islands of the Bahamas group lie just outside the tropics. The climate is delightful in the winter, when the range of the thermometer is from 70° to 80° F. In the summer, which is the rainy season, the thermometer ranges from 75° to 85° F., but the heat is tempered by cooling breezes. Occasional hurricanes occur in the summer season. The average rainfall at New Providence is about 45 to 50 inches. Numerous visitors from the United States arrive during the winter months.

Bermudas.

Owing to their geographical position the Bermudas have a climate of a very equable temperature, varying in the colder months from 55° to 70° F., but the heat in the summer months is very oppressive on account of the excessive moisture of a prevailing tropical wind. The winter temperature is about equal to the mean summer temperature of the British Isles, and the mean annual temperature reaches 70·9° F. On the whole the winter climate is agreeable, although storms are not infrequent. Bermuda is a favourite winter resort for Americans and Canadians seeking to escape the rigours of the climate

on the continent. Large hotels have sprung up and a considerable amount of money is expended in the islands.

Fauna

Wallace states: 'The West Indies are less clearly neotropical than the mainland, their poverty in mammals, as well as in most groups, being extreme. The resident birds, however, comprise neotropical genera—a fact which decides the region to which the islands belong.'

Jamaica. In the Greater Antilles Columbus found no quadruped sufficiently large to attract attention except a small dog, domesticated by the natives, and conies. The short-tailed cony is still met with in the rocky recesses in the mountains of Jamaica. Pigs introduced by the Spaniards in the sixteenth century are occasionally found wild in the Blue Mountains. The guinea-fowl from West Africa and the East Indian mongoose are naturalized. Alligators, numerous lizards, and three species of snakes are represented in the Jamaica fauna. The native and migratory birds number 189 species. Of these, 43 species are believed to be peculiar to the island. The John Crow vulture, from its size and soaring flight, is always visible. The song of the Antillian mocking-bird equals that of the English thrush. There are three species of humming-birds, eight species of doves, and nineteen species of ducks. The manatee and turtle inhabit the coast waters. Fish are abundant. The wandering black crab of the Blue Mountains is considered a delicacy. Jamaica is remarkable for the large number of species of Lepidoptera and other insects, and the fewness of the individual members actually seen. Land and freshwater shells are numerous and interesting.

British Honduras. British Honduras on the mainland possesses a distinct fauna in the puma or lion, the jaguar or tiger, the ocelot or spotted tiger-cat, the coyote or wolf-like fox, and the peccary or warree. Other animals found in the colony are red deer, tapir, the iguana, small ant-eater, the quash, armadillo, squirrel, gibonet, and conies. Alligators of large size infest most of the inland lagoons. Of monkeys

there are several species. Of bird life there is an abundance. The wild turkey is now met with very rarely; the handsome curassow is as large as a turkey. Other birds are the white egret, toucans, the guan, and such raptorial birds as the John Crow vulture, the osprey, and hawk. Snakes, scorpions, and numerous Lepidoptera and flies are abundant.

British Guiana.

As in the case of British Honduras the fauna of British Guiana is of a distinctly South American character. The largest mammals are the tapir or maipouri and the manatee. The guinea-pigs or cavies range in size from the adourie, hardly larger than a rat, to the great water-haas, or capybara, which may be compared to a small pig. Relics of the ancient fauna are represented by the marsupial opossums. The sloths are also of an ancient type. The monkeys are fairly common, among them the howling baboon. Bats are everywhere. The jaguar is the largest and most formidable of the felines. The number of species of birds in British Guiana is stated to be greater than in the whole of Europe, yet they are rarely seen in large numbers. The largest birds are the stately negro cop, or jabiru, and the fierce harpy. The hoatzin, or Canje pheasant, has claws on its wings in the young state and possesses eye-lashes. Of game-birds there are ducks, plover, pigeons, snipe, and spur-wing. The large alligator, or cayman, is found in the upper waters of the Essequibo and two smaller species are common on the coast. Snakes are fairly common; about half a dozen are poisonous. Tree-frogs are numerous. The rivers swarm with fish. The four-eyes scuttles over the mud as active as a lizard, and another fish curiosity is the little armoured passar, common in the trenches. The electrical eel is found in the interior waters. Insects are exceedingly numerous. The local museum possesses a collection of 20,000. The most interesting are the Mantidae (praying mantis), of a beautiful green colour; and the Phasmidae (walking leaf insects). Some of these have wing covers so closely resembling the leaves of plants that they are easily mistaken for the vegetable products around them.

Trinidad and other islands.

In the fauna of Trinidad are numerous animals not represented in the neighbouring islands. The large howling monkeys and a small whitish ape are common. The vampires attack horses and very occasionally oxen and even swine. The ocelot and the wood-dog are the chief carnivores. A small opossum is a destroyer of poultry. The agouti (one of the Cavidae) is present; its flesh, and that of its congener, the lapa or capa, is regarded as a delicacy. The armadillo and ant-eater, the peccary, and a small deer are also present. The manatee is very occasionally met with and the rorqual, allied to the common whale, is pursued for its blubber. Among birds the black corbeau and the crested gavilan are the largest of the feathered tribe. There are nineteen species of humming-birds. A nocturnal goat-sucker, the guacharo or diablotin, inhabits caves. There are several parrots and parakeets. The guan or penelope, the largest game-bird, is the size of a domestic fowl. Many migratory birds, such as the golden plover, numerous ducks, sand-pipers, curlew, and snipe, are autumn visitors. Some of the snakes, as the mapepire, cascabel, and the coral, are poisonous. The boa-constrictor is occasionally met with in the interior woods. The eastern birds of paradise have been successfully introduced into the island of Little Tobago in recent years. In the presence of a native monkey, of the agouti, and of the armadillo or tattou, the fauna of Grenada approaches that of Trinidad. It has no venomous snakes. The tarpon or *grand-écailles* affords good sport both in Grenada and Trinidad.

The Barbados and St. Kitts monkey (*Ceropithecus callitrichus*), now established in those islands, was introduced from Sierra Leone in slavery times. The English hare has been naturalized in Barbados for seventy years. The East Indian mongoose, introduced to Jamaica in 1872, to destroy rats in corn-fields, is now common in all the smaller islands. It has become very destructive to ground-hatching birds, lizards, and domestic poultry. A handsome parrot (*Amazona Guildingi*) is peculiar to the island of St. Vincent; and another rare parrot (*Chrysotis*

Augusta) is found only in Dominica. Some birds, as the burrowing petrels of Jamaica and Dominica, are probably extinct. The solitaire of Jamaica and the soufrière bird of St. Vincent, inhabiting mountain forests, are possessed of a singularly sweet note. Of eighty-two species of birds recorded at Barbados only fifteen are resident; the remaining sixty-seven are birds of passage or casual visitors. St. Lucia shares with Martinique in the presence of the venomous snake known as Fer-de-lance. In the case of St. Lucia it is said to be kept in check by the mongoose.

Vegetation

Jamaica. The sea-shore is often lined with extensive groves of mangrove and button trees (*Conocarpus*), with the seaside grape on sandy dry banks, associated with the goatsfoot (*Ipomaea*), prickly pear, and the nickar tree (*Guilandina*). The coco-nut palms form a characteristic feature of many portions of the coast. The woodland vegetation of Jamaica, on the lower hills and savannas, with an annual rainfall of thirty to fifty inches, includes several acacias, braziletto (*Peltophorum*), cashew (*Prosopis*), clammy cherry (*Cordia*), dogwood (*Piscidia*), ebony, fustic, lignum vitae, silk cotton, yoke-wood (*Catalpa*), locust, logwood, and gru-gru palm. The giant cotton-tree (*Eriodendron*) is one of the characteristic arboreal features of the island. Further inland, reaching to an elevation of 3,500 feet, intersected with valleys and slopes with an annual rainfall of seventy to ninety inches, the vegetation is of a more luxuriant character, and includes the West Indian walnut or cabbage bark (*Andira*), the commercial bitter-wood (*Picraena*), the broad leaf (*Terminalia*), West Indian cedar (*Cedrela*), horse-wood along the banks of streams, mahoe, mango, white bullet-tree (*Dipholis*), the St. Ann's yacca (*Podocarpus*), mahogany, maiden plum, and soap-wood. Above 3,500 feet, with a rainfall of ninety to one hundred inches, the vegetation partakes of a somewhat sub-alpine character, and the principal trees consist of juniper cedar (*Juniperus*),

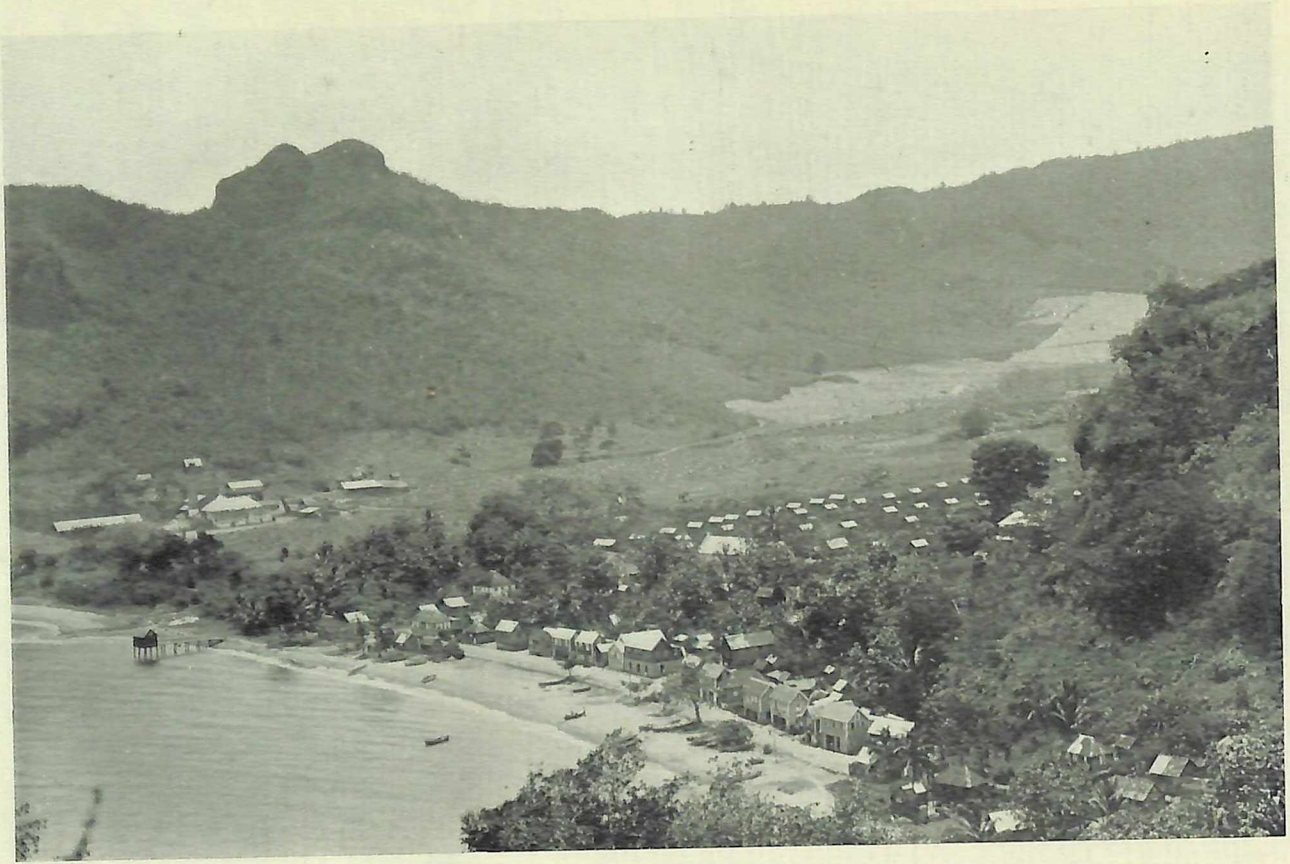

PLATE XXXII. LAYOU, ST. VINCENT, LEEWARD COAST (ARROWROOT AND COTTON CULTIVATION)

(Phot. Government of St. Vincent, per West India Committee)

duced from China by Captain Shaddock ; hence its name. Oranges, lemons, and citrons were introduced from southern Europe. The only tree native of Jamaica which is of commercial value is the pimento (*Pimenta officinalis*). This is spread by means of birds, who drop the seeds under the shade of bushes and trees in the neighbourhood. The total area of the forest lands, including those of secondary growth, in Jamaica is estimated at 1,230,000 acres.

British Honduras.

A prominent feature in the rich tropical vegetation of British Honduras is the presence of a pine, extending in places down to the coast. It is probably the same species (*Pinus cubensis*) as that occupying similar situations in the Isle of Pines off the south coast of Cuba. The pine and the pimento palm are the dominating trees on the pine ridges forming the watersheds between the river valleys. In some localities the ordinary pine-ridge vegetation gives place to groves of oak (probably *Quercus virens*). The Cohune ridges, between the pine ridges and the rivers, are so called in consequence of the predominance of the noble Cohune palm (*Attalea Cohune*). Each single bunch of fruit of this palm weighs about 280 pounds, and contains over 2,000 nuts—each the size of a hen's egg. Mahogany, cedar, and logwood abound in the interior forests, and the cutting and export of the timber of these and other trees, for a long period, has been the main staple of the colony. A native rubber tree (*Castilloa elastica*) yields central American rubber. Chicle gum is obtained from the naseberry tree (*Achras Sapota*).

British Guiana.

The coast of British Guiana, within reach of the tides, is covered by the white mangrove or courida. There are also the red and black mangrove. On sandy banks are the seaside grape, mahoe, and the olive-leaved bontia. Beyond the coast are flat grassy savannas, and in depressions with swamps thrive such palms as the eta (*Mauritia*), troolie (*Manicaria saccifera*), the manicole (*Euterpe edulis*), the giant marsh ferns (*Acrostichum aureum*), and numerous reeds and coarse grasses. Further inland are

sand reefs with stretches of wallaba trees and on the hill slopes the much-sought-for greenheart (*Nectandra*). In the valleys and along the river margins, amongst palms and other forest growth, the mora tree is conspicuous. If we ascend one of the great rivers in the lower reaches, we find, acting as an advance guard in defending their banks, masses of the gigantic arum (*Montrichardia*) eight to ten feet high ; next come tall water-loving trees and palms, draped with bush ropes and creepers, and further inland the massive forest growth of centuries. In marked contrast to these, extending miles inland, is the sparse vegetation of the sand reefs. The latter in past ages formed the coast line of the colony. The chief characteristic of the vegetation of British Guiana, so graphically described by Rodway, is ' altitude and size '. The trees are tall, the leaves broad, and the flowers immense. The forests cover about six-sevenths of the area of the colony. The forest products so far utilized are balata, gum animi, and rubber. Only certain of the more accessible districts have yet been tapped with the view of exporting timber. The chief timber trees are mora, greenheart, wallaba, and crab-wood. The last is excellent for all kinds of furniture. The existence of rapids and falls on all the great rivers, by obstructing navigation, prevents the vast and valuable forests of the colony from being fully utilized. The total value of the timber, shingles, firewood, and charcoal exported from British Guiana in 1912 was £17,139.

The services of a forestry officer has been secured in recent years and a general report on the forests of the easily accessible districts of British Guiana was issued in 1912. This review of the distribution and character of the forests, of the woods and forest-products most commonly exploited, of the bullet or balata trees and methods of tapping, of the occurrence of latex-producing trees likely to be useful for rubber purposes, and the methods adopted for the protection of the forests is a valuable contribution to the forest literature of the West Indies.

Trinidad. In many respects, as in the presence of the bullet and

mora trees and the timit or troolie palm (*Manicaria*), the flora of Trinidad closely resembles that of the mainland of British Guiana. There are, however, many species that are also found in the northern islands. Extensive mangrove swamps exist on the western shores. The vegetation generally is of a distinctly tropical character, with forests of lofty trees. Those on the margin or in the open country are covered with lianes or bush ropes and masses of epiphytes. The wide-spreading branches of the silk cotton and saman trees are favourite places for the growth of tillandsias or wild pines, numerous climbing aroids, orchids, and the pendulous cord-like stems of *Rhipsalis*.

In addition to the forest areas there exists in the central and southern districts of Trinidad a considerable extent of natural savannas which exhibit a vegetation of their own. This consists of coarse grasses, sedges, and scrubby growth of stunted chapara trees (*Curatella*) and bois sang (*Vismia*). The soil, composed of quartzose gravel and sand, is generally poor in quality. Near the coast some of the savannas are periodically inundated, others are dry plains or plateaus as at Icacos and Couva. Several forest trees, such as the poui (*Tecoma*), roble (*Platymiscium*), and the immortel (*Erythrina umbrosa*) brighten the landscape with their yellow, pink, and red flowers. Amongst palms the more notable are the stately cocorite (*Maximiliana*), the tall, columned moriche (*Mauritia*) and the palmiste (*Oreodoxa*), the prickly gru-gru (*Acrocomia*), and the gri-gri (*Martinizea*). The climbing *Desmoncus* is the nearest ally of the rattans of the East. The principal timber trees are bullet or balata (*Mimusops globosa*), mora, carapa or crab-wood, cedar, and locust. The bullet-tree is not largely utilized for the production of commercial balata, as in British Guiana. The export of native balata in 1912 was of the value of £177. The transit trade in balata from Venezuela and British Guiana was of the value of £476,861. Since the establishment of a forestry department in Trinidad in 1908, 266 miles of forest reserves

have been demarcated and 85 acres of new plantations started.

Windward and Leeward Islands.

With the exception of St. Vincent and Dominica there are comparatively limited areas of the original forest now remaining, and even these are being gradually reduced. Owing to the generally precipitous character of the coast, there are few mangrove swamps. The coast vegetation consists of the low growth of the turpentine tree (*Bursera gummifera*), white cedar (*Bignonia leucoxylon*), the manchineel, seaside grape, and mahoe. Where exposed to the full force of the trade winds the forest growth is stunted and wind-swept. Inland from the coast region, and reaching to elevations of 1,500 feet, there are scattered patches of indigenous trees with the poisdoux (*Inga*), the angeleen (*Andira inermis*), the bay-rum tree (*Pimenta acris*), locust, loblolly, galba, fiddle-wood, with an occasional bullet-tree (*Dipholis*). On the moist high ridges *Weinmannia*, angelica (*Sciadophyllum*), mountain guava, and several species of *Myrtus* and mountain cabbage palms are met with. In sheltered situations and ravines are numerous tree-ferns, climbing vines, and ground vegetation of mosses, Peperomias, begonias, and shade-loving ferns. On hilly slopes denuded of trees are tangled masses of a hardy fern (*Gleichenia*) with coarse grasses and cyperoids. On dry rocks inland, and often overhanging the sea, are numerous Agaves, Furcraeas, Tillandsias, and Pitcairneas. *Agave Kerrato*, with its erect pole surmounted by clusters of yellow flowers, is a striking object in the spring months. In dry districts in Antigua, Barbuda, St. Kitts, and the Virgin Islands the vegetation is largely comprised of scrubby crotons, spiny acacias, the inkberry (*Randia*), Turk's head cactus, and coarse grasses. The more common palms are the gru-gru (*Sclerocarpas*), several thatch palms (*Thrinax*), and the wild coco-nut (*Cocos amara*). The Dominica flora presents a marked exception to the arid conditions existing in the northern islands. It is particularly rich in palms, ferns, and shade-loving plants. At Barbados the small-leaved mahogany sows itself spontaneously in

certain localities, and, if not kept in check, it and the white cedar would in process of time cover the whole island. An intelligent and careful treatment of the remaining forest areas in the Windward and Leeward Islands would undoubtedly have a beneficial effect in conserving the water-supply and in maintaining a moist atmosphere favourable to the growth of the chief staples. At Grenada a forestry board has been formed. Some efforts in the same direction have been made at St. Kitts and Montserrat. An Arbor Day movement was started by the Imperial Department of Agriculture in 1902 for the encouragement of tree planting. The results have been successful, both directly and indirectly. More attention is given to the selection and cultivation of specimen trees for ornamental and general purposes. In schools it has been inculcated that 'trees tend to preserve water in springs and rivers, preserve soil from floods, temper the climate, protect birds, yield fruits for man's enjoyment, provide material for his work and fuel for his fire, and above and beyond all make the beauty of a country'.

Barbados.

Barbados is so extensively occupied with cultivation that the original trees are found in few localities. Schomburgh, in 1847, described one such locality as follows: 'Turner's Hall Wood, a remnant of the tropical forest, clothes a ridge or spur which stretches from the semicircular cliffs to the north-east; it consists almost entirely of locust, cedar, fustic, and bully trees: some of these trees are of considerable height, and approach in size those of the equatorial forest. The lover of nature can only indulge the hope that this relic of the former forest may be kept sacred, and may not fall a sacrifice to the all-engrossing sugar-cane.' Turner's Hall Wood still exists, thanks to the intelligent interest taken in it by the owner and his representative in the island. Barbados is the only colony where direct encouragement is given to the systematic planting of trees. 'A bounty of twenty shillings for each acre for seven years is given to the owner who plants his land in that way. Also,

land exceeding one acre in extent, planted with mahogany trees in the manner specified in the Preservation of Trees Act, No. 1 of 1875, is exempt from all taxation.' Inspectors are appointed under the Act whose duty it is to report annually upon the condition of the trees. The reports of five inspectors were published in the *Official Gazette* of February 27, 1905. These show that in five parishes inspected there were about 400 acres of land planted, cared for, and protected as required by the Act. The trees planted are chiefly mahogany, but white-wood (*Tecoma*), fiddle-wood, manchineel, and several others are extensively planted. The landscape in Barbados is much improved by the presence of these trees ; and when they are planted in groups around the residences dotted about on the sugar estates they supply grateful shade and add to the health and comfort of the inhabitants.

Bahamas. The flora of the Bahamas is almost wholly maritime, yet a few species occur that have not been found elsewhere. It is also Cuban in character, and as many as 129 species reach southern Florida. Specially noteworthy among the plants peculiar to the Bahamas is *Pinus bahamensis*. It occurs in New Providence and several of the other islands. It is a very distinct species with leaves (in clusters of three) a foot long. A curious feature in the flora, noticed by Eggers and Hitchcock, is the existence of hairy and smooth varieties of the same species growing intermixed.

Bermuda. The all-pervading cedar (*Juniperus*) is the chief indigenous tree of Bermuda. Its associate, the palmetto palm (*Sabal*), is probably endemic. Other endemic plants are a composite *Erigeron*, Lefroy's *Statice*, an iris (*Sisyrinchium*), *Carex bermudiana*, and three ferns. The only orchid found in Bermuda is a terrestrial *Spiranthes*. The Bermuda flora is of comparatively recent derivation. It is not, as supposed, of purely West Indian origin ; but according to Helmsley was partly derived from the West Indies, and from the region of south-eastern North America, where the West Indian and North American types of vegetation overlap each other. In a flora of

326 species there is a probable indigenous element of 144 species. The latter are made up as follows: dicotyledons 85, monocotyledons 35, and vascular cryptogams 24 species. There are several introduced plants prominent in the present vegetation. The lantana (sage bushes) are spreading with such vigour as to threaten the extinction of many of the rare indigenous plants. The oleander is mentioned as another formidable enemy.

CHAPTER XIV

ECONOMIC CONDITIONS

By Sir Daniel Morris

Agriculture

As agriculture is the main business in the West Indies it is desirable to deal with the subject in some detail. Sugar trade. In the eighteenth century the West Indies produced nearly all the sugar, rum, coffee, cotton, and other tropical products imported into the United Kingdom. That was the period of their great prosperity. The decline of West Indian prosperity had begun earlier, but the total abolition of slavery, in August 1838, gave a crushing blow to it. In some of the colonies the cultivation of sugar was still continued, but under considerable difficulty. Then as new fields for the production of cane sugar were opened in other parts of the world, and the production of beet sugar on the continent of Europe, under a system of bounties, was increased in twelve years, 1882 to 1894, from 1,783,200 tons to 3,840,256 tons, the position in the West Indies began to be an anxious one. Another circumstance, the shutting out of West Indian sugar from the American market by a duty of 90 per cent. *ad valorem*, added to the gravity of the situation. In 1895, when matters had become acute, representations were made to the Imperial Government, pointing out that it was impossible

for the colonies to provide without external aid for their government and administration, and that the depression under which they suffered was mainly caused by the competition of beet sugar produced under a system of bounties adopted in European countries, which bounties had, at that time, been greatly increased. On the recommendation of Mr. Chamberlain, then Secretary of State for the Colonies, a Royal Commission was appointed in December 1896 to obtain full information as to the facts and causes of the depression, and the general condition and prospects of the colonies.

Royal Commission of 1896.

In their report, which appeared in the autumn of 1897, the commissioners stated that in most of the West Indies the products of the sugar-cane constituted by far the larger proportion of the total exports of native produce, and that in the event of a failure of the sugar industry the welfare of each colony would then depend on the extent to which it might be possible to establish other industries.

The commissioners recorded as their opinion that the depression in the sugar industry was due ' to the competition of other sugar-producing countries, and in special degree to the competition of beet sugar produced under a system of bounties '. They submitted that ' the best immediate remedy . . . would be the abandonment of the bounty system '. In the meanwhile they recommended certain special remedies, such as improved steam communication with outside markets and between the different islands, and the organization of a scientific department to assist the sugar industry and encourage, where conditions were favourable, minor agricultural industries, together with a general improvement in the system of cultivation of the principal crops.

Imperial Department of Agriculture.

Most of the recommendations were sooner or later adopted by the home government, including the creation of an Imperial Department of Agriculture for the West Indies. For the latter, on the motion of Mr. Chamberlain, funds were voted by Parliament on August 2, 1898. The average amount expended from 1898 to 1908 was at the rate of £14,700 per annum. The duties entrusted to the

department were the general improvement of the sugar industry and the encouragement of a system of subsidiary industries in localities where sugar could not be grown, or where the conditions were more favourable for the production of cacao, coffee, bananas, oranges, limes, cotton, rubber, coco-nuts, sisal hemp, rice, nutmegs, pine-apples, and other crops. In addition, it was proposed it should devote attention to the improvement of the breed and condition of cattle, horses, and small stock, and to the extension of bee-keeping for the production of honey and bees-wax.

The sugar experiments carried on with the assistance of the department have proved of great service to the planting community in the West Indies. It is estimated that fully one-half of the canes now cultivated in the West Indies are new canes yielding over large areas mean results ranging from 5 to 10 and up to 25 per cent. higher than the older varieties. The grants in aid of sugar experiments from 1898 to 1910 amounted to a total of £58,852. They included £3,852 to British Guiana, £20,000 to Barbados, £14,000 to the Federal Government of the Leeward Islands, £9,000 to the Presidency of Antigua, and £12,000 to the Presidency of St. Kitts-Nevis.

The results of the efforts of the department, ably supported by the officers of the local departments in the colonies concerned, were presented and discussed year by year at the West Indian Agricultural Conferences held at Barbados, Jamaica, and Trinidad. A summary was presented to Parliament in April 1906 (Cd. 2901). A fuller statement covering a period of twelve years, 1898 to 1910, was published in the *West Indian Bulletin* (vol. xi, pp. 231–448).

Other agricultural departments.

One of the indirect results arising from the success of the Imperial Department of Agriculture in the West Indies, the first effort of the kind in the tropics, was the formation of a series of similar agricultural departments elsewhere. The first of these was the Imperial Department of Agriculture in India. This was followed by the formation of the Department of Science and Agriculture in British

Guiana. The other agricultural departments that have been formed since are those in the Federated Malay States, British East Africa, the Gold Coast, Southern Nigeria, Ceylon, Mauritius, Jamaica, Trinidad, Barbados, and Bermuda. Two officers trained in the West Indies are attached to the Imperial Department of Agriculture in India, two are attached to the Agricultural Department in the Federated Malay States, one in British East Africa, one in Mauritius, one in Fiji, and three in the Indian Provincial Departments of Agriculture.

Recent agricultural development.

A striking proof of the recognition of the value of science in assisting agricultural industries is the considerable sums now provided in the West Indies for the maintenance of scientific and agricultural departments. In the four principal colonies, viz. Jamaica, British Guiana, Trinidad, and Barbados, the total expenditure on agricultural services in 1898 amounted to about £14,000. In 1912 the colonial legislatures voted for these services a total of £44,331, or more than three times the amount provided in 1898. Further, the members of the planting community in Trinidad have agreed to submit to a voluntary tax on exports for the purpose of employing additional experts to deal with insects and fungoid pests, for carrying on experimental work and collecting and distributing agricultural information and statistics. The total amount provided by the voluntary tax in 1912 was £3,669. Similar action has also been taken by the planting community in British Guiana. It is probable that the total expenditure on agricultural services in all the West Indian colonies is now not less than £60,000 per annum. There can be no doubt, therefore, as to the considerable awakening that has taken place in the West Indies in recent years, with the result that there has been general improvement financially. Lord Crewe was in a position in 1909 to announce that 'no West Indian colony was then in receipt of grants-in-aid'; in fact, they all had comparatively large sums (£10,000 to £50,000) in reserve to meet emergencies without appealing for outside help. It is only right to mention that there were a number of

circumstances that combined to bring about this new era of prosperity in the West Indies. In the first place, the action taken by the Imperial Government to obtain the abolition of the continental bounties brought a revival of confidence in the sugar industry, with the result that capital was available for the improvement of machinery and the establishment of new central factories. A further improvement was brought about by the increased production of cacao in Trinidad, Grenada, and the other colonies; and by the enormous development of the trade in bananas between Jamaica and the United States. The introduction of Sea Island cotton into St. Vincent, Barbados, and the Leeward Islands, in 1903, increased the value of the exports from these colonies to the extent of nearly £200,000 per annum, and the extended cultivation of rice in British Guiana and limes in Dominica added to the general prosperity.

In 1909 a Royal Commission (more fully dealt with in a later page) was appointed to inquire into the commercial relations then existing between the Dominion of Canada and the West Indies, and the steps that might be taken in order to secure and develop mutual trading facilities. As a result of the work of this commission, Canada and the West Indies have now concluded a treaty of mutual advantage which will afford a favourable market for West Indian sugar and other commodities in Canada. This agreement is regarded as likely to add to the stability of conditions in the West Indies and promote their general welfare.

Sugar industry: Jamaica.

Sugar was formerly the chief source of wealth in Jamaica. In recent years, owing to the bounties on beet sugar and the competition of other and more remunerative industries, sugar in Jamaica occupies a secondary position. The average value of the sugar and rum exported during the five years 1907–11 amounted to £326,117, or 13·5 per cent. of the total exports. In 1881 sugar and rum represented 46·3 per cent. of the exports.

The sugar plantations in Jamaica number seventy. They are mostly small, varying from 200 to 500 acres. A few estates contain from 600 to 1,000 acres each. The

total area under canes in 1912 was 34,766 acres. The manufacture of Jamaica rum receives a large share of attention. The average annual export is 1,300,000 gallons. Nearly all the rum is exported to the United Kingdom. The sugar finds a favourable market in Canada. The Governor, in his Annual Report for 1911–12, states that 'progress continues in the sugar industry and much improvement in manufacture has now been secured by the introduction of modern machinery. The centralization of contiguous estates is proving a successful means of increasing the output of sugar'. Three new central sugar factories have lately been established in the district of Vere, and two similar central factories are at work in the north-west of the island. Improvement in the yield of canes is also in progress. Two new seedling canes from Barbados (B. 208 and B. 147) have been introduced; also a new seedling cane (D. 625) from British Guiana. These and others are spoken of as of undoubted merit and deserving of the general attention of planters.

British Guiana.

The sugar industry is the most important in British Guiana. It contributes 75 per cent. of the total value of the exports and about 33 per cent. of the wage-earning portion of the population are indirectly associated with it. The sugar estates are all situated on the coast and for a short distance along the banks of the larger rivers. The exports in 1911–12 were 99,378 tons of sugar, 3,022,831 gallons of rum, 146,740 gallons of molasses, and 5,102 tons of molascuit. The last is a cattle food prepared from molasses and the finely crushed fibre of the sugar-cane. The total area under cultivation in sugar-canes is about 69,000 acres. A considerable area of the front lands abandoned in sugar is being planted with rice and cocoanuts. The sugar industry in British Guiana is largely dependent upon the introduction of coolies from India. The average importation during the ten years ending 1901 was 4,120 per annum, and for 1901–11 the average has been 2,435. The chief class of sugar produced is known as 'grey' or 'dark' crystals. In addition, the well-known yellow 'Demarara crystals' are prepared for

the English market. In recent years, owing to the preference given to West Indian sugar by Canada, more than two-thirds of the exports now go to that country. British Guiana is the largest exporter of rum in the West Indies. The bulk is shipped to the United Kingdom. Careful scientific experiments have been carried on since 1882 with the view of improving the sugar industry. The experiments with new seedling varieties under the capable direction of Professor Harrison have for their object the production of new sorts of canes immune to disease, and yielding a larger percentage of sugar. The acreage under seedling and other varieties, other than Bourbon (formerly the standard cane of the colony), in 1911 was 46,301 acres, or 67·4 of the total area under cultivation. Experiments with manures for sugar-cane have also been carried on on a large scale.

Trinidad.

The value of exports of sugar, rum, and molasses from Trinidad in 1910–11 amounted to £723,949. The value in 1911–12, owing to drought and disease, fell to £530,404. The average value during the five years 1908–11 inclusive was £560,532. A serious pest to sugar-cane, known as the frog-hopper, has appeared during recent years, and, in spite of efforts to deal with it, it occasionally causes considerable loss in certain districts. In an official publication issued by the Board of Agriculture it is estimated that the aggregate loss due to the attacks of the frog-hopper amounts to over £50,000 per annum. An appreciable quantity of canes is grown by peasant farmers, and sold to the central factories. In 1910 there were 12,263 cane farmers (of whom 6,443 were East Indians) and they raised 176,447 tons of canes. On this account the sugar cultivation and manufacture of sugar is regarded as an important factor in the welfare of the chief sugar districts of the colony. The output of the largest central sugar factory in 1910 was 16,116 tons of sugar.

Barbados.

The sugar industry is also the mainstay of Barbados. The cultivation of the sugar-cane was begun in Barbados about the middle of the seventeenth century, and has been continued uninterruptedly to the present day. The

average exports consist of 38,000 tons of sugar and 35,000 puncheons of molasses and syrup. About 90 per cent. of the sugar is the brown quality known as ' muscovado '. Some of the larger estates also prepare vacuum pan crystals. The exports of sugar and molasses from Barbados during the year 1910 were as follows : Muscovado sugar, 35,906 tons, of the value of £350,084 ; dry sugar, 3,993 tons, of the value of £45,920 ; and 77,722 puncheons (100 gallons each) of molasses, of the value of £310,888, making a total value of sugar and molasses of £706,892. Of this amount sugar, syrup, and molasses of the value of £483,711 were shipped to Canada.

Leeward Islands.

Sugar is the largest and most important agricultural industry of the Leeward Islands, and constitutes the principal source of revenue in Antigua and St. Kitts-Nevis. The annual production is about 25,000 tons of sugar and a considerable quantity of molasses and syrup. An important advance in the history of the sugar industry in the Leeward Islands is the introduction of the central factory system, whereby the old-fashioned and wasteful muscovado process has been superseded by modern and economical methods of manufacture. Two central factories were started in Antigua in 1904, and seven years' experience has fully proved the value of the system. The Gunthorpe factory has been enlarged to a yearly capacity of 8,000 tons of sugar. Peasant farmers' canes are also purchased at these factories. In 1911 a central factory was erected at St. Kitts with a maximum output of 10,000 tons of sugar. When working to their full capacity the central factories at Antigua and St. Kitts will be able to deal with more than one-half the total sugar output of the islands. This will result in a larger amount of sugar being produced than formerly, and the quality will be improved so as to obtain higher prices. Considerable progress has also been made during recent years in the introduction of new and improved canes to replace the Bourbon cane formerly cultivated in the Leeward Islands. White transparent and the best of the new seedling canes are now widely cultivated in Antigua and St. Kitts.

Cacao

The principal crops of cacao are produced in Trinidad, Grenada, Jamaica, St. Lucia, and Dominica. Its importance may be estimated from the fact that cacao is the principal crop of Grenada, and the value of exports from Trinidad is more than double that of sugar. The cultivation is steadily extending, but, as Dr. Watts remarks, it is doubtful whether the output is increasing as fast as might be expected from the extent to which new plantations are carried on. This, he says, is a subject that deserves careful attention. The total annual production of West Indian cacao is about 670,000 cwt., of the value of £1,800,000. Trinidad and Grenada between them produce about 85 per cent. of the total exports.

The demand for raw cacao is largely extending in the United States, France, and Germany. Great Britain stands fourth on the list of consumers of cacao. The crops of cacao are easily affected by the character of the season at the time of flowering; also by conditions of soil, cultivation, manuring, and the presence of blight and pests. Much interest has been taken in recent years in the selection and cultivation of improved varieties of cacao, and their suitability for particular districts, and the requirements of the chief markets; also there is useful experimental work being carried on in introducing the system of grafting the most productive sorts of cacao, instead of raising them from seed. Dominica is leading the way in this direction.[1]

[1] The exports of cacao during the five years 1906–7 to 1910–11 were as follows:

	1906–7. *cwt.*	1907–8. *cwt.*	1908–9. *cwt.*	1909–10. *cwt.*	1910–11. *cwt.*
Trinidad . .	246,169	444,023	438,724	460,492	516,595
Jamaica . .	47,564	47,469	49,142	57,454	41,444
Grenada . .	73,743	102,483	101,370	108,128	118,667
St. Lucia . .	14,100	15,353	12,098	19,554	14,610
Dominica . .	11,208	11,463	9,537	10,680	10,055

The values of these quantities are shown in the following table:

	1906–7. £.	1907–8. £.	1908–9. £.	1909–10. £.	1910–11. £.
Trinidad . .	802,070	1,786,386	1,152,285	1,131,425	1,230,097
Jamaica . .	109,992	151,903	90,914	110,049	101,448
Grenada . .	166,538	361,128	311,519	248,398	259,365
St. Lucia . .	41,538	47,292	30,487	40,937	40,935
Dominica . .	34,653	35,440	29,486	23,051	21,645

Fruit.

The West Indies produce in abundance all the choicest fruits of the tropics. Pine-apples, mangoes, oranges, grape fruit, melons, passion fruit, papaw, and cherimoya are plentiful in Jamaica, and almost to the same extent in Dominica. In some of the other colonies they are somewhat less abundant. In British Guiana some fruits, such as mangoes, passion fruit, and pine-apples, are of exceptional quality. Bananas, oranges, limes, and grape fruit form the bulk of the fruit exported to northern latitudes. By far the largest tropical fruit industry in the world has been developed in recent years at Jamaica. Fruit, principally bananas and oranges, now forms 58·3 per cent. of the total exports of the colony. The value in 1912 was £1,624,245.

The principal market for bananas is in the United States of America. The exports in 1912 were 16,497,385 bunches to the United States and 150,678 to Great Britain. Oranges were shipped to the value in 1910 of £54,902. Grape fruit was exported in the same year to the value of £23,300. The fruit exports generally are subject to considerable fluctuations from year to year, depending on the season and the demand. Some small shipments of bananas are made from Trinidad and Barbados. Bananas and plantains of the value of £23,319 were shipped in 1911 from British Honduras, and grape fruit, oranges, and fresh and preserved pine-apples were exported from the Bahamas to the value of £9,176.

Limes.

One of the most promising of the newer industries is the cultivation of the West Indian lime. This, it may be mentioned, is a variety of the lemon, but the fruit is smaller, with a much thinner rind, and it is claimed that the juice is richer in acid contents. The trees are of the size of an average apple-tree and the branches are ordinarily furnished with prickles or spines. There is a spineless variety, and also one that produces fruit without seeds. In Dominica it has been stated that the fruit borne by spineless trees yield on an average acidity of 14·4 oz. of citric acid per gallon of juice

as compared with 13·3 oz. per gallon obtained from the ordinary variety. Apparently this is not constant under all circumstances, and the matter requires further investigation.

Lime products form the principal exports of Dominica, and largely also of the island of Montserrat. A large tract of land is in course of being established in limes at British Guiana. Of this 650 acres have lately been planted. Limes are also being grown at St. Lucia, Carriacou, and Antigua. Fresh limes are exported from Dominica to the annual value of £10,000. Limes can be used for every purpose to which the lemon is applied, and they are esteemed as being more economical, and superior to that fruit. Raw lime-juice is exported for making cordials, while concentrated lime-juice forms an important source of commercial citric acid. The standard at which concentrated lime-juice is sold is a pipe of 108 gallons testing 64 oz. of acid to the gallon. The equivalent of this in the West Indies is a 52-gallon hogshead testing 133 oz. to the gallon. The manufacture of citrate of lime is also being carried on in the West Indies. In regard to the prospects of this new development an authority on the subject states, 'Citrate of lime is preferred to concentrated juice by acid makers. . . . A higher price is paid for lime citrate than for juice, and there is a considerable saving in freight, casks, and loss by leakage. . . . We believe that more citric acid can be saved in making citrate than in making concentrated juice. The demand for citric acid averages about 6,000 tons of citrate per year, of the value of over half a million sterling.'

Other products of the lime industry are pickled limes, hand-pressed essential oil of limes, and distilled lime oil. The total value of the lime products shipped from Dominica in 1911 was £70,790, including £19,260 the value of citrate of lime. The value of shipments of similar products from Montserrat in 1911–12 was £41,665.

Coco-nuts.

In view of the recent appreciation in prices of coco-nut

products, it is anticipated that increased attention will be devoted to the industry in suitable localities in the West Indies. It is not improbable that the cultivation may prove very remunerative, as there are large markets available, both in the United States and in Great Britain. Coco-nut production has already assumed considerable proportions. The total exports of nuts in 1912 reached a value of £220,647. In addition, coco-nuts are largely utilized locally for a variety of purposes. In British Guiana and Trinidad, where there is a considerable consumption of coco-nut oil among the East Indian coolies, the locally produced article has gradually displaced the imported coco-nut oil. Other coco-nut products are copra (dried kernel) and coco-nut meal for feeding cattle.

There are extensive areas of coastal lands admirably adapted for coco-nut growing in British Guiana, Trinidad, and British Honduras outside the hurricane regions. In British Guiana 12,236 acres are under cultivation. During 1911–12 the exports were over one and a half million nuts. The exports of nuts from Trinidad in 1909 amounted to 20,000,000 nuts, of the value of £72,557. Even in Jamaica, where a hurricane occasionally occurs, coco-nut cultivation has assumed as large proportions as in any of the other colonies, if not larger. The exports in 1911 were 20,457,000, of the value of £98,687. In the Report of the Agricultural Department for 1912–13 the director states 'the progressive recovery of the exports of coco-nuts from the disastrous set-back caused by the hurricane of 1903 has been maintained, and an export of 23,000,000 nuts since the disaster of nine years ago'. About 400 acres have recently been planted in coco-nuts in Antigua and Nevis. Sir William Lever is credited with the opinion 'that there is no field of tropical agriculture so promising at the present moment as coco-nut planting'.

Cotton.

At one time the West Indies produced practically all the cotton used in the United Kingdom; but as sugar

was found more profitable the cultivation of cotton was abandoned. A small peasant industry still survived in the island of Carriacou; but elsewhere attention was devoted to other crops. In order to broaden the basis of prosperity and compensate for the falling off in sugar, the Imperial Department of Agriculture in 1903 obtained seed of the best Sea Island cotton from South Carolina of the value of £500, and distributed it among the planters in the West Indies. In addition, a staff of instructors was employed to give assistance and advice to the growers, and a number of ginning factories was established to deal with the crop. Thus was laid the foundation of an important new industry. The crop produced in 1904 was of the value of £32,000; in 1905 it had increased to £63,000. The total exports of West Indian cotton during the period from 1904 to 1912 have reached a total value of over a million sterling. Valuable services in this connexion were rendered by the British Cotton Growing Association and Sir Alfred Jones, in making grants of money and machinery, also in taking charge of the shipments of cotton at Liverpool and obtaining the best market for them. The Association also arranged for the expert assistance of Mr. E. Lomas Oliver, who visited the West Indies in order to advise the planters as to the requirements of the Lancashire spinners and provided for the services of a travelling inspector to carry on investigations in connexion with the industry. It is admitted that if Sea Island cotton had not been obtained in appreciable quantity in recent years from the West Indies, several of the fine-spinning cotton mills in Lancashire would have been compelled to work short time. It is interesting to learn that the island of St. Vincent produces the highest class of cotton grown in any portion of the British Empire. The price in some years has reached two shillings and eightpence per pound. Sea Island cotton is remarkable for its strength and fineness. The best qualities are used for making Brussels lace, chiffon, and other delicate articles. The coarser sorts are

utilized for the sails of yachts, tyres of motors, and American mail-bags.[1]

Rice.

Rice is an important article of food in most of the colonies, especially in British Guiana and Trinidad, where East Indian coolies form an appreciable portion of the population. A remarkable development in rice-growing has taken place in recent years in British Guiana. The industry is almost entirely in the hands of East Indians. The long-grained varieties are most in favour. There are acclimatized varieties of rice known as 'Creole' and 'Berbice Creole' which have proved both hardy and productive. The rapid extension of the industry is largely due to this fact. In addition, over two hundred of the best varieties from other rice-growing countries have been introduced and submitted to careful trials as against the Creole sorts. New varieties have been raised by the Department of Agriculture by cross-breeding and selection. Some of the latter are most promising, indicating increase in yield of over thirty per cent. as compared with the standard varieties. Rice of two qualities are turned out at the central mills in Georgetown: (1) a brown rice prepared by steeping the paddy before it is milled, and (2) a pure white rice. The brown rice is regarded as the more nutritious. Rice meal is shipped and a cattle food called 'calco' made from the fine rice husks and rice 'ends' soaked in molasses. The total area under rice cultivation in British Guiana is 38,000

[1] Sea Island cotton exported from the West Indies, October 1, 1910, to September 30, 1911:

Colony.	*Weight.*	*Estimated value.*
	lb.	£.
Barbados	726,573	42,346
St. Vincent	558,786	44,237
Montserrat	404,733	30,362
Nevis	344,395	24,603
St. Kitts	329,322	24,067
Anguilla	148,595	10,207
Antigua	96,992	6,795
Virgin Islands	50,337	3,180
Trinidad and Tobago	6,056	456
Grenada and Carriacou	274,224	10,205
	2,940,013	£196,458

acres. The progress of the industry may be realized from the fact that while in 1895 the importations of rice from India amounted to 34,000,000 pounds, of the value of £142,000, they have been gradually reduced until in 1912 they were only a little over 500,000 pounds, of the value of £2,807. In addition to meeting local requirements, over 12,000,000 pounds of rice were exported in 1910 to the neighbouring colonies, of the value of £68,000.

The cultivation of rice is also extending in Trinidad, where 11,000 acres are under this crop. Jamaica is another colony possessed of land suited for rice-growing. The important factors leading to a successful rice industry in the West Indies are (1) the existence of large areas of low lands furnished with a reliable water-supply, and (2) the presence of an appreciable population of East Indians possessed of a practical knowledge of rice-growing. Under such circumstances the industry is capable of very considerable extension, and it is not unlikely in the near future to become of great commercial importance. As showing the very considerable demand for rice still existing in the West Indies the following particulars are quoted for the year 1911–12: Jamaica imported 13,000,000 pounds, of the value of £65,037; Barbados, 16,000,000 pounds, of the value of £95,621; and Trinidad, 27,000,000 pounds, of the value of £136,989. The total quantity of rice imported into the three colonies in the year 1911–12 amounted to 56,000,000 pounds, of the value of £297,647.

Rubber and balata.

With the exception of the larger colonies rubber cultivation is not likely to develop into an important industry in the West Indies. There are, however, good prospects for rubber cultivation in British Honduras, British Guiana, Trinidad, and probably also in Jamaica. A large area of Cohune ridge, in British Honduras, is admirably adapted for rubber-growing. In British Guiana, in wide districts bordering on the numerous rivers, rubber trees are likely to thrive under favourable conditions. In the Handbook for 1913 it is stated that 'there are 10,880,000 acres of easily accessible lands, of which fully 9,000,000

acres are unalienated from the Crown. Of this vast area a very large proportion is eminently suited for the cultivation of Para rubber.' In 1911–12 there were 2,252 acres planted with rubber trees. Since 1909 the Government have imported large quantities of Para rubber seed, and obtained a germination of over eighty per cent. Tapping of Para rubber has commenced on two estates on the Demerara River. At the Issorora Experiment Station 'over one-fourth of the total number of Para rubber trees at four years old were of sufficient size for tapping and the yields were satisfactory'.

British Guiana has exported rubber of the value of £7,000 and Tobago has begun to make commercial shipments of the value of £1,388. There is a distinct tendency in late years to confine the cultivation to Para rubber, and to pay less attention than formerly to the Castilloa or central American rubber. It is not improbable that when rubber prices fall the greater cost of labour in the West Indies as compared with Malay and Ceylon may become the controlling factor as to the ultimate development of rubber-growing in the West Indies.

A native gutta-percha known as balata is the third most important industry in British Guiana. It is a forest product prepared from the latex of *Mimusops globosa*, a tree found widely dispersed over the lower lands along the banks of the smaller rivers and creeks, especially in the Canje district of Berbice. When first tapped each tree yields an average of one gallon of latex, equal to five pounds of dry balata. The industry is regulated by a system of licences, and no tree is allowed to be tapped which does not measure thirty-six inches in girth at four feet from the ground. The exports of balata have steadily increased from British Guiana in recent years as shown in the following table:

Period.	*Total for Five Years.*	*Average Export per year.*	*Average Value per year.*
	lb.	*lb.*	*£.*
1893–1897	1,133,123	226,625	12,105
1898–1902	2,009,783	401,956	21,955
1903–1907	2,488,951	497,790	46,186
1908–1912	5,376,079	1075,216	110,465

The tree yielding balata is also found in Trinidad, but apparently it is not largely tapped in that island. In the trade returns of Trinidad for the year 1911 balata in transit, probably from Venezuela, is shown among the exports to the value of £476,861.

Arrowroot and starch.

The island of St. Vincent is one of the chief sources of the supply of arrowroot, and for a long time after the decline of sugar it was the principal source of revenue. In recent years cotton has taken a leading place. Although Bermuda arrowroot is regarded as the best, it is produced in such small quantity (about 174 cwt. per annum) that it is negligible from a commercial point of view. The annual exports of arrowroot from St. Vincent are 5,000,000 pounds, of the value of £30,000. A good price is at the rate of 2½*d.* to 3*d.* per pound. It is claimed 'that St. Vincent arrowroot is unrivalled, not only as an article of diet for invalids and children, but also in the manufacture of chocolate and for general starch purposes'. The volcanic soil and the equable rainfall of St. Vincent are exceptionally favourable to the successful cultivation of arrowroot (Plate XXXII).

Experiments are being carried on at Jamaica and Dominica with the view of producing cassava starch and crude cassava meal on a commercial scale. The cassava root in Jamaica is stated to contain 33 per cent. of starch, as compared with 16 per cent. in the potato. An average return of ten tons of roots per acre is regarded as obtainable under good cultivation. In Dominica eight tons per acre is regarded as a fair average. It is anticipated that a favourable market will be found in Canada for cassava meal and starch.

Tobacco.

Tobacco is only produced on a commercial scale in Jamaica. The area under tobacco is about 804 acres, and the exports of tobacco (including leaf tobacco, cigars, and cigarettes) in 1911 amounted in value to £40,005. The cultivation of tobacco is carried on for the most part by Cuban settlers, who occupy small holdings of a few acres each, and devote their whole time and attention to the care of the plants and the subsequent preparation

and curing of the crop. There are several cigar factories in Kingston. The high character of the best Jamaica cigars is well recognized in this country.

Other products.

In addition to the above, the West Indies produce other agricultural commodities of hardly less importance. Mention might be made of coffee of the yearly value of £167,409, honey and beeswax of the value of £23,505, pimento, or allspice, of the value of £73,660, logwood and logwood extract of the value of £229,818, and fustic and bitter-wood of the value of £15,682 exported from Jamaica. Chicle gum (for chewing purposes in the United States) of the value of £198,678 is exported from British Honduras. Lily bulbs, spring onions, and other vegetables are exported from Bermuda to the United States of the annual value of £86,608. Grenada, the spice island of the West Indies, exports nutmegs, mace, and cloves of the yearly value of £20,000. The Bahamas export, besides sponges of the value of £111,381, sisal hemp of the value of £44,855, native lumber of the value of £31,496, fruit and vegetables of the value of £9,176, and conch shells and turtle of the value of £6,405. Crops of yams, tanias, maize or Indian corn, ground-nuts, beans, various peas, sweet potatoes, cassava, arrowroot, and bread-fruit, are grown on a large scale in all the colonies, but with the exception of yams and sweet potatoes, exported to the Panama Canal zone, they are chiefly used for local consumption.

Pastoral industries.

The number of domesticated stock existing in the West Indies, considering the area, is not large. This is accounted for by the fact that the best lands are occupied by such extensive agricultural crops as sugar, cacao, and fruit. Nevertheless, in the aggregate, the horses, cattle, and small stock are of considerable value. Jamaica is noted for its pen-keeping (for rearing horses, mules, and cattle) and its dairying. There are about 300 grazing pens, with over 100 head of cattle each. The total number of horned stock in the pens in 1912 was 117,646. Some of the larger grazing pens contain from 1,040 to 3,380 head of cattle. The number of horse-kind in the

island in 1912 was 56,917 ; sheep, 12,373 ; pigs, 31,116 ; asses, 21,740. The exports of cattle and horses in 1911 were of the value of £6,346. The area returned under the useful and nutritious Guinea grass (*Panicum jumentorum*) is 143,592 acres. Good horses, especially polo ponies, are bred in Jamaica. The government and the local agricultural society encourage the introduction of sires for the improved breeding of stock, and a school-farm with 250 head of stock has been established at Hope, near Kingston. The Director of Agriculture reported that in March 1912 there were 43 pedigree red-polls, 19 pedigree Jerseys, and 15 Canadian dairy cows and heifers in good health and condition at the farm. Of these 82 dairy-bred heifers by pedigree Jersey, Guernsey, shorthorn, and red-poll bulls had been reared during the past three years ; 122 foals had been produced from the imported thoroughbred stallion 'Water Jacket', and 41 pedigree boars and 36 shoals of the British large black breed of pigs had been distributed through the island.

Cattle

Many breeds of Indian cattle have been introduced from time to time to Jamaica, and are much valued on account of their hardiness and suitability to the climate for draught purposes. It is stated 'that Indian cattle surpass all others and are best suited for all classes of work'. Several English breeds have been found suitable. Hereford cattle have done well and are splendid beef animals ; shorthorns, where the feeding is good, are valuable for beef and milk ; in some districts Devons are considered the most hardy of English breeds for general working purposes.

In spite of the existence of extensive savannas, some of which might be utilized for cattle-raising, Trinidad is largely dependent for its animal food (with the exception of small stock and poultry) on shipments from Venezuela. The horned cattle imported in 1911 were 8,253, of the value of £48,064. A government farm has been maintained for many years for the improvement of Indian and other working cattle, and dairying. In addition to supplying local requirements, the neighbouring colonies

have also benefited by being able to obtain pedigree cattle, and small stock from the Trinidad farm.

In British Guiana, in addition to practically meeting home requirements, cattle are exported to Dutch Guiana. Cattle are also raised on the extensive savanna tracts in the far interior. These are exported to Brazil, as suitable transport facilities are not available for bringing them down to Georgetown and the coast districts. In recent years the Department of Science and Agriculture and the Board of Agriculture have devoted attention to the introduction of improved breeds of cattle and horses and small stock. The Board of Agriculture returns publish the following summary of domestic animals in the colony: cattle 81,500, sheep 19,500, goats 11,170; horses 2,650, donkeys 5,370, swine 17,000. A government stock-farm is maintained in connexion with the Onderneeming school.

In the smaller islands the Imperial Department of Agriculture, from 1900 to 1909, maintained stud-farms in connexion with the agricultural schools at St. Vincent, St. Lucia, Dominica, and Antigua, and encouraged the keeping of brood-mares, milking cows, and small stock amongst the peasantry. It also introduced numerous selected animals for breeding purposes, and employed a bee expert to advise as to the successful production of honey and wax.

Settlement

The Toledo Settlement, British Honduras.

Many attempts have been made in the West Indies to establish colonies of Europeans as settlers to engage in agricultural pursuits. In British Honduras, after the civil war in the Southern States, a number of families settled on lands about a mile north of the Carib village of Punta Corda in the southern portion of the colony. This was known as the Toledo Settlement. One hundred arrived in the first steamer in 1868, and 200 more in the following year. They built houses, constructed four miles of road and a wharf, dug wells, and resolutely set to work to clear the land and plant it. The result of the experiment was watched with great interest. Although it is generally considered that the white man is not suited

for laborious work in the tropics, and that it is more conducive to his interests to possess capital and secure the services of the negro or coolie for field work, yet it was possible in this instance for the white settlers at Toledo with little or no capital to turn a wild tropical forest into a number of thriving homesteads. Most of the settlers grew sugar-canes and made muscovado sugar of superior quality, which was sold locally at prices ranging from 5½ cents to 6 cents per pound. In addition to cultivating sugar some of the settlers raised cattle, a rich pasture being formed naturally after the forest was cut down and cleared. After passing through various vicissitudes, the settlement in 1882 was reduced to fourteen families. Little was heard of it in later years. Probably by this time all the original settlers have either died or returned to the States. The experiment, though it started well, was doomed to failure. Several attempts were made to colonize with whites—German and others—in Jamaica. According to Cundall, 'the communities have almost always either dispersed or been immersed in the native race. The failure is not to be put down to the heat entirely. . . . It is in a great measure due to uncongenial surroundings, which too often lead to drink and other evils.'

White labourers in Barbados.

It is mentioned in the early records of Barbados that 'white servants (as labourers) were the mainstay of the colony until the development of the sugar industry fostered the importation of negro slavery'. White servants in those days were for the most part persons who came out under an indenture of service or were prisoners of civil war, shipped to be sold in the colony. A small remnant still survives at Barbados. Governor Rawson, reporting on the decrease of the white population in Barbados, says, 'the reduction in 1871 may be attributed chiefly to the decrease in that class of whites, who in the time of slavery were attached as militia tenants to the estates, and who after the emancipation found some employment on them, while others emigrated or became small shopkeepers or freighters; but the larger portion who failed to find such employment on the estates have sunk in the

social scale—living in poverty and squalor—and are known by the name of "poor whites", or in the Scotland district as "red legs".'

Having briefly referred to attempts to establish settlements of white people on lands in the West Indies, it is desirable to mention the results in recent years to encourage peasant settlements among the black and coloured people.

Peasant settlements: Jamaica.

In Jamaica there exists a larger body of negro landholders than possibly in any other portion of the West Indies. The number is variously estimated at from 90,000 to 100,000. In the official returns 'holdings of and under £40 each in value number 124,642 and contribute £12,200 to the property tax'. In the majority of cases, owing to the excellent system of employing travelling agricultural instructors and training the teachers in the elements of practical agriculture, the peasant holdings in Jamaica are well cultivated and yield good results.

St. Vincent.

In some of the Lesser Antilles where, owing to the decline of the sugar industry, the labouring population had lost their principal means of support, the Royal Commission of 1897 recommended that steps be taken to acquire some of the unused sugar estates and establish a peasant proprietary scheme. Owing to the special condition existing in the island of St. Vincent a grant of £15,000 was made by the Imperial Government in 1899 for the purchase of certain areas for allotment in small holdings of about five, but not exceeding ten, acres each. In selecting applicants for allotments priority was given to those prepared to pay 25 per cent. of the value of the lot; the remainder of the money was to be paid—after an interval of five years—in twelve annual instalments, together with interest on the balance at 3 per cent. per annum. Other applicants, if considered eligible, were to pay at the end of the first year one-sixteenth part of the purchase money and the remainder in annual instalments with interest at 3 per cent. on the money outstanding at the end of each year. Every purchaser was required to reside on his allotment and carry on his cultivation under the guidance of the officers of the

Imperial Department of Agriculture. In the event of failure to comply with the conditions laid down the allottee would forfeit his claim to the land and house, if any, and to all crops and instalments paid.

The total area purchased and settled amounted to 5,060 acres at a cost of £11,277. The number of rural lots sold was 581, and the number of township lots 416. In a statement of receipts and expenditure to December 31, 1910, the receipts (including the government grant of £15,000) amounted to £30,025 and the expenditure to £27,561.

Numerous roads were constructed leading to the settlements, and bridges were constructed, where necessary, to afford facilities for bringing the produce to market. Considerable areas were planted in cassava, maize, or Indian corn, pigeon peas, ground-nuts, and other food crops. For the surplus produce the cultivators have found a ready market in Trinidad and Grenada; while in Trinidad and Barbados they have been able to dispose of small stock, poultry, and cattle. After the introduction of Sea Island cotton in 1904, about 290 acres have been planted on the holdings. 'Largely owing to the advice given by the agricultural instructors, the yield of cotton per acre each year has been satisfactory. It is estimated that the value of the season's crop in 1910 exceeded £3,000, giving a gross value of over £10 per acre.'

Summary of results of settlement in St. Vincent.

In a report on the administration of the Road and Land Settlement Fund at St. Vincent, presented to Parliament, July 1911 (Cd 5,742), the following summary of the results of this interesting experiment is given: 'That the material welfare of the colony, as a whole, has improved since the year 1897 is a fact about which there is no room for doubt, and there is every indication that the march of progress will continue. How much of this increased prosperity is due to the land settlement scheme is a question to which it would be impossible to give a definite answer. But this much at least can be asserted with confidence, the condition of the native population has emerged from that extremely critical state which the Royal Commissioners found to exist when they visited the island in 1897.

Since the decay of the sugar industry, private enterprise has, it is true, established other industries on a sufficiently large scale to afford employment to a great number of the native population. At the same time, the existence of a class of peasant proprietors must necessarily have a beneficial effect both on those who have taken advantage of the scheme, and also on the general welfare of the island. Land which formerly was ill cultivated, or not cultivated at all, is now yielding a rich return, and certain estates round the coast, which before lay almost fallow in the hands of private owners, have been bought by the State and re-sold to an agricultural class. It would be impossible to compare the condition of St. Vincent to-day with that of twelve years ago without a sincere feeling of gratitude for the much-needed assistance which the parliamentary grant has given, not only to those whose condition it was primarily meant to benefit, but also to the progress and prosperity of the colony as a whole.'

Carriacou. Encouraged by the results achieved at St. Vincent, a somewhat similar scheme has been adopted in the small island of Carriacou, a dependency of Grenada. In the report in the Blue Book for 1911 the results are given as follows: 'The Carriacou Land Settlement Scheme continues in a flourishing condition, and it is not too much to say that by its operation this interesting and valuable dependency has in less than nine years been brought from desolation to comparative affluence. The total area so far dealt with is 1,510 acres, of which 1,089 acres have been allotted in 393 lots, leaving reserves (chiefly forest) of 421 acres. The total amount advanced from colonial revenue has been £8,450, of which only £950 was outstanding at March 31, 1912. An earnest demand is now being made by other peasants there, willing and anxious to become landowners under similar auspices, and the extension of the scheme is receiving the careful consideration of the Government.'

Grenada. Two small peasant settlements are in course of being established at Grenada, and a third, containing 300 acres, was started in January 1912.

Manufactures and Economic Products

The principal manufactures in the West Indies are those associated with the sugar industry and such by-products as rum and molasses. In the larger colonies the sugar factories are well equipped, and are being steadily improved and enlarged. Centralization has been carried out with the view of economy and securing the best market for the produce. For instance, in British Guiana in 1882 there were 106 sugar factories ; in 1912 they had been reduced to 39 without any diminution in the out-put. Similar steps are being taken elsewhere. In Jamaica the governor reports 'much improvement in the manufacture of sugar has been secured by the introduction of modern machinery ; while the centralization of contiguous estates is proving a successful means of increasing the out-put of sugar'. Two central sugar factories are in successful operation at Antigua, and a large central factory, capable of producing 10,000 tons of sugar, was erected in St. Kitts in 1911. At Barbados, where the conditions are of a special character, there are 332 large and small sugar plantations; of these 107 have steam power, the remainder depend on wind power. Factories for the manufacture of biscuits are established at Jamaica, British Guiana, and Barbados. Iron-work foundries and two boot and shoe factories exist in British Guiana. A government floating dock and a workshop are in successful operation at Trinidad. Chemical manure works and a sulphuric acid factory are established at Barbados. In the Bahamas there are two pineapple canning factories, several sisal factories and a lumber-mill at Whale Cay. Manufactures connected with sugar industry.

The chief mining operations are carried on in connexion with gold and diamonds in British Guiana. The gold industry was started about 1884. From that date the gold production steadily increased until 1893–4, when it reached a maximum output of 138,528 oz. In later years it has somewhat declined. The gold-bearing areas are widely distributed throughout the colony; the districts where mining has been chiefly carried on are those Mining.

adjoining the Essequibo River and its tributaries, the Mazaruni, the Barima, and the upper Demerara rivers. The most valuable goldfield for its size is at Omai, on the left bank of the Essequibo River, where 95,000 oz. were obtained from an area of about 60 acres. A large proportion of the gold has been obtained from alluvial washings in placers by the 'tom' and 'sluice'. In 1890 several companies were formed to work gold reefs that had been discovered on the Demerara and Barima rivers. Auriferous quartz has been successfully worked for brief periods, but according to the Handbook of 1913, 'all the quartz mines are, at present, closed down.'

The following is the amount of gold recorded at the Department of Lands and Mines in 1884–1912 :

	oz.
1884–1905	1,756,630
1905–1906	94,363
1906–1907	85,505
1907–1908	67,209
1908–1909	73,655
1909–1910	64,830
1910–1911	54,989
1911–1912	50,274
Total	2,247,455

The value of the above was £8,193,845.

Fine gold occurs in certain localities, but, as a rule, the gold obtained in the colony is coarse and nuggety. The largest nuggets have been one of 333 oz. from the Five Stars Districts in the Upper Barima River, and one of 111½ oz. from Tiger Creek, Potaro.

Diamonds.

Diamond mining was started in British Guiana about 1890 in the Upper Mazaruni River, at Putareng Creek, and is still being carried on in the district. Diamonds have also been found around the Kuribrong and Cuyuni rivers. The stones are obtained by washing the gravel by 'sluicing' as for gold. The following is the production of diamonds in 1907–12 :

	Carats.
1907–1908	2,121
1908–1909	5,617
1909–1910	7,180
1910–1911	3,035
1911–1912	7,647

The stones are of good quality and run on an average from ten to fifteen to the carat. Some large stones have been found, including two weighing 12¼ and 12½ carats each.

The administration of the gold and diamond fields is under the Department of Lands and Mines. The royalty on gold is 70 cents (2*s.* 11*d.*) per oz. Diamonds found on prospection pay a royalty of 10 per cent. on their value. All gold, silver, and diamonds must be reported on arrival in Georgetown at the Department of Lands and Mines.

Petroleum oil fields: Trinidad.

As indicated in the section on Geology, the existence of petroleum in the West Indies has been known for a long period, but until quite recently no organized attempts had been made to discover the localities where the oil was capable of being obtained in large quantity under favourable conditions. The West Indian oil-fields occur in Tertiary strata. Those of Trinidad are in the southern portions of the island, and, according to Professor Codman, occur in rocks of a depth of 6,000 to 6,500 feet containing many oil horizons, of which three distinct zones have already been located. For the conservation of petroleum oil three conditions are necessary, namely, ' material from which the oil can be formed by chemical processes, strata of sufficient porosity to retain the oil, and impervious strata to seal up the oil.' All these conditions are present in the strata of Trinidad. Further, in order to concentrate the oil, suitable geological structure of the rocks is essential. Owing to the earth-movements that have taken place in the southern districts of Trinidad, the rocks have been thrown into a series of folds or ' anticlines '. There are three of these anticlines, which run almost parallel to the southern coast and stretch in a northerly direction from San Fernando to the eastern coast. As a manifestation of petroleum, the Pitch Lake of Trinidad is well known. It is a remarkable deposit of asphalt, with an area of 127 acres and an estimated capacity of not less than 10,000,000 tons. About 1,500,000 tons have already been removed for use

as paving material in the United States and in Europe. On this the government of Trinidad has received in recent years royalties amounting to £400,000. Besides the natural asphalt, another quality, from which all the water (about 25 per cent.) has been eliminated, known as epuré, is also exported. The asphalt exported from Trinidad in recent years is as follows :

	Quantities. *Tons.*	*Value.* £.
1897–1902	665,210	741,859
1903–1907	669,877	780,119
1908–1911	766,334	850,342

Manjak. Another product of petroleum is ' manjak ', a solid friable bitumen resembling cannel coal occurring in veins. This has been derived from heavy petroleum traversing fissures in clay, leaving only a solid mass. There are ' manjak ' or glance-pitch mines at Barbados. About 174 tons, of the value of £1,306, were exported in 1910. A similar product is exported in small quantities from Trinidad.

Extent of oil-bearing territory. According to the late government geologist, Mr. E. H. Cunningham-Craig, F.G.S., ' a geological survey of Trinidad has shown that about 600 square miles are in oil-bearing territory, and that much more easily accessible and economically workable oil-fields existed in other parts of the colony.' Writing later, Mr. Cunningham-Craig states : ' There are many different grades of petroleum to be obtained in the island. The youngest oil-sands, known as the La Brea oil-bearing group, yield a heavy asphaltic oil, which has been used largely as fuel, and as a road dressing after the separation of the lighter fractions. It contains an appreciable percentage of sulphur. The Rio Blanco oil-sands yield a more valuable product, with higher percentage of petrol and kerosene, and under certain conditions, as proved by the South Naparima Oil Company, a very valuable oil can be obtained from these beds. The percentage of sulphur is so minute as to be negligible. A much older oil-bearing horizon, the Galeota oil-sands, has also yielded a fairly light asphaltic oil. Between the two latter horizons

thinner and less widely distributed oil-rocks are known; it is among these that the paraffin oils are found.'

Several companies have been started, and although, as was anticipated, some have not been successful from want of funds and other circumstances, there can be no doubt that oil has been struck 'in great quantity in seven different and widely separated districts'. Some of the difficulties met have been due to the fact that the wells have 'sanded up' so rapidly it has been impossible to produce the oil steadily or maintain regular production. One company that started operations in 1907 obtained a production of oil at the rate of 600 to 700 barrels per day from comparatively shallow borings. The sanding up of the wells caused a check for some time. At present, after boring into a lower stratum, the production is so satisfactory that it is anticipated the enterprise will prove one of the most successful in Trinidad.

Another company drilled in October 1912, and 'a twelve and one-half inch casing was placed in the bore and cemented at 707 feet to shut off surface water, a ten-inch casing at 1,422 feet, and six-inch casing at 1,606 feet. The top of the oil-sands was found at 1,484 feet, and they were penetrated to a depth of 122 feet, though it was believed that there were other productive layers not yet entered when the flow of oil interrupted operations. A great flow began on November 26 at the rate of 10,000 barrels daily. Between 15,000 and 30,000 barrels were lost owing to lack of local storage, pump, and pipe-line facilities adequate for collecting and transporting so unexpectedly large a yield.' The well continued to flow uninterruptedly to April 1913, when its rate was about 300 barrels per day. One hundred thousand barrels of oil from this well were placed in storage tanks ready for shipment.

The problems that have to be worked out in Trinidad in order to place operations for oil on a paying basis are said to be three in number, namely: (*a*) finding a sufficient supply of oil under conditions making for permanency within reasonable limits; (*b*) the complete

equipment of each well against the severe gas pressure hitherto met with; and (c) the selection of a method to establish the flow of oil so that it will not be retarded or stopped by sand. These problems are all in course of being gradually solved. The total production of the company referred to for the year ending January 31, 1913, was 247,208 barrels, or an average of 675 barrels per day.

Position of Trinidad oil industry in 1910–12.

A good deal of pioneering work has been done at Trinidad since 1910; huge storage tanks have been erected, pipe-lines have been laid, and oil has been shipped amounting to several million gallons. Heavier drill-pipes, heavier pumps and hose, and pipes sufficiently strong to oppose the tremendous gas pressure by increased water pressure are in course of being provided for future use.

Mr. Cunningham-Craig states that, in spite of the difficulties hitherto experienced and the large sums of money already expended with only moderate results, he is in a position 'to predict with confidence a successful future for West Indian petroleum'.

Reviewing the position of the oil industry in Trinidad in 1911–12, the Colonial Secretary quotes the Inspector of Mines as stating that, 'taken generally, the progress of the petroleum industry has not been satisfactory during the year. This was due to the under capitalization of several companies operating in the island and to other causes over which the Government had no control.' It is not improbable that an amalgamation of some of the companies already existing and the introduction of larger oil interests will tend to improve the prospects in Trinidad, and enable the industry to assume more stable conditions.

Agreements between oil syndicates and British Government.

An important statement was made in Parliament by Mr. Harcourt, the Secretary of State for the Colonies, on July 31, 1913, in reference to the position of the petroleum industry in Trinidad. The following extracts contain the chief points of interest: 'Two years ago the first shipment of crude oil was made from Trinidad of 3,500 tons. By the end of March last the total produc-

tion had risen from 202,000 barrels in 1911 to 880,000 barrels, the production for the month of March being 44,500 barrels. At that time seven companies were producing oil, and eight others had been closed down for various reasons. The inadequate production of oil, and the slow development of the industry, have been matters of great anxiety to the Colonial Office and the Admiralty —to the Colonial Office, primarily for the benefit of the colony ; to the Admiralty, for the purposes of the navy ; and to both, for the modern development of oceanic and Imperial trade. . . . We have lately made an agreement with a group representing several important interests in the oil industry. It is called the British West Indies Petroleum Syndicate. Several important British companies, including the Burmah Oil Company and the Anglo-Persian Oil Company, are interested in this syndicate, and only one-fourth of the capital is held by the British Company, which is controlled by the Shell. I am on the point of making an agreement with another important group, representing different but still British interests. They will take over several properties in the island, including one large area on which work has been closed down. I am satisfied that they will have at their disposal ample means to develop all they acquire. Both these corporations will be subject to all the conditions I just now specified as to British control and naval pre-emption, with special clauses as to continuous and active development.'

Oil in Barbados.

Reference has already been made to the possibility of developing an oil industry in Barbados. The presence of petroleum, or 'green tar', was referred to by Schomburgh in 1847. Mr. Beeby Thompson states there is no doubt of the existence of high-grade petroleum at Barbados, as the oil-beds may be observed out-cropping in the Scotland district, and a small production has occasionally been obtained from drilled wells by the Hon. A. C. Ponsonby and others. It is probable that the steps lately taken to secure a geological exploration of the island will be crowned with success. Recently a Bill has

been passed by the legislature authorizing a company to construct and maintain a fuel-oil supply-station at Barbados. Section 13 of the Bill confers on the company the exclusive right of supplying oil for fuel to vessels for twenty-five years, but this provision does not affect in any way the oil produced in the island itself. An oil-bunkering station is proposed to be established also at St. Lucia.

Trade, Commerce, and Transport

Trade relations between Canada and the West Indies.

Proposals for commercial reciprocity between Canada and the British West Indies were under consideration for many years. In 1890 Mr. Foster, then Minister of Finance in the Dominion, visited the West Indies with that object. In 1898 the Canadian preferential tariff which had already been granted to the United Kingdom was extended to the West Indies. It was recognized by the Canadian Government that there were large opportunities for the development of trade between Canada and the West Indies, which they regarded as the natural customers of the Dominion. As the West Indies were then suffering from a very severe depression, Mr. Fielding, the finance minister, claimed that Canada had some Imperial responsibilities in the matter, and with the view of assisting Her Majesty's Government, it was decided to extend the preferential tariff to the West Indies without asking any concessions in return. Under the preference thus granted the produce of the West Indian colonies was entitled on importation to Canada to a reduction of 25 per cent. on the import duty. This was afterwards raised to 33½ per cent. It was at the same time provided that raw sugar, when imported from any British possession, could be entered at the British preferential rates. Refined sugar would be entitled to the same privileges provided the raw sugar from which it was made was grown in a British possession. From 1898 to 1903 the effect of the preference was not appreciable, as there still was a favourable market in the United States, but in the latter year a considerable change took place

due to the adoption of the Brussels Convention. This led to the abolition of bounties on European beet sugar and to its admission into the United States free of the countervailing duty hitherto imposed upon it. The West Indian sugar having thus lost its favoured market in the United States was in a position to take full advantage of the Canadian preference.

Another factor still further improved the prospects in Canada; this was the imposition of a surtax on sugar imported from Germany. As a result beet sugar imported from Germany was almost entirely shut out from the Canadian market. The effect of these changes was soon shown in the statistics of the sugar imported into Canada. The importations from the West Indies in 1897 did not exceed 11,000 tons; in 1903 they had reached 50,000 tons; but in the year 1909 they had reached a total of 133,000 tons of the value of £756,206, or 60 per cent. of the total production of all the West Indian colonies.

Negotiations in 1904–8.

The attention thus drawn to the Canadian market led to a renewal of the proposals for a reciprocal arrangement between Canada and the West Indies. In British Guiana in 1903, and in Trinidad in 1904, steps were taken in that direction, but with no practical result. As a consequence of efforts made by the Imperial Department of Agriculture, the Boards of Trade of Toronto, Halifax, and St. John sent a Commission of three delegates to the West Indies to study trade conditions. The report which followed was of considerable interest and value. In the same year the Imperial Commission of Agriculture initiated a more general movement, which resulted in the assembling of a conference at Barbados in January 1908 to consider the steps that might be taken to encourage more intimate trade relations with Canada. This conference was attended by representatives of all the West Indian colonies. The Dominion Government also was represented by two delegates. Resolutions were adopted in favour of entering into negotiations for reciprocal tariff concessions, for the establishment of an improved and cheaper telegraphic communication, and for increased

transportation facilities, both by a service of steamers to the West Indies and by rail in Canada.

Royal Commission of 1909.

The next step, which eventually led to the appointment of the Royal Commission, was taken by the Canadian Government, which, in view of the difficulties foreseen in the conclusion of separate reciprocity agreements with the several West Indian colonies, proposed in a Report of the Committee of the Privy Council that the whole subject should be further considered by a conference, organized by Imperial authority in the form of a Royal Commission or otherwise. The Royal Commission was appointed in 1909 with Lord Balfour of Burleigh as chairman, and two Canadian ministers among its members.

The Commissioners, after careful consideration of all the facts placed before them at sittings in Canada and the West Indies, reported (paragraph 32): 'It cannot be denied that the remarkable development of the Canadian market for West Indian sugar, at a time when its practical exclusion from the United States had been becoming apparent, had been of real service in averting that abandonment of sugar cultivation, with its attendant ill-effects on the condition of the labouring classes, which the Commission of 1897 foresaw and dreaded. It appears to be of capital importance to secure by all reasonable precautions that the Canadian market shall not be lost.'

General view of economic development of the West Indies.

The Commissioners were sensible of the danger of dependence on a single industry, and strongly supported a continuance of the efforts that had been made with such signal success to develop other industries suitable to the climate and soil of the West Indies. At the same time it was recognized that the sugar industry was still the dominating factor in such colonies as British Guiana, Barbados, St. Lucia, Antigua, and St. Kitts. It was encouraging to find that in colonies where the natural conditions were favourable for sugar growing, recent events had tended to place the industry on a surer foundation. Slightly higher prices and more assured markets had brought improved credit, with the result

that the central factory system was extended everywhere, and more scientific methods of cultivation, including the use of artificial and other manures, and new and improved varieties of sugar canes were being adopted in all the colonies. Attention was also drawn by the Commissioners to the extensive tracts of cultivable land still awaiting development in colonies such as British Guiana, British Honduras, Jamaica, and Trinidad. Where native labour was not available for developing new agricultural industries it was pointed out that a well-organized system of immigration, which had been in satisfactory working for many years, was carried on with the co-operation of the government of India. In this development Canada, no less than the West Indies, was directly interested, as it would lead in the natural course of events to a greater demand for Canadian food-supplies and other goods.

Agreement between the West Indies and Canada, 1913.

The draft agreement between the West Indies and Canada was signed at Ottawa on April 9, 1912. It was afterwards ratified by the Canadian Parliament ('West Indian Trade Agreement Act, 1913') and by the several colonies in the West Indies, with the exception of Jamaica and the non-sugar colonies of British Honduras, the Bahamas, and Bermuda. It came into force on June 8, 1913. In view of the withdrawal of Great Britain from the Brussels Convention and the possible return in some form or other of the continental bounties and cartels, it is generally acknowledged that the West Indies were fully justified in the action they had taken after full consideration of all the circumstances.

With regard to sugar, under the agreement the duty on foreign 96 test was reduced from 83½ cents to 57½ cents, and on British from 52½ cents to 40¾ cents, while on foreign refined the reduction was from $1·26 to $1·08, and on British from 84 cents to 83 cents. The privilege hitherto given to the refiners of importing 20 per cent. of their meltings from foreign sources on the terms of the British preferential tariff was withdrawn; but the refiners were compensated by the reduction in the duty on raw sugar, which was greater than on the refined, and

increases their protection from 31½ to 42¼ cents (*West India Committee Circular*, May 20, 1913).

Improvement of communications.

The improved steam communication recommended by the Royal Commission between Canada and the West Indies was not immediately realized in full; there were difficulties in the way, and for the present the West Indies must be satisfied with the new contract, in spite of its many disadvantages. In regard to improved telegraphic communication the recommendations of the Royal Commission have been largely adopted.

Trade relations with United Kingdom.

As already shown, the only industries of importance in the West Indies are those of an agricultural character, and almost wholly in commodities for exportation. From an early period in their history the commerce between the Colonies and Great Britain assumed considerable importance. It is not improbable there would have been little or no diminution in the trade between the West Indies and Great Britain but for the dislocation due to fiscal and other changes in the mother country.

An important factor in the improved condition of the West Indies is the increase of population. In 1791 the population, according to Bryan Edwards, was 521,000. In 1861 it was 1,115,000. In the fifty years from 1861 to 1911 the population has nearly doubled, and according to the latest returns is now 2,062,298. The revenue as shown in the table below[1] has increased from £2,546,724 in 1894 to £3,914,434 in 1911, while the total trade (imports

[1] *Colony.*	*Revenue.*		*Total trade.*	
	1894 £	1911 £	1894 £	1911 £
Trinidad . .	585,905	950,744	3,267,832	9,788,334[a]
Jamaica . .	813,075	1,356,092	4,113,166	5,813,620
British Guiana .	588,245	593,498	3,708,651	3,780,821
Barbados . .	160,624	221,906	2,263,845	2,545,641[a]
Windward Islands	148,186	205,476	940,955	1,395,120
Leeward Islands .	147,357	174,818	881,877	1,280,168
British Honduras	23,215	247,059[b]	515,377	1,145,463
Bermuda . .	32,475	79,249	384,424	679,573
Bahamas . .	47,646	85,592	294,347	520,346
Total .	£2,546,724	£3,914,434	£16,370,474	£26,949,086

[a] Including transit trade. [b] Including receipts from loans.

and exports) has increased from £16,370,474 in 1894 to £26,949,086 in 1911. This is an increase of 65 per cent. in revenue, and an increase in the aggregate trade of 60·5 per cent. The imports amounted to £14,023,591, and the exports to £12,925,395. Of the imports, goods to the value of £4,692,542 were received from the United Kingdom, and of the value of £9,331,049 from British colonies and foreign countries.

Of the exports, those shipped to the United Kingdom were of the value of £2,403,870 and those shipped to British colonies and foreign countries were of the value of £10,521,525. On the other hand, the all-British trade of the West Indies, in goods received from and shipped to the United Kingdom and British possessions, amounted to £11,225,275, or 42 per cent. of the aggregate trade. The exchange of commodities between the West Indies and the United States, as naturally might be expected from their relative geographical position, has assumed large dimensions. This was inevitable also, because 'New York commission houses specialized in West Indian trade, kept large stocks ready for immediate shipment, and were able to meet orders promptly; and in course of time by rendering financial aid they acquired considerable influence in the West Indies'. The total trade between the United States and the West Indies in 1911 was of the value of £7,897,813.

Canadian and other commercial connexions.

Since the grant of a preferential tariff the trade between the West Indies and Canada has assumed considerable importance, with the result that there has been some falling off in the trade hitherto carried on between the West Indies and the United States. In 1911 the exports of West Indian produce to Canada amounted to a value of £2,295,035; and the imports of Canadian goods into the West Indies amounted to a value of £1,326,110. The total trade, in 1911, was therefore of the value of £3,621,145. It has practically trebled during recent years.

Exports *per capita*.

From the preceding figures it may be gathered that the exports per head of population amount to £6 2*s*., an

appreciable increase on the return of previous years. For comparison it may be mentioned that according to an official report issued in Canada the *per capita* exports of France were £5 14*s.* 8*d.*, of Germany £5 11*s.* 6*d.*, and the United States of America £4 9*s.* 1*d.* From the aggregate trade it may be seen that each inhabitant of the West Indies contributes at the rate of £3 4*s.* per head to the trade between the West Indies and the United Kingdom, and at the rate of £5 4*s.* per head to the total British trade.

Exports: sugar and allied products.

Speaking generally, the West Indian exports have preserved their main characteristics for nearly a hundred years. Sugar, in spite of low prices ruling during the continuance of the continental bounties, still furnishes the principal exports of British Guiana, Barbados, Antigua, and St. Kitts, and in view of the recent reciprocal agreement entered into with Canada and the extension of the central factory system, it is not improbable that the sugar exports may increase in importance and value in all the colonies, and more particularly in Jamaica. Latterly, drought and disease have affected the production, but the annual output, on an average of years, may still be placed at about 220,000 tons, or the equivalent in sugar, molasses, and syrup. The export value would be well over £2,000,000. The exports of rum from Jamaica and British Guiana are of the annual value of £349,971.

A favourable market for West Indian sugar, molasses, and syrups is now offered in Canada. As little or no sugar is produced in Canada it is dependent for this commodity on other countries. The imports of raw sugar into Canada during the years 1881–1911 (at ten-years' interval) are as follows:

	Tons.
1881	62,602
1891	101,944
1901	149,530
1911	271,532

As Canada consumes more sugar than is produced in the West Indies there is an assured market for all

the production of these colonies. Some raw sugar and yellow crystals are shipped to the United Kingdom; and the United States still takes some West Indian sugar when supplies fall short from Cuba or Puerto Rico.

Cacao, fruits, &c.

The increased exports of cacao is a marked feature in West Indian trade in recent years. The exports from Trinidad, where cacao is now the leading industry, have risen in value from £439,786 in 1891 to £847,416 in 1901, and £1,230,097 in 1911. The exports have therefore nearly trebled in the last twenty years. Cacao forms practically the sole export of Grenada, and is increasing in importance in Jamaica, St. Lucia, and Dominica. The United States take the bulk of the cacao exported from Trinidad and Grenada. A fair quantity is shipped to the United Kingdom, and a share of the large exports of cacao to France, valued at £277,813, probably also reaches London. Practically all the bananas and other fruit produced in Jamaica, forming 58·3 per cent. of the total exports, of the value of over £1,500,000, find a steady market in the United States. A proposal embodied in the new Tariff Bill to place an import tax on bananas landed at American ports has since been abandoned. The Sea Island cotton produced at St. Vincent, Barbados, and the Leeward Islands of the value of £250,000 is all shipped to the United Kingdom to supply the Lancashire mills. Coco-nuts exported from Jamaica and Trinidad to the value of £220,647 find favourable markets in the United States and the United Kingdom. Fresh limes and lime products to the value of £70,790 from Dominica and £41,665 from Montserrat find a fair market in the United States, but the chief market for concentrated lime juice, citrate of lime, and essential oil of limes is in the United Kingdom. The rice exported from British Guiana of the value of £68,000 is all consumed in the neighbouring colonies. In order to illustrate the distribution of the exports of the West Indies it may be convenient to give a summary of the distribution of the produce of the four principal colonies :

Colonies.	Total Exports.	Per cent. distribution of Exports to—			
		United Kingdom.	Canada.	United States.	Other Foreign Countries.
	£				
Jamaica . .	2,948,067	14·8	8·4	62·0	14·8
British Guiana .	2,172,765	39·89	25·01	20·29	5·87
Trinidad . .	4,769,486	20·6	8·2	41·8	25·0
Barbados . .	1,005,931	11·5	48·0	7·5	1·2

Imports. As regards imports, these may conveniently be divided into three categories: (1) food, drinks, and tobacco; (2) raw materials and unmanufactured articles; (3) manufactured articles. The chief food imports comprise flour, salted fish, pickled beef and pork, pulse, rice, and tobacco. The raw material and unmanufactured articles comprise oats and other grain, material for the manufacture of soap and matches, lumber, and petroleum and other oils. Under manufactured goods are included textiles, hardware and manufactures of metal, boots, shoes, and machinery. Speaking generally, the West Indies draw their main supply of food-stuffs, such as flour, fish, salted and pickled, oats, oils, white and pine lumber from the United States and Canada, and their manufactured articles and drinks and tobacco from the United Kingdom. Bacon and ham of the best quality are imported from the United Kingdom, also tea and condensed milk. The United Kingdom is well to the fore in cotton and linen manufactures, fancy goods, silk manufactures, common soaps, spirits, wines, ales, and beer. In a number of articles, such as cordage, rubber goods, glass bottles, hardware, cutlery, jewellery, bicycles, and motor cars the United States are formidable rivals to the United Kingdom. It is interesting to note that in spite of the change of market for many classes of goods, as mentioned above, the West Indian planters continue loyal to the United Kingdom for the machinery required for their central and other sugar factories, cacao driers, and cotton-ginning machines. Every advance in this direction shows that the United Kingdom is foremost in the best manufactures of iron and steel goods. The total value of the jewellery, hardware, and cutlery, iron and steel tubes and pipes, machinery, steam-engines

and locomotives imported into the West Indies is probably not less than £1,000,000 annually. Mention may be made of the principal items of imports into the larger colonies. Their value is as follows: Cotton, linen, and woollen manufactured goods, £1,457,175; machinery, hardware, and cutlery, £822,000; wheat flours, £729,148; dried and salted fish, £479,008; lumber, £329,377; boots and shoes, £204,117; petroleum and other oils, £137,069. Condensed milk was imported into Jamaica in 1911 to the value of £53,193. Chemical manures were imported into British Guiana of the value of £133,591, and to Barbados of the value of £105,547. The sources whence the West Indies draw their principal supplies are indicated below:

Colonies.	*Imports.*	*Percentage of Imports received from—*			
		United Kingdom.	*Canada.*	*United States.*	*Other Foreign Countries.*
	£				
Jamaica . .	2,865,553	45·1	8·5	41·8	4·6
British Guiana .	1,786,574	48·49	6·48	24·69	89·6
Trinidad . .	5,018,848	37·2	7·0	29·3	19·7
Barbados . .	1,539,710	44·0	11·0	30·0	10·0

Import trade with the United Kingdom and Canada.

In the above table it is shown that the principal colonies continue to take the larger share of their imports from the mother country. It is probable that in the near future Canadian goods will figure more largely in the imports. In 1911 Canada took West Indian produce of the value of £2,295,035, and she shipped to the colonies commodities of the value of only £1,326,110. In the report on the Blue Book of British Guiana, for 1911–12, the Governor states, 'Canada continues to make headway in the local market against the United States with flour. In 1906–7 Canada supplied flour to the value of £11,800. In the 1911–12 report Canadian flour is valued at £45,349.'

In the Trinidad Report it is mentioned that there is a steady growth in the value of imports from Canada. 'It increased from £106,016 in 1909 to £190,287 in 1911, principally in fish, £64,478, flour £58,280, oats £20,473, grain £5,814, cattle food £5,017, and potatoes £4,453.'

In 1910 at Barbados the imports from Canada were of the value of £100,662. When the reciprocal trade between the West Indies and Canada is fully established, and there are improved steam communication and a cheaper telegraph service, there is no doubt that the commerce between the two countries will assume large proportions. As the West Indies is granting identical privileges to imports from the United Kingdom an increase of trade with Canada need not prove prejudicial to the trade in manufactured and other goods with the mother country. As the late Mr. Alfred Lyttelton stated in a lecture before the University of Birmingham in 1910, 'Great Britain has ministered and still ministers to the demands which might be anticipated of new countries. Such countries in the period of their development build railways, sink mines, construct roads and bridges, instil water, supply tramways, electric power and lighting stations. For these purposes it becomes necessary for them to import machinery and tools of all kinds, railway material, telegraph and electric appliances, steel-work for construction, water and gas pipes, and, of course, many other commodities necessary for the comfort and luxury of civilized life.' These remarks apply equally to the West Indian colonies as to other portions of the Empire, and the review of their trade and commerce here given shows that they continue the traditions of the past and still look to the mother country for the appliances with which to extend and strengthen their prosperity.

Transport.

Owing to their central position in the western tropics, and their accessibility by steamship communication, the West Indies are remarkably well situated for supplying the varied productions of the tropics on both sides of the Atlantic. With a thriving population of over 100,000,000 in the United States and Canada they have conveniently at hand openings for trade such as are possessed by few of the other possessions of the Empire. In addition they have extensive markets in the United Kingdom and on the continent of Europe.

The West Indies can supply an abundance of the raw

material to meet the demands of temperate countries, and in return they are able to obtain the food-stuffs, lumber, and manufactured goods so necessary for their welfare. It is anticipated that the opening of the Panama Canal will tend to increase the importance of these colonies, and still further assist in their development by widely extending the facilities for transport. Jamaica has been aptly described by Captain Mahan as, 'certainly the most important single position in the Caribbean Sea'. The other colonies also will grow in importance and value as the commerce of the world, in which British ships take so large a share, will be constantly passing their doors.

Shipping.

The West Indies have been in regular and close communication with the mother country by means of the Royal Mail Steam Packet Company for over seventy years. The company was incorporated by Royal Charter in 1839. The transatlantic steamers of the company are under contract with the home government, calling at Barbados, Trinidad, Colon, Jamaica, and New York. The voyage from Southampton to New York covers 7,150 miles, and occupies twenty-six days. From Southampton to Barbados takes twelve days. Trinidad is the junction for the intercolonial steamers, and passengers, mails, and cargo are transhipped there for British Guiana to the south, and the Windward and Leeward Islands to the north. The intercolonial service is under contract with the colonial governments. Cargo steamers of the Royal Mail Company leave London monthly for West Indian ports and take return cargoes. Transatlantic cargo services are also maintained from Liverpool and Glasgow at frequent intervals.

The Elders and Fyffes Shipping Co., Ltd., maintain a service to Jamaica direct from Bristol. The Leyland-Harrison line dispatch steamers from Liverpool and Glasgow every ten days; other steamers leaving from London are those of the Demerara and Berbice Steamship Company, Scrutton Sons & Co., direct line of steamers, and the East Asiatic Company, Limited. Trading in fruit between New York and Jamaica are the Hamburg-American Line, the

United Fruit Company, and the Atlantic Fruit Company. The Quebec Steamship Company's steamers sail about every ten days from New York to the Leeward and Windward Islands, Barbados, and British Guiana; and the steamers of the Trinidad Shipping and Trading Company leave New York every twelve days for Grenada, Trinidad, and Tobago. The Canadian and West Indian steamship services have lately been renewed. There is a direct service with Bermuda and Jamaica and a subsidized fortnightly service from St. John, New Brunswick, and Halifax, Nova Scotia, to the Lesser Antilles and British Guiana. In crop time additional steamers are engaged to carry sugar and molasses to Canada.

At Jamaica, British Guiana, Trinidad, Grenada, and Dominica small coasting steamers serve to distribute goods brought out by the larger steamers, and supply return cargoes.

Tourist traffic.

In addition to the numerous facilities, mentioned above, for the interchange of commodities between the West Indies and the outer world, an increasing tourist business is being developed with these beautiful and historic possessions. The tourist season extends from the end of November to April. Some of the leading steamship companies, such as the Royal Mail Steam Packet Company and the Hamburg-American Line, organize series of tours, with large and well-equipped steamers of 10,000 to 12,000 tons, during the winter months from England and New York. Jamaica, Bermuda, the Bahamas, Barbados, Trinidad, and the Windward and Leeward Islands are favourite places of resort for the overseas visitors. The Governor of Barbados in his Report for 1910–11 mentions that 'the Colony owes much of its increasing prosperity to the visitors who stay in the island'.

Railways, roads, and water-ways.

As regards internal means of transport, most of the larger colonies possess railways, which conveniently supplement the work of the coasting steamers. There are also electric tram-lines, and with few exceptions the roads are maintained in good order. Motor-cars are in

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general use in Jamaica, Trinidad, and Barbados. The Jamaica Government Railway, 184 miles, taps several rich agricultural districts. It is reported to be efficiently managed. In 1912 the gross revenue was £190,007 and the gross expenditure £97,829. In the Blue Book Report for 1911 it is mentioned that 'the great and increasing importance of the banana traffic is clearly indicated'. The total length of the main road system in Jamaica is 1,994 miles.

British Honduras depends on its numerous water-ways for bringing down mahogany, cedar and logwood, and carrying back supplies to the interior. A short railway, 25 miles, has recently been constructed at Stann Creek for bringing down bananas for shipment to New Orleans.

British Guiana utilizes, as far as it can, its large rivers for communication with the interior lands. The existence of rapids and falls obstructing the navigation has already been mentioned. Along the coast there are two lines of railway running east and west, a distance of 65½ miles. A short railway, 18½ miles, connects the Demerara River with the Essequibo River, above the first rapids at Wismar to provide access to the Potaro gold-fields. The coast roads running parallel (within a mile or so) of the sea, measure 268 miles, and are provided with bridges and steam ferries.

Trinidad possesses three lines of railway extending for 90 miles east and south. There are 12¼ miles of electric tramways in the neighbourhood of Port of Spain. Barbados is distinguished for its numerous and well-kept roads, which render every portion of the island easily accessible. There is a light railway, 24 miles, connecting Bridgetown with St. Andrews. A large portion of the inland transport is in the hands of freighters or small contractors. In the Windward and Leeward Islands, the sea, especially on the sheltered leeward coast, is the natural highway, and several small craft, in addition to the coasting steamers, are engaged in bringing in produce for shipment. There are also well-kept coast roads for wheeled traffic.

CHAPTER XV

THE FALKLAND ISLANDS AND THEIR DEPENDENCIES

By Dr. William S. Bruce

Position and political connexion.

The Falkland Islands, South Georgia, the Sandwich Group, the South Orkneys, and South Shetlands are islands united geographically by a submarine ridge or 'rise' that at one time joined the Andes of South America to Antarctica, and consequently they may be termed the Andantarctic Archipelago. Until recently the Falkland Islands alone were British, partly because they were occupied by British shepherds and partly on account of their strategic value. Now they are valued commercially rather than strategically, and the other islands mentioned have been made dependencies of the Falklands as well as the Graham Land extension of Antarctica. This is due to the development of whaling, the direct result of various scientific expeditions, and more particularly to the reports of the naturalists on the Scottish whalers in 1892–3, and to the researches of the Scottish National Antarctic Expedition of 1902–4. This debt to scientific research is not too readily acknowledged by those who have made their fortunes in whaling.

Early settlement.

The discovery of the Falkland Islands is generally attributed to Davis in 1592, but there is reason to suppose that previously to this they had been found by some unknown foreign navigator. In 1594 Sir Richard Hawkins, in ignorance of 'Davis' Southern Islands', called them Hawkins' Maiden Land, after sailing along their northern coasts, but the name by which the islands are now known was given them in 1690 by Captain Strong in honour of Lord Falkland. In the early part of the eighteenth

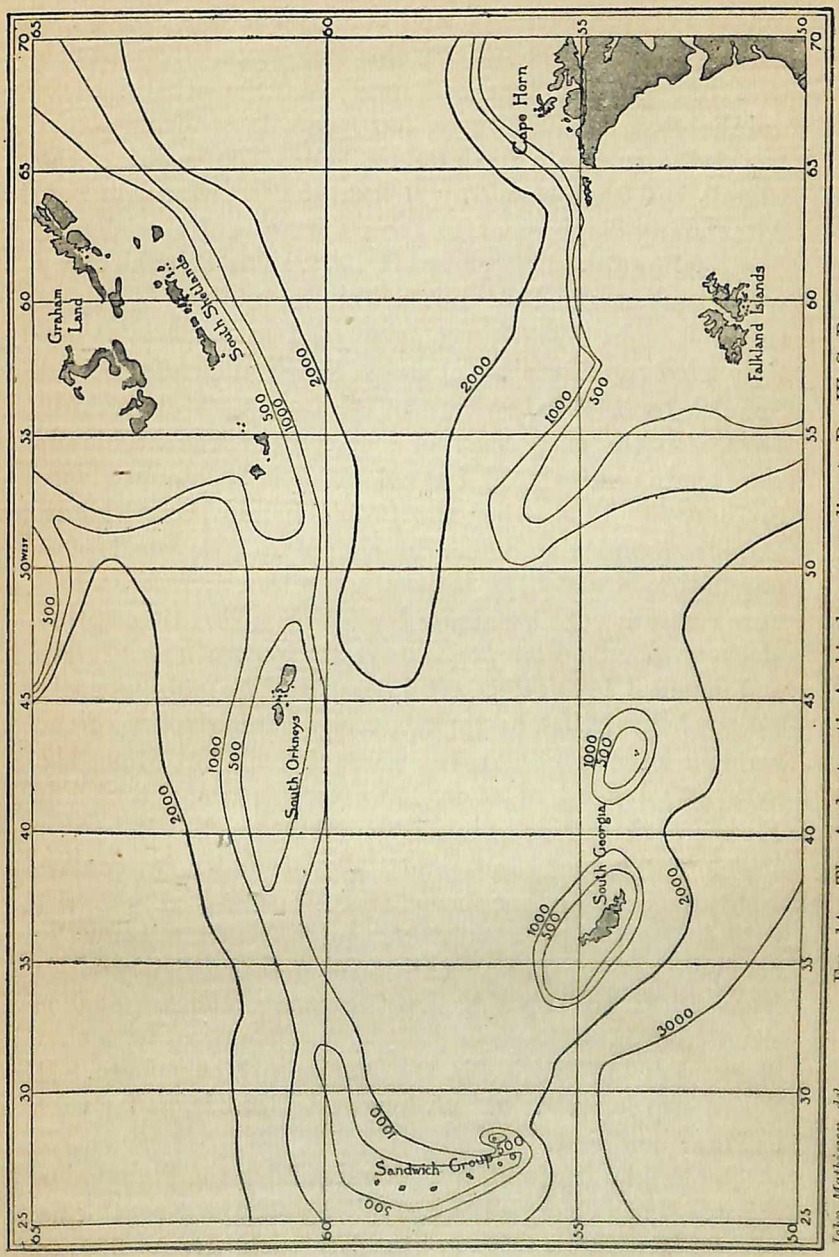

FIG. 14. The Andantarctic Archipelago according to Dr. W. S. Bruce.

John Mathieson, del.

century they were frequently sighted by French ships sailing between St. Malo and the Pacific, and hence the French name for the islands, Iles Malouines. The French in 1764 were the first to found a settlement on these uninhabited islands, but a few years later France sold her rights to Spain for £25,000. In 1765, however, the islands had been taken by Britain and a colony started. After many disputes as to the ownership of the islands, Spain relinquished her claims in 1771. The British colony was withdrawn in 1774, but Britain maintained her claim to the islands. The government of Buenos Aires at one time tried to maintain a claim on the grounds of previous Spanish ownership, but withdrew from that attitude in 1833. In the early part of last century the Falklands were again uninhabited, but colonization began once more in 1820. In 1833, when the *Beagle* visited these islands, Darwin found the officer in charge at the head of a population of which, he maintains, 'rather more than half were runaway rebels and murderers.' Darwin's description of these islands, however, except for general topography and natural history, is erroneous, and he subsequently acknowledged that he took 'an exaggerated view of the badness of the climate of these islands'. From the naturalist's point of view, however, his account in *The Voyage of the 'Beagle'* is well worth perusal.

Physical features.

The Falkland Islands and their dependencies are an archipelago lying between 51° S. and 63° S. (cf. the British Isles between 50° N. and 61° N.). They lie between 27° 30′ W. and 62° 35′ W. (cf. the British Isles from 2° E. to 11° W.). Port Stanley, the capital, is situated in 51° 41′ S., a latitude almost identical with that of London, 51° 30′ N., in the Northern Hemisphere. It lies, however, in 57° 51′ W. longitude, that is, as far west as Newfoundland.

The Falkland Islands.

The Falkland Islands are 300 miles from the Patagonian coast. South Georgia lies 850 miles to the east-south-east of the Falklands, the South Sandwich Group 300 to 400 miles south-east of South Georgia, and the most southerly of them, Southern Thule, is 550 miles east-

by-north of the South Orkneys. The South Orkneys are, however, only 650 miles south-east of Port Stanley, 450 miles south-west of South Georgia, and 250 miles east of the South Shetlands. The South Shetlands, separated only by a relatively narrow channel, Bransfield Strait, from Graham Land, are 550 miles to the southward of the Falkland Islands.

The Falkland Islands are the only part of the Andantarctic Archipelago which has been more or less completely surveyed, consequently the area of the archipelago is uncertain, but it may be estimated at about 10,000 square miles, excluding the interior of Graham Land. In the vicinity of the wintering stations of the several scientific expeditions parts of the South Orkneys, South Georgia, and the east and west coasts of Graham Land have also been surveyed in detail, while to these same expeditions is the credit due of furnishing us with what we know, not only of the natural conditions, but to a very great extent of the economic value of this outlying archipelago and farthest south British colony.

Number, extent, and physical character.

The Falkland Islands consist of two large islands, East Falkland (3,000 square miles), and West Falkland (2,300 square miles), and about a hundred small islands, making the total area about 6,500 square miles. The country presents much the same appearance as many parts of the West Highlands of Scotland. The surface is an undulating moorland broken in parts by quartzite ridges and peaks rising above a peat-covered land. The highest point is Mount Adam, 2,297 feet. The coasts are indented with numerous inlets and creeks ramifying far inland and forming excellent harbours. The town of Port Stanley is situated on one of them—a harbour of refuge well known to sailing vessels that have been dismasted or otherwise severely damaged in their passage round Cape Horn.

South Georgia.

South Georgia is 120 miles long from north-west to south-east and about 30 miles broad. It is much more mountainous than the Falklands, the axial range rising to nearly 8,400 feet. Many sea-lochs form excellent harbours

and are continued inland as glens with glaciers at their heads, while in some parts, especially in the south, the glaciers reach the sea.

Mr. David Ferguson, who resided in South Georgia during 1912–3, has made a careful study of its general structure, and describes the coasts as rock-bound and more or less precipitous. Owing to the recession of glaciers, there are several patches of detrital flats and moraines inside rock-channels scooped out by glacial action. The coast has generally a stern and rugged appearance not unlike parts of the north-west Highlands of Scotland. 'Along the north-east coast-line,' he says, 'running from north-west to south-east, the outer escarpments are succeeded inland by rocky heights, having ice-fields in every hollow, and eventually culminating in the central or Allardyce Range of mountains. The central range, except in steep rock escarpments and splintery crests, is covered with permanent ice-fields and snow.

'Mount Paget, the highest point of the central range, 8,383 feet above sea-level, has almost vertical escarpments of gnarled rusty-brown rocks to its summit, surrounded by ice-fields and glaciers, slowly moving down to the edge of the Nordenskjöld Moraine Fiord and Moraine Flat Glaciers in Cumberland Bay.

'Looking up Cumberland Bay on a fine clear day, rather an event in South Georgia, we have a magnificent view of the steep walls of uniformly bedded and stratified rocks, which run into narrow chasms and gorges, like Moraine Fiord, and rise into frowning reddish-brown ramparts and walls, to the crest of Mount Paget, the Sugar loaf, and the Nordenskjöld Peak. The red-brown colour of the rocks is contrasted perfectly with the sparkling white of the ice-fields and glaciers, and presents to the eye a view of lake and mountain scenery at once grand and picturesque.'

Dr. Carl Skottsberg describes the island 'as giving a strong impression of being part of a mountain chain, one of the broken links of the "Antarctandes", rising abruptly out of the ocean, a very broken crest of considerable height with numerous steep peaks of which at least Mount Paget reaches 2,000 metres.

'A large area of the island is glaciated, but there is no inland ice-cap, glaciation being of an Alpine type with numerous large glaciers that descend into the valleys from the hill-tops. There is not much foreland, the lowland being found in strips round the sea-lochs. The lower mountain sides are covered with débris of stones, and slips often occur in many steep places'.

South Orkneys.

The physical features of the South Orkneys are similar to those of South Georgia, but the mountains are not so

lofty and the land is much more completely ice-covered. The South Orkneys consist of two large islands, Coronation Island and Laurie Island. The *Scotia*, the vessel of the Scottish National Antarctic Expedition, wintered there in 1903, and Laurie Island was surveyed in detail. It is remarkable for a number of narrow peninsulas, which separate striking sea-lochs and deep bays from each other. Laurie Island, except in the east, is composed of a series of mountain ridges, crests of a sunken mountain system rising to 2,000 feet above the sea. The land is very heavily glaciated from the summits to the sea, and the coasts are extensively fringed with ice-faces. Coronation Island presents an exactly similar appearance, but is loftier, its mountains being said to reach an altitude of 5,000 feet. There is nearly always a considerable body of pack-ice in the vicinity of the South Orkneys, and sometimes it is very heavy and tightly packed, making it difficult for even a vessel protected against ice to reach them.

South Sandwich Group.

Very little is known of the South Sandwich Group. It consists of a chain of half a dozen small islands lying in a north and south direction between 56° S. and 60° S. and between 26° W. and 27° W.; at least one of the islands, Candlemas, is reported to be an active volcano, and Bristol Island is said to have a good harbour for small craft.

South Shetlands and Graham Land.

The western islands of the South Shetlands are fairly well known, as well as the east and west coasts of Graham Land—the northern extension of Antarctica. These regions reflect generally in inverted form the southern extension of South America. The Andean Chain repeats itself and tends to run along the west of Graham Land just as it does along the west of South America, forming a precipitous coast broken into deep sea-lochs and coastal archipelagos of rocky islands, whereas the lower lying slopes and plains extend to the east. The main difference is that whereas South America is almost free of glaciers Graham Land is almost completely ice-covered.

Geology.

The Falkland Islands are almost entirely of Devonian

formation, the fossil fauna being of Lower Devonian age.

'The oldest rocks are coarse-grained arenaceous sediments resting unconformably on the eroded surface of an Archaean basement at Cape Meredith. These probably correspond to the lowermost members of the Cape system, the Table Mountain series of quartzites and sandstones, which, like the Falkland Island rocks, are without fossils. The fossiliferous middle division of the Falkland Devonian consists of soft, fine-grained sandstones and slate, which occupy most of the large areas of low ground and the valleys of the highlands. The fauna of this corresponds very closely with the Bokkeveld of Cape Colony, showing less intimate relationship with the lower Devonian found in several parts of the South American continent. Finally come the uppermost Falkland Devonian, hard, coarse sandstones and quartzites, invariably forming hills and ridges of the middle and northern parts of West Falkland, and in the northern part of the East Island. To this series the rocks in the neighbourhood of Port Stanley belong. The Southern half of East Falkland and a small patch at Hill Cove in West Falkland belong to a formation younger than the Devonian with the fossil flora of the southern palaeozoic continents' (Dr. Harvey Pirie).

During sub-glacial conditions, with a large amount of snow melting, there was a process of what is termed solifluction, such as is seen in certain Arctic lands (e.g. Bear Island) when the weathered surface waste material, saturated with water, becomes a semifluid mass of rock slabs, fragments, gravel, and fine mud. This mud-glacier, as it has been termed, tends to move slowly down hill, and comes to rest in the lower parts of the valleys. Subsequently, when water has washed away the greater part of the finer material, only a residue of coarse rocks is left, which to-day form the wonderful Stone Rivers of the Falkland Islands.

While there are no glaciers in the Falkland Islands the glens of South Georgia, in almost the same latitude, are filled with glaciers, many of which reach the sea. By far the greater part of the South Orkneys is covered with ice.

South Georgia and the South Orkneys resemble each other in many respects. Both appear to be peaks of a sunken land-mass of similar age, once much more extensive. Their hills rise into sharp peaks. Their shores are

indented with deep sea-lochs, but good harbours are scarce. The rocks of the South Orkneys correspond in age to the Hartfell shales of the Upper Ordovician and the basal shales of the Silurian. Those of South Georgia, if not of the same age, are at least older than the Upper Palaeozoic (Pirie, *Report on the Scientific Results of the 'Scotia'*, vol. viii).

'Whilst,' says Dr. Pirie, 'the most recent earth-movements at the South Orkneys have been in favour of the land, there must have been previous to that much more extensive depression. The evidence of this is, of course, as is usual in such cases, more indirect, but pointing to it we have :

1. The general outline of the islands, which is that of a sunken land.
2. The presence of a fairly wide 200-fathom shelf, with beyond it a rapid drop to 2,000 fathoms.
3. The fact that the islands are composed of sedimentary rocks along with the presence of other rocks of not very remote affinities in South Georgia and the Falkland Islands, suggesting that they are all fragments of a once extensive land.
4. More conclusive and recent evidence is provided by the fact that many of the off-lying rocks and islets show signs of having been over-ridden by the ice-sheets of the mainland. This greater extension of ice could only have taken place with a more extensive land surface ; neither greater precipitation nor less ablation than at the present day (with the present land surface) could account for it.'

Dr. Gunnar Andersson is of the opinion that further exploration of the South Shetlands may reveal a connecting link between the western Shetlands and their eruptive rocks folded along a north-east and south-west axis and the South Orkneys with their ancient sedimentary rocks folded along a north-north-west and south-south-east axis. Dr. Pirie, however, thinks that 'the relationship of the South Orkneys will be found to be more intimate with the islands to the N.W. and N.E. than with those of the west '.

'The relationships', says Dr. Pirie, 'of these widely separated areas, with deep water intervening, are still highly speculative. It may be that the main Andean axis, already turning eastwards in Southern Patagonia and Tierra del Fuego, is continued in this direction south of the Burdwood Bank,

and then curves southwards between the South Orkneys and South Georgia. In this case the Silurian rocks of the South Orkneys may be related with the Silurian rocks occurring on both sides of the main Andean chain in Bolivia and Northern Argentina, and in the province of Buenos Aires, in the Sierra Tandi and Sierra de la Ventana.

'The Falkland Islands present an analogy to the Argentine *Praecordilleras* and the Sierras *Pampeanas*, a border zone between the ancient Gondwana land-mass and the Andes, with the important exception that the folding in the Falklands disappears rapidly towards the south, i.e. the central cordillera, a feature which is difficult to reconcile with an extension of the Andean structures eastward through a curve to the Sandwich Group and thence via the South Orkneys to Graham Land.

'On the other hand, the Falklands present many points of agreement with the South African formations of similar age, although they cannot be considered as having the same position in regard to the leading tectonic lines of the earth. It may be, however, that they are, along with South Georgia and the South Orkneys, fragments of an ancient "Flabellites land".'

Graham Land was the first part of Antarctica from which definite information was obtained regarding the age of its rocks. In 1893 Dr. C. W. Donald brought home, on board a Scottish whaler, the *Active*, Tertiary fossils from Seymour Island. Subsequently the researches of Swedish, Belgian, and French explorers have elucidated the geology of this part of the continent and its adjacent islands, including the South Shetlands. Both the west coast of South America and the west coast of Graham Land are made up of the same kind of folded rocks, gneisses, granites, &c. Along the east of these in both lands there are sedimentary rocks of more recent origin with plateau formation, and there is a tendency for active volcanoes to appear.

Climate. A striking difference of climate exists between the Falkland Islands and South Georgia on the one hand and South Orkneys, South Shetlands, and Graham Land on the other, the thermal gradient being very steep. The climate of the Falkland Islands is much more salubrious than that of South Georgia, in spite of the fact that the north coast of South Georgia is little more than a degree farther south than the south coast of the

Falklands. A glance at the Admiralty ice-chart, however, shows that whereas the Falkland Islands lie well outside of the average limit of drifting ice, South Georgia is well within the limit which reaches 40° S. in that longitude.

Precipitation is practically all in the form of rain in the Falkland Islands, in South Georgia it is more often in the form of snow, and in the South Orkneys, South Shetlands, and Graham Land it is nearly all in the form of snow.

In his consideration of 'The Weddell Quadrant and Adjacent Areas' (*Rep. Scient. Res. of 'Scotia'*, vol. ii) Mr. R. C. Mossman says that in the 'Falkland Islands we find a strictly oceanic climate, viz. strong winds, equable temperature, and a moderate rainfall, which last, however, is probably much greater on the West Falklands than at Cape Pembroke, the station here quoted. A noticeable feature here is the large amount of sunshine recorded. Between the Falklands and South Georgia, which lies only 2° to the south, but some 22° to the east, a great difference is found. Here the influence of the Antarctic drift makes itself felt, the mean annual temperature being 8° lower than at Cape Pembroke, or at Staten Island. However, as regards sunshine and wind force, the two stations are almost identical. At the South Orkneys the influence of the Antarctic drift is for the first time the predominant factor affecting climate. Here, in the low latitude of 61° S., the mean summer temperature is below freezing point, while in the winter readings below −40° F. have been recorded. Perhaps the most striking example of the effect of the Antarctic drift on the climate conditions in low latitudes as compared with the North Polar Regions occurs during summer. At this season the isotherm of 34° between the long. of 10° E. and 50° W. nowhere protrudes farther south than 58° S., and falls to about 52° to the east of the meridian of Greenwich. The most southerly extension of this isotherm in the Arctic is in latitude 74° N., long. 16° W., while to the north of Spitsbergen it lies in latitude 81° N., long. 10° E. Thus on this meridian of 10° E. the

summer isotherm of 34° is located only 540 miles from the North Pole, but, as we have seen, quite 2,300 miles from the South Pole. Such is the great effect of the Antarctic drift-ice in the lowering of temperature.'

Hydrography: local.

Local hydrographical knowledge of the Falkland Islands consists of a detailed survey of its coasts, with several thousand soundings around the main islands, in the creeks and channels, and between the hundred islands. In addition to the detailed land survey of Laurie Island (South Orkneys), the *Scotia* took over 500 soundings in the sea-lochs of Laurie Island, especially in Scotia Bay. A considerable number of soundings have similarly been taken around South Georgia and in the neighbourhood of the Belgian, French, and Swedish scientific stations on the west and east coasts of Graham Land. These expeditions have also done good work on the physics of the sea in the vicinity of the places named. In the Falkland Islands, however, few physical observations of the sea have been taken, mainly because these scientific expeditions were not planned to do work in these parts, but farther to the south. Although for many years the Falkland Islands was a naval station for the South Atlantic, the ships of the Royal Navy have done practically nothing to investigate the physical conditions of the sea. They have confined themselves to soundings in the shallower waters.

Hydrography: general.

It was left for the *Scotia* to inaugurate this physical and general deep-sea work during the years 1902–4, and additional information has been obtained by the German *Deutschland* expedition which returned from the Weddell Sea at the end of 1912.[1] These investigations, and those of the Swedish vessel *Antarctic*, have shown that there is a rise, or submarine ridge, of less than 2,000 fathoms, which unites South America with Antarctica by way of Tierra del Fuego, Falkland Islands, South Georgia, Sandwich Group, South Orkneys, South Shetlands, and

[1] A full consideration of the work of the *Scotia* will be found in the *Report on the Scientific Results of the Voyage of S.Y. 'Scotia'*, and a full account of the German work will be published shortly.

Graham Land. Almost certainly at one time this 'rise', if not entirely above sea-level, was so to a great extent, and formed a land bridge between South America and Antarctica. Weddell, speaking of the South Orkneys, says, 'The tops of the islands, for the most part, terminate in craggy towering peaks, and look not unlike the mountain tops of a sunken land.' Such was the impression of an intelligent seaman who was certainly not a geologist, but it is interesting to note that this layman's opinion is exactly the same as that of geologists, for Dr. Pirie says of the South Orkneys and of South Georgia, that 'both appear to be peaks of a sunken land-mass of similar age once much more extensive'. The accompanying map shows the bathymetrical conditions as far as they are known at the present time.

It may be noted that the Archipelago lies practically entirely within the region of the great easterly drift which sweeps from the west through Drake Strait and continues its course round the Southern Hemisphere. On the other hand, to the south of the Andantarctic Archipelago, in approximately 65° S., the drift appears to be westerly until it strikes the east coast of the probable land-mass of New South Greenland. It then turns northward until it mingles with the easterly drift to the south of the South Orkneys. Detailed investigations of the temperature and salinity of these seas have been made by the expeditions on the vessels *Scotia*, *Antarctic*, *Deutschland*, *Belgica*, *Français*, and *Pourquoi-Pas ?*, but these investigations have not yet been fully worked up and appear to be very complex. One point of interest, however, is that in Bransfield Strait, between Graham Land and the South Shetlands, there has been recorded one of the lowest bottom temperatures yet taken, while the *Challenger* investigations showed that a bottom layer of cold water, which evidently comes from the Antarctic regions, flows northward along the Brazilian coast.

Vegetation.

In Graham Land, the only two flowering plants known in the Antarctic regions were discovered by Dr. Charcot's Expedition in 1904–5. One of these, a grass, is known in

the South Shetlands, but otherwise these lands, including the South Orkneys, have no phanerogams. The flora comprises many species of mosses and lichens and a considerable number of unicellular algae. Some marine algae also occur quite plentifully in places where the sea-ice does not rub them off the rocks over which it grinds with the tide and weather. In South Georgia, however, there are, besides algae, lichens, and mosses, a number of ferns and no less than fifteen species of flowering plants. Tussock grass grows quite luxuriantly. The Falkland Islands have a still richer flora, no less than 143 species of phanerogams having been recorded.

This archipelago is of very special interest in relation to the Antarctic flora, for Dr. Rudmose Brown points out[1] that 'while our knowledge of Antarctic flora is certainly incomplete, all the known facts point to a Fuegian origin. Not only does an analysis of the distribution of the constituent elements indicate this, but the relative greater abundance of species in Graham Land and its vicinity than in Victoria Land, as well as the absence of New Zealand forms, shows that the flora of the Antarctic is due to an emigration of species from Fuegian lands. . . . Winds and birds must have done the work of giving Antarctica its present flora, *via* Graham Land from Fuegia and thence it must have spread westward *via* the coasts to Victoria Land, but naturally only a small proportion of the species were carried so far. However, it is quite possible that by the same agencies a certain number of mosses and lichens may have reached Wilkes Land and Wilhelm Land from Kerguelen and Heard Island, while South Georgia and the South Sandwich group may have contributed to Coats Land and the coast eastward towards Enderby Land. The floras of all these sub-antarctic islands from the Falklands eastward to Kerguelen have been shown to be related to one another, and to have strong Fuegian affinities.'

South Georgia has a short cold summer during which snowstorms are frequent, and a long winter with much snow, now and then interrupted by short periods of summer weather. Precipitation in South Georgia is mostly snow. It is evident that, in a place so little favoured, the exposure towards the different points of the compass will play a very important part in determining whether the snow accumulated during the winter will melt during spring and

[1] *Report Scient. Res. of 'Scotia'*, vol. iii.

summer, and consequently in the distribution of plants. In many places the snow is carried away by the gales, thus the moraine plains in Cumberland Bay along the Moraine Fiord, as well as in the West Fiord, are swept by strong winds and probably often laid bare, which fact partly accounts for the sparseness of the tundra-meadow and the predominance of moss- and lichen-tundra.

A climate like that of South Georgia greatly favours the formation of peat. Species of *Sphagnum*, always comparatively rare in sub-antarctic lands, are entirely absent, but peat-forming representatives of *Polytrichum*, *Dicranum* constitute one of the most prominent features of land vegetation. The two most important phanerogams, *Poa flabellata* and *Festuca erecta*, also give rise to a kind of peat.

'Of sub-antarctic lands South Georgia perhaps resembles the Arctic regions more than do the others, for instance the Falklands. Here the much less pronounced periodicity of vegetative phenomena is especially striking, there is a very large proportion of evergreen species that keep fresh and vigorous throughout the winter, with or without a protective snow-cover. There are all sorts of chamaephytes of caespitose habit, cushion-plants, dwarf-shrubs, perennial herbs with creeping rhizomes or forming dense mats, &c. . . . They cannot count on a prolonged rest in the winter as can Arctic plants; after some days with snowstorms and slight frost may follow others when the soil is thawed and the plants are awakened to life for a short time.'

Animal life: mammals.

The most important animals at the present time associated with the Andantarctic Archipelago are the Cetacea. To whales the colony owes chiefly its present prosperity. There are hundreds of thousands of these greatest of all mammals. The writer records in Burn Murdoch's *From Edinburgh to the Antarctic*, that on the 16th of December (1892), when his vessel first met ice it passed among thousands of finner whales. Many came quite close to the ship, and as far as the eye could reach in all directions, one could see their curved backs, and see and hear their resounding blasts. Euphausia swarmed in the water. Many Blue Petrels and myriads of Cape Pigeons were flying around and settling on the surface. This gives an idea of the

prominence of whales as members of the fauna of the seas of this scattered and far southern British archipelago. The chief species of whales found in seas adjacent are as follows: 1. Southern Right Whale (*Balaena australis*). 2. Rorqual, Fin Whale, or Razor-back (*Balaenoptera musculus*). 3. Sibbald's Rorqual, Blue Whale, or Sulphur-bottom (*Balaenoptera sibbaldi*). 4. Rudolphi's Rorqual, or Seihval (*Balaenoptera borealis*). 5. Humpback Whale, or Long-armed Whale (*Megaptera boops*). 6. Sperm Whale or Cachalot (*Physeter macrocephalus*). 7. Pilot Whale, Laing Whale, or Round-headed Whale (*Globiocephalus melas*). 8. Grampus or Risso's Dolphin (*Grampus griseus*).

The only land quadruped of this archipelago was a larger wolf-like fox (*Canis antarcticus*) which was only to be found on the Falkland Islands. It appears to have been a peculiar species, and when Darwin visited the islands was common to both East and West Falkland. Between his visit, however, and that of the *Challenger* thirty years later the animal had become extinct—a most regrettable circumstance, because there appeared to be 'no other instance', says Darwin, 'in any part of the world of so small a mass of broken land distant from a continent possessing so large an aboriginal quadruped peculiar to itself.' Darwin's forecast is of interest when he says, 'within a very few years after these islands shall have become regularly settled, in all probability this fox shall be classed with the dodo, as an animal which has perished from the face of the earth.'

The only other native mammals that live in the Falklands are the sea-lion (*Otaria*), and the fur seal (*Arctocephalus*). The sea-elephant (*Macrorhinus*) is also not an infrequent visitor, and occasionally some of the Antarctic true seals visit the coast.

Man has, however, introduced other mammals, the rabbit, the common rat, the common hog, which is now rare, and a field-mouse. In Darwin's time a vast number of wild cattle and horses covered the land. Now these have all been killed out and replaced by the more profitable

sheep, with the exception of one or two herds in the most inaccessible islands.

Bird-life is plentiful. Penguin rookeries are to be found in many places, and have to be protected from the depredations of man. Gulls, shags, skuas, geese—Kelp, Brent, and Upland—the steamer duck, oyster-catchers, herons, and the like, are plentiful around the coasts and in every creek and sea-loch, while quite a number of land birds are to be found inland. Upland geese have become too numerous, probably owing to the extinction of the fox, and legislation has been passed for their diminution; and owing to the damage done to sheep by turkey buzzards, carranchos, and johnny rooks, the number of these birds is also being reduced, a price being paid for their beaks, which is certified by a 'Receiver of Beaks'.

Fish abound in the creeks and harbours, and during 1904 the *Scotia* naturalists fell in with numerous shoals of herring (*Clupea fuegensis*). There is a very rich marine invertebrate fauna, a special study of which has been made by Darwin, Valentine, the naturalists of the *Scotia*, and others.

Economic and Social Conditions

Pastoral industry.

The main industry of the Falkland Islands is sheep-farming, the land supporting over 700,000 sheep. These sheep have been bred mainly for wool, but during the last three years two canning factories have begun work capable of dealing with 600 and 300 sheep daily; in 1912 about 46,000 sheep were canned or boiled down. The demand for sheep of good weight is steadily increasing, both for the canneries in the colony and for export.

Whaling.

The advent of whale-hunting, which has, as already stated, followed the scientific investigation of these regions, has not only increased the commercial importance of the Falkland Islands but has made its island dependencies a valuable commercial asset. The wintering of the Scottish expedition in the South Orkneys, of the Swedish expedition on the east coast, and the French expeditions on the west coast of Graham Land, and the work they have done in cartography, meteorology, and zoology have all led

to this commercial development. The whalers would certainly not have been there at the present time but for the pioneer work of these expeditions, and the special reports that one and all brought back of the presence of whales in enormous numbers in those seas, and of excellent harbours wherein to secure the products of these valuable cetaceans.

In spite of urgent endeavours as early as 1893 and some years subsequently made by British subjects to start whaling on modern lines in the waters of the colony and its dependencies, it was left, owing to the apathy of the home authorities, to Norwegian and Argentine enterprise to start a whaling industry that has proved such an important commercial asset. The total value of the products of this industry during 1912 was £886,795, and for 1913 was estimated at £1,350,000 (up to September 30), and of this by far the greater part is derived from South Georgia, the South Shetlands, Graham Land, and the South Orkneys.

One company in the Falkland Islands during 1911–12 produced a total of 2,444 barrels of oil. In South Georgia eight companies are now established. They employ 1,000 men in their factories ashore and afloat. During 1911–12 172,000 barrels of oil, 81 tons of whalebone, and 30,270 bags of guano were produced. The South Orkneys and the Sandwich Islands were each visited by one company, and ten companies held licences for the South Shetlands and Graham Land. These accounted for 152,770 barrels of oil and 403 tons of whalebone. In South Georgia, in 1911, 7,000 whales were brought in, i.e. about 50 per cent. more whales and nearly 40 per cent. more oil than the total result of the combined efforts of the whole whaling fleet operating in the northern industry.

It is interesting to note that, 'altogether the total catch (1911) of the eighty-six steam whalers operating in the Southern Hemisphere was about 17,500 whales, yielding about 500,000 barrels of oil, representing a gross value of about £1,175,000.'[1] The season 1911–12 yielded

[1] T. Salvesen, 'The Whaling Industry of To-day,' *Scottish Bankers' Magazine*, July 1912

about 327,000 barrels of oil, and the gross value of the fisheries was about £887,000.

White fisheries.

There is reason to believe from investigations made by the *Scotia* in 1903 that there might be profitable white fishing carried on in the waters of this colonial archipelago, such as is carried on in northern latitudes, but the British have not undertaken it, although Uruguay and Argentina are now making special efforts to investigate the fishery resources of the South Atlantic.

Sealing.

Sealing is also carried on in the most casual way, although the fur seals are more or less protected by law. Owing to the remoteness of many of the rookeries from head-quarters, depredations are not infrequent, which, unless checked, may result in the extermination of the fur seal. It is a question, however, how far the sea-lions (*Otaria jubata*) occupying many islands might be replaced by more profitable fur seals.

No mining is carried on in the colony.

Transportation-shipping.

In 1912, 88 steamers with a tonnage of 186,979, and 12 sailing ships with a tonnage of 10,824 tons entered Port Stanley. Most of these latter came for repairs.

Trade.

The value of the imports of the Falkland Islands, exclusive of their dependencies, for 1910, 1911, and 1912 was about £94,000 a year, while exports rose from £309,000 in 1910 to £471,000 in 1911 and £623,875 in 1912. This large increase is almost entirely due to the whaling industry. The exports are chiefly to the United Kingdom and Norway. In addition to these exports, whale oil and guano, valued at over £433,000 from South Georgia, £427,000 from the South Shetlands and Graham Land, and £19,000 from the South Orkneys, were exported in 1911–12 to the United Kingdom and Norway.

Port Stanley is distant 8,130 miles or twenty-seven days from Liverpool. In 1912 over 169,000 postal packets were dealt with at the Falkland Islands.

Postal and telegraph service.

The commercial importance of South Georgia is indicated by the fact that there is now a regular mail-service between this island and Buenos Aires, at a distance of

1,500 miles, for which a subsidy was offered by the Colonial Government, but refused. In 1911 there were fourteen mails, the total number of postal packets received and dispatched in 1911 was 25,325, an increase of 16,979 over 1910.

The hitherto isolated state of the colony has terminated by the erection and opening in September 1911 of a wireless telegraph station two miles from Port Stanley, capable of communicating at night with Buenos Aires or Monte Video. Until the present time telegrams have been forwarded from Buenos Aires by post.

Population. The census of 1911 showed the population of the Falkland Islands to be 2,772, increasing as follows from 1881 : 1881 = 1,553, 1891 = 1,789, 1901 = 2,043, 1911 = 2,264 : to the population of the Falkland Islands must be added the population of South Georgia, which in 1911 was 1,003, making a total of 3,275. This large increase of population, mostly Norwegians and Swedes, since 1901, viz. over 60 per cent., is due to the development of the whaling industry, and it should be mentioned that after March, during the winter, the greater part of those men employed in the floating factories of South Georgia leave.

Out of the total of 3,275 the total number of males is 2,370, and of females 905, or an average of only 38·2 per cent. of females ; in 1901 the percentage was 69·8. This is on account of the large number of men employed in the whaling industry. The population of Port Stanley in 1911 was 905, practically stationary.

In 1911 there were 1,421 British subjects born in the colony, and 673 British immigrants. Out of 1,093 foreigners, 980 were Norwegians and Swedes.

The people have until recently been mostly of Scottish descent, and almost entirely devoted to sheep-farming and dependent trades. Ship repairing and condemning at Port Stanley also forms locally an important item of profitable industry. These thrifty people have entirely replaced the early South American settlers and guachos, and with them have vanished the wild cattle and horses, which were less profitable than sheep.

The government of the colony is vested in a governor, aided by an executive council of four members, and a legislative council appointed by the Crown. Government.

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CHAPTER XVI

DEFENCE OF AMERICAN TERRITORIES

Canada

Problems of Canadian defence.

THE questions involved in the participation of the Dominions in Imperial Defence are fully discussed in Vol. VI, Chapter V, and in this chapter it is proposed to consider only questions of local defence. Before doing so it is desirable to draw attention to the relative importance of these two aspects of the question of defence as applied to Canada, and to the difference of opinion that exists with reference to naval policy amongst Canadian politicians. There are only two possible enemies that could attack Canadian territory—the United States and Japan. In Vol. VI it is pointed out that the possibility of war between the British Empire and the United States is not a contingency which has much influence on our defensive arrangements. Japan is our ally, till the year 1921 at any rate. Local defence questions are, therefore, certainly not acute in Canada, as is amply proved by the debates on Mr. Borden's Navy Bill. If they were, no Canadian Premier could propose to offer a sum of £7,000,000 as a contribution to the Imperial Navy. It is true that Sir Wilfrid Laurier is opposed to Mr. Borden's naval policy, and that he advocates the formation of a Canadian Navy in both the Pacific and the Atlantic, the ships to be built in Canadian yards by Canadian labour. But he has never pleaded the urgency of local defence questions as an argument for strengthening Canadian naval and military forces, as opposed to the policy of contributions. While, therefore, the rival parties in Canadian politics differ on the question of the emergency that is said by Mr. Borden to exist as regards imperial defence, and the interest of Canada in this question, both parties seem to be agreed that Canadian local defence is not an urgent matter.

Admitting this, Canada maintains military forces which,

by their organization and conditions of service, are unsuited for any other purpose than local defence. It is clear, therefore, that although there are no urgent questions arising as to the defence of Canada, and although she is perhaps less likely to be attacked than any other portion of the Empire, still her Government does not consider it politic to ignore the question of defence altogether.

That being the case, it is reasonable to consider here the elements of the military problems that would arise were she to be attacked, however unlikely such an attack may be.

Relations with Japan.

Attack by Japan may be dismissed in a few words. In all probability in such a contingency the United States would be our ally and the attack would have to come from oversea in the face of certain ultimate naval superiority. Although Japan could conceivably establish sufficient temporary naval superiority in the Pacific to enable her to attack the Western coast of Canada, it is not conceivable that she could maintain such superiority for long unless the British and American navies were fully occupied elsewhere. The attack could not, therefore, be formidable, and it is not worth while to consider possible developments in detail.

Relations with the United States.

The case of war with the United States is different, and it is proposed now to consider the purely strategical problems involved in such a war.

Neither Canada nor the United States maintains military forces of any considerable strength that can take the field on the outbreak of hostilities, but the resources of the United States are so greatly superior to those of Canada that, if no other factor were introduced, the initiative must necessarily rest with the United States. The only factor that could modify this conclusion would be the possibility of rapid reinforcement from oversea. It is not possible to make an accurate forecast of the time that must elapse before the British Navy could establish sufficient command of the Atlantic to move military reinforcements to Canada, but the work of destroying or immobilizing the American Navy would not be that of a day, and would necessitate the

accumulation of naval resources on that side of the Atlantic. It would not be reasonable, therefore, to assume that assistance from Great Britain could confer the initiative on Canada. If this is admitted it becomes necessary to examine the problem from the point of view of Canada's ability to resist attack.

Geographical considerations.

It is now necessary to study a map. The first point to strike the student of the geographical conditions is that the resources of Canada are to a very great extent concentrated in that portion of the country which lies east of the Great Lakes and along the banks of the St. Lawrence. This district consists of a comparatively long and narrow belt of settled country with a hinterland of forest. No withdrawal in a northerly direction is therefore possible.

From Quebec to Toronto is a distance of 450 miles. From Montreal to the head of Lake Champlain is only 35 miles. From Ottawa to Ogdensburg is only 50 miles. For 100 miles below Kingston the St. Lawrence divides Canadian territory from that of the United States. Montreal is the commercial centre of Canada and the most important objective of the enemy. Its exposed position and the difficulty of maintaining communication with the other important centres of Quebec, Ottawa, Kingston, and Toronto by routes that run parallel to the enemy's frontier and at no considerable distance from it, while one most important avenue of communication, namely, the St. Lawrence and its canals, actually forms a considerable section of the frontier itself, are apparent. The importance of Halifax, Nova Scotia, as a port of disembarkation for reinforcements from oversea and of maintaining railway communication between that port and Quebec is emphasized by the fact that the mouth of the St. Lawrence is closed by ice during the winter. The same applies in a minor degree to St. John, New Brunswick. It is not too much, therefore, to say that the defence of Canada is largely a question of the maintenance of communications, which are so exposed that their protection involves problems of the greatest difficulty.

The next point of importance is the position of the Great Lakes. By a convention entered into between Great Britain and the United States, in 1817, the number of armed vessels that may be maintained upon the lakes is limited to one each on Lake Ontario and two each on the Upper Lakes. Owing to the vastly greater resources of the United States, as regards shipping, and the power of extemporizing armaments, it is certain that the maritime command of the lakes, with the possible exception of Ontario, would fall to the United States. The possibility of reconquering the command of the Lakes by means of naval reinforcements is doubtful, unless effect is given to the project of the Georgian Bay—Ottawa—Montreal Canal, for which surveys and estimates have been made. Till this project is carried out, to establish maritime command of the lakes, it would be necessary to keep open the navigation of the St. Lawrence and its canals below Kingston, to prevent the destruction of the Welland Canal between Lakes Ontario and Erie, and to maintain communication by the St. Clair River between Lakes Erie and Huron. A glance at the map will show the dispersion of force necessary to carry out the above. The Great Lakes.

If the maritime command of the lakes cannot be reconquered, American military expeditions can cross Lake Huron and land in Canadian territory in Georgian Bay. The enemy would, therefore, be able to advance simultaneously direct from New York State via Lake Champlain on Montreal, and from Georgian Bay on Ottawa, and, if successful in such a combined movement, would probably strangle the life of Canada at the heart.

To maintain communication with the West against the superior forces that might be expected to invade Manitoba would probably be out of the question.

The successful defence of Canada, therefore, appears to depend on her power to maintain communication along the line of the St. Lawrence, from Kingston to Quebec, and to defend Ottawa and Montreal until such time as reinforcements from oversea will permit of the assumption of the offensive in this or some other theatre.

Canadian naval policy.

At the Imperial Conference of 1909 it was suggested to the Canadian representatives that the Canadian Government should provide a certain number of cruisers and destroyers to be stationed on the Atlantic and Pacific coasts of Canada, and that the foundations of a Canadian Navy should be laid in this way. Pending the construction of new vessels, it was suggested that the Admiralty should provide two cruisers so that the training of personnel could be proceeded with. These suggestions were approved.

In 1910 Sir Wilfrid Laurier's proposals for the Canadian naval service led to considerable discussion in the Canadian Parliament and throughout the Dominion, which showed that opinion on the subject was very divided. The cruisers *Niobe* and *Rainbow* were purchased from the Imperial Government to act as training ships, and the services of some British naval officers were lent to the Canadian Government. A Naval Act authorizing the creation of a Canadian Navy was passed, the proposed programme including the construction of four cruisers and six destroyers.

The experience of three years, however, has demonstrated very conclusively that the personnel required for even a very minor local force is not forthcoming, either as regards officers or men, from the Canadian population under existing social conditions. Moreover, the local steel shipbuilding industry is as yet on so small and undeveloped a scale that the construction of the specified ships would be a slow and very unduly expensive process as compared with similar work in the mother country. The policy adopted by Sir Wilfrid Laurier has, therefore, not succeeded in practice. The training ships are laid up for want of crews, and the tenders for building the new vessels have never been accepted. On succeeding to the Canadian Premiership, therefore, after the defeat of Sir Wilfrid Laurier's party, Mr. Borden informed Parliament that the part to be played by Canada in the naval defence of the Empire would be reconsidered.

In 1912 Mr. Borden visited London and attended

meetings of the Committee of Imperial Defence, as well as conferring with representatives of the Admiralty. As a result of this visit, His Majesty's Government, at the request of Mr. Borden, instructed the Admiralty to prepare a statement showing the present and the immediately prospective requirements for the naval defence of the Empire. Having considered the memorandum, which was forwarded to the Canadian Government by the Admiralty, Mr. Borden announced in the Canadian House of Commons his determination to ask Parliament to vote £7,000,000 for the immediate construction of three of the largest ships of war that science can build and money supply. He further announced his intention of placing the proposed ships at the disposal of the Imperial Government for the common defence of the Empire, to be controlled and maintained as part of the Royal Navy.

This policy was vehemently opposed in the Canadian House of Commons by Sir Wilfrid Laurier and his party. Mr. Borden's policy apparently was based on the conception of fostering Imperial Federation by the creation of a great Imperial Fleet controlled as a single fighting organization. As a corollary to this conception he looked forward to the time when the Dominions should have a voice in the control of Imperial foreign policy.

Sir Wilfrid Laurier opposed this idea, preferring that Canada should have no voice in the direction of Imperial foreign policy, and that she should reserve to herself the right to take part in a war or not, according as to whether she approves or not of the cause for which the war is waged. The logical conclusion from his political views is his advocacy of a Canadian Navy, primarily for the protection of Canadian interests, which could be placed at the disposal of the Imperial Government on the outbreak of war should the Canadian Parliament so decide.

Mr. Borden passed his Navy Bill through the Canadian House of Commons in May 1913, but it was thrown out by the Senate till such time as the policy has received the approval of the Canadian people at a general election.

In the meanwhile, Mr. Winston Churchill, who had frequently stated in Parliament that the proposed Canadian ships were not surplus to the 'whole world requirements' of Imperial Naval Defence, announced the Government's intention of accelerating the Admiralty building programme by laying down three battleships in 1913 instead of 1914. Mr. Borden stated that should he be successful later in passing his Naval Bill he would acquire the three battleships that he originally proposed from the Imperial Government.

Canadian land forces.

The Canadian military organization[1] consists of :

The Permanent Militia.
The Active Militia.
Police.
Rifle Clubs.
Cadet Corps.

The whole of the able-bodied male population between the ages of 18 and 60 years is liable for service in the Militia. Such men as are not serving compose the Militia Reserve. The Militia can only be called upon as an organized body to serve in the defence of Canada, but provision is made to allow individual militiamen to volunteer for service in any part of the Empire. There are, however, no units formed with this special object available to proceed overseas at short notice.

The Permanent Militia consists of :

Staff.
2 Squadrons of Cavalry.
1 Squadron of Mounted Rifles.
2 Batteries, Horse Artillery.
5 Companies, Garrison Artillery.
Engineers.
10 Companies of Infantry.
Army Service Corps.
Army Medical Corps.
Army Veterinary Corps.
Ordnance Corps.
Army Pay Corps.

[1] The legal aspects of military service are considered in Chapter IX.

The strength in all is about 270 officers and 2,700 other ranks.

The proportion of officers is high on account of the staff and instructional duties that fall to their lot in connexion with the Active Militia. The majority of the officers are educated at the Royal Military College, Kingston, which was established in 1876 to give cadets a complete military education and to afford a practical and scientific training in civil engineering, surveying, and physics. The course is for three years and there is accommodation for 100 cadets. All first appointments to commissions in the Royal Canadian Artillery and Engineers, and every alternate commission in the permanent cavalry and infantry, are offered to graduates of the College. Seven commissions are offered to graduates annually in the Regular Army at home.

The Permanent Forces, as their name implies, train throughout the year, and complete annually the course of musketry laid down for the Regular Army at home. A school of musketry has been established near Ottawa, at which two courses are held annually on the lines of the courses of instruction at Hythe.

The Active Militia consists of :

Staffs.
31 Regiments of Mounted Troops.
10 Brigades of Field Artillery.
4 Regiments of Garrison Artillery.
2 Regiments of Heavy Artillery.
5 Field Companies
3 Field Troops
1 Wireless Detachment
} of Engineers.
44 Regiments of Infantry.
15 Companies of Army Service Corps.
21 Field Ambulances, &c., Army Medical Corps.
Signalling Corps.
Veterinary Corps.
Corps of Guides.

The total strength is approximately 3,850 officers and 44,500 other ranks. The regiments and corps are little

more than cadres, the average strength of a regiment of infantry being about 250 men.

The Cavalry, Artillery, and Army Service Corps train annually for 16 days, other arms and departments for 12 days. A musketry course is carried out annually on the lines of the course laid down for the Territorial Force at home. Rural Corps do their training in camp. City Corps do theirs by means of drills at regimental head-quarters, each drill being of not less than two hours' duration. Courses of instruction are held throughout the year for officers and non-commissioned officers at permanent and provisional schools of instruction.

The Royal North-West Mounted Police[1] was raised in 1873 for the maintenance of law and order in the North-West Territories. The force, which is commanded by a Commissioner, whose head-quarters are at Regina, is organized in 12 divisions, the present strength being about 650 (all ranks). The term of engagement is five years, and the force is permanently employed and trained as cavalry.

There are in Canada about 430 Civilian Rifle Associations with 24,000 members. Every member in case of emergency becomes a member of the Militia.

There are, in addition, about 270 Cadet Corps, with an authorized establishment of 20,000 cadets, which will probably soon be considerably augmented. The cadets are divided into seniors (14 to 18 years of age) and juniors (12 to 14 years of age). The provincial governments of Nova Scotia, New Brunswick, and Ontario include compulsory drill and rifle shooting in the curriculum of colleges and schools under their control.

It will be seen from the above that no serious preparations are made in Canada to provide against the contingency of war with her formidable neighbour. Nor are any military forces maintained that are suitable for employment for the wider task of Imperial Defence. It would again be necessary to improvise such forces on the outbreak of war, as was the case in 1899. Mr. Borden's naval policy, however, shows the extent to which a large

[1] More fully dealt with in Chapter IX.

section of his countrymen appreciate the needs of Imperial Defence, and understand the principles on which it is based, and also the sacrifices they are prepared to make in the interests of the Empire.

The West Indies and the Panama Canal

Before considering the strategical effect of the opening of the Panama Canal on interests affecting the Empire, it is necessary first of all to appreciate the effect it will have on ocean trade routes. The only portion of the Empire outside the American continent that will be brought nearer to London or Liverpool than at present is New Zealand. For Australia and the ports in the Far East the route by the Suez Canal is considerably the shorter. Ocean trade routes to British ports will, therefore, only be shortened in the case of New Zealand and ports on the west coast of North, Central, and South America, and in the last-named case the Canal dues will probably cause the route via Cape Horn to be preferred for all ports south of Valparaiso. A considerable volume of trade from the East Indies, China, Japan, Australia, and New Zealand consigned in British bottoms to ports on the east coast of North, Central, and South America will no doubt use the Canal.

The above forms a very small proportion of the seaborne trade of the Empire (see Map, Fig. 1, in Vol. VI), and the country that will benefit most, both commercially and strategically, by the opening of the Canal will be the United States. The Canal is being constructed by the United States, will be under their control, and will be fortified and garrisoned by that country, to the interests of which those of the British Empire will occupy a subordinate position.

There are two aspects of the strategical questions involved in the opening of the Canal, which call for consideration :

(i) The position in the Caribbean Sea in the event of war with the United States.

(ii) The protection of our trade through the Canal in the event of war with some other Power.

As regards the first of these, it is not necessary to labour the point that the possibility of war with the United States is not a contingency which has much influence on our defensive arrangements. It is only proposed, as in other cases, to consider the purely strategical aspects of the question, but if such a contingency were by any chance to arise we must recognize that the Canal will probably be heavily fortified and strongly garrisoned. The task of attacking it with a view to its capture would involve costly siege operations which could not be carried out till we had obtained command of the Atlantic and the Caribbean Sea. The British interests involved, as shown above, hardly point to the Canal being a suitable objective for our principal operations, but if we do not attack it we must make up our minds to its remaining closed to our commerce throughout the war. As long, however, as it remains open to the commerce of the enemy his vessels using it form a vulnerable objective for our fleet.

A reference to a map of the Caribbean Sea shows that the island of Jamaica commands the Windward Passage and is nearer to the Yucatan Channel and the Mona and Anegada Passages than is Panama. Ships using the Canal bound for the Atlantic ports of the United States must use one or other of these passages unless they make a wide detour by the Windward Islands. The value of Jamaica as a base of operations against the commerce of the United States using the Canal is therefore apparent, but only if we have sufficient naval force at our disposal to establish command of the Caribbean Sea. The island of Jamaica is faced by the harbour of Santiago de Cuba. A superior fleet based on this port would deny to us the Windward Passage, bottle us into the Caribbean Sea, and render our position at Kingston, Jamaica, precarious. A first necessity of the situation, therefore, would be that Kingston, Jamaica, should be able adequately to fulfil the functions of a naval base for a fleet of sufficient strength for our purpose.

To appreciate the questions involved in the protection

of our trade through the Canal in the event of war with any other Power it is necessary again to refer to the chart. Ships using the Canal, moving from the Pacific to the Atlantic, are, broadly speaking, bound for one of three destinations : (i) ports on the east coast of Mexico, the United States, or Canada ; (ii) Europe ; (iii) South Africa or the east coast of South America. In the first case vessels will use either the Yucatan Channel or the Windward Passage ; in the second case they will use either the Mona or the Anegada Passage, west or east of Puerto Rico ; and in the third case they will use one of the channels in the Windward Islands. The importance of our being in a position to prevent a potential enemy from dominating one or other of these passages is easy to recognize. Probably the best way to do so is to foster a good understanding with the United States and to support them in their application of the Monroe doctrine to the West Indian Islands. Our interests are best served by the maintenance of the status quo and the prevention of any other Power from establishing a new fortified harbour commanding any of the principal ocean routes.

In Jamaica we already have a suitable base for the protection of our commerce, and we are interested only to see that no possible enemy undermines our sea power in this part of the world.

GAZETTEER OF TOWNS

(*Note.*—The towns included in this list have been selected partly on a basis of population, but also, especially in the case of certain smaller towns, with reference to their importance in relation to the localities in which they are situated.

The figures for latitude and longitude are approximate. The figures for population are in accordance with the latest available census returns, and the increase or decrease per cent., which in some cases follows these figures, and those for the value of industrial products (which are for the year 1910) cover the period of the preceding decade. The titles of Canadian railways are indicated by initials. Alta.=Alberta ; B.C., British Columbia ; Man., Manitoba ; N.B., New Brunswick ; N.S., Nova Scotia ; Ont., Ontario ; Que., Quebec ; Sask., Saskatchewan.)

CANADA

Amherst, 45° 47′ N., 64° 17′ W., N.S., seaport, at the head of Cumberland Basin, an arm of the Bay of Fundy, 138 m. N. of Halifax, on the I.C.R., is the centre of a farming district, with coal-mines and large timber areas. Has engineering works, and woollen, worsted, and timber mills. Pop. 8,973, increase 80·77 per cent.

Barrie, 44° 23′ N., 79° 43′ W., Ont., on Lake Simcoe, 63 m. NW. of Toronto, on G.T.R., has woollen, flour, and shingle mills, and manufactures of carriages, tobacco, and leather. Favourite summer resort. Pop. 6,420, increase 7·92 per cent.

Belleville, 44° 8′ N., 77° 22′ W., Ont., port of entry, on the Bay of Quinté, Lake Ontario, 113 m. E. of Toronto, on the G.T.R., is an important dairy centre, and has foundries, flour-mills, canning factories, and manufactures of jam, pottery, and cement. Pop. 9,876, increase 8·32 per cent.

Berlin, 43° 28′ N., 80° 29′ W., Ont., 60 m. W. of Toronto, on the C.P.R., G.T.R., and C.N.R., is the centre of an excellent agricultural district. Industries include tanneries, furniture, shoes, sugar, and motor-car tyre works. Value of products £1,905,000, increase 180·15 per cent. Pop. 15,196, increase 55·9 per cent.

Brandon, 49° 50′ N., 99° 50′ W., Man., on the Assiniboine River, 132 m. W. of Winnipeg, on the C.P.R., C.N.R., and G.N.R., has grain elevators, flour-mills, stock-yards, breweries, and creameries ; Dominion Experimental Farm and Indian industrial school situated here. Pop. 13,839, increase 152·6 per cent.

Brantford, 43° 8′ N., 80° 15′ W., Ont., 58 m. SW. of Toronto, on G.T.R., C.P.R., and several other lines, has foundries, flour-mills, and important manufactures of agricultural implements, cement, leather, boots and shoes, motor-cars, and carriages. Value of products £3,260,000, increase 185·12 per cent. Pop. 23,132, increase 38·19 per cent.

Brockville, 44° 37′ N., 75° 46′ W., Ont., on the St. Lawrence River, 126 m. SW. of Montreal, on C.P.R., C.N.R., and G.T.R., has manufactures of agricultural implements, engines, motor boats, stoves, hardware, and

carriages; exports large quantities of dairy produce. Pop. 9,374, increase 3·74 per cent.

Calgary, 51° 2′ N., 114° 2′ W., Alta., in the valley of the Bow River, a tributary of the South Saskatchewan, 860 m. W. of Winnipeg, on the C.P.R., C.N.R., and G.T.R., is the trade and railway centre of a large agricultural and stock-raising district, and chief supply centre of mining district in the Rocky Mts. and British Columbia. Industries include flour-mills, breakfast foods, factories, saw-mills, tanneries, meat-packing establishments, and large railway workshops of the C.P.R. Extensive coal beds, lime, brick clay, building stone, and natural gas in the neighbourhood. Value of products £1,590,000, increase 1,193·0 per cent. Seat of Anglican bishop. Pop. 43,704, increase 893·72 per cent.

Charlottetown, 46° 14′ N., 63° 10′ W., seaport and capital of Prince Edward Island, on Hillsborough Bay in Northumberland Strait, at the confluence of three rivers, has an excellent harbour. Industries include pork-packing, condensed milk, fishing, lobster-packing, saw-mills, and iron foundries. Seat of a Roman Catholic bishop. Pop. 11,203, decrease 7·17 per cent.

Chatham, 42° 24′ N., 82° 11′ W., Ont., on the river Thames, which is here navigable, 13 m. N. of Lake Erie, 180 m. SW. of Toronto, on the C.P.R., G.T.R., and other lines, is the centre of a good farming and fruit district. Industries include flour and woollen mills, fruit-canning, and the manufacture of wagons, carriages, and butter. Value of products £1,035,000, increase 85·03 per cent. Pop. 10,770, increase 18·77 per cent.

Chicoutimi, 48° 27′ N., 71° W., Que., on the Saguenay River, 227 m. NE. of Quebec, on C.N.R., has large timber and pulp mills, furniture and wooden-ware factories, tanneries, creameries and cheese factories, and foundries. Seat of Roman Catholic bishop. Pop. 5,880, increase 53·69 per cent.

Cobalt, 47° 50′ N., 79° 45′ W., Ont., on Cobalt Lake, 330 m. by rail N. of Toronto, is the centre of a district containing the richest silver ores in the world; the ores contain also cobalt, nickel, and arsenic. Pop. 5,638.

Cobourg, 43° 58′ N., 78° 9′ W., Ont., port of entry, on Lake Ontario, 69 m. ENE. of Toronto, on G.T.R. and C.P.R., has manufactures of steel rails, railway carriages, and woollen mills; favourite summer resort. Pop. 5,074, increase 19·7 per cent.

Collingwood, 44° 30′ N., 80° 13′ W., Ont., port of entry, on Georgian Bay, Lake Huron, 78 m. NW. of Toronto, on G.T.R., has timber mills, tanneries, foundries, meat-packing, nail and furniture factories, ship yards, and trade in grain and timber. Pop. 7,090, increase 23·19 per cent.

Cornwall, 45° 3′ N., 74° 43′ W., Ont., port of entry, on the St. Lawrence River, terminus of Cornwall Canal, 56 m. SE. of Ottawa, on the G.T.R. and other lines, has cotton, woollen, flour, paper, and saw mills, foundries, lacrosse factory, and manufactures of furniture, stoves, bedsteads, and clothing. Pop. 6,598, decrease 1·58 per cent.

Edmonton, 53° 33′ N., 113° 30′ W., capital of Alberta, on the North Saskatchewan River, 793 m. NW. of Winnipeg, on C.P.R., G.T.R., and C.N.R., is centre of an important coal area, 30 coal-mines being worked in or near the city, and of rich farming district. Industries include meat-packing, flour-mills, grain elevators, saw-mills, brick-yards, foundries, and brewing. Seat of University of Alberta and of Roman Catholic seminary. Pop. 24,900, increase 848 per cent. In 1912 it had 53,383 inhabitants, including Strathcona situated on the opposite side of the river, which has been incorporated with it.

Fort William, 48° 23′ N., 89° 20′ W., Ont., port of entry at the head of navigation on Lake Superior, 426 m. by rail ESE. of Winnipeg, on C.P.R., G.T.R., and C.N.R., has large transhipment trade, being the gateway to the wheatfields of Western Canada. Has large elevators, flour and timber mills, iron foundries, brick and cement works, and shipbuilding; large blast furnaces, and silver and copper mines in the neighbourhood. Pop. 16,499, increase 354 per cent.

Fraserville (Rivière du Loup), 47° 52′ N., 69° 35′ W., Que., picturesquely situated at the confluence of the Rivière du Loup with the St. Lawrence, 118 m. NE. of Quebec, on the I.C.R., is a favourite summer resort, with good fishing and caribou shooting in the neighbourhood. Industries include grist-mills, pulp-mills, butter factories, and railway workshops. Pop. 6,774, increase 48·26 per cent.

Fredericton, 45° 57′ N., 66° 36′ W., capital of New Brunswick, on St. John River, 54 m. NW. of St. John, on C.P.R. and I.C.R., has timber mills, foundries, and manufactures of canoes, motor boats, leather, and boots and shoes. Seat of university, and of Anglican bishop. Pop. 7,208, increase 1·28 per cent.

Galt, 43° 23′ N., 80° 20′ W., Ont., 60 m. WSW. of Toronto, on C.P.R. and G.T.R., is the centre of an agricultural district, with supplies of timber, limestone, and sand. Manufactures include agricultural implements, brass goods, engines and boilers, carriages, and leather. Value of products £1,079,000, increase 136·0 per cent. Pop. 10,299, increase 30 93 per cent.

Glace Bay, 46° 12′ N., 59° 58′ W., N.S., seaport, on bay of same name, is an important coal-mining centre; industries also include machine works, wood-working factories, and fishing. Pop. 16,562, increase 138·47 per cent.

Guelph, 43° 33′ N., 80° 16′ W., Ont., 48 m. W. of Toronto, on C.P.R., G.T.R., and C.N.R., is the centre of one of the finest agricultural districts in the province; seat of famous Agricultural College and experimental farm attached to it. Manufactures include agricultural implements, malleable iron, rubber, wagons and carriages, pianos, organs, sewing machines, cotton and woollen goods, clothing, and breweries. Value of products £1,520,000, increase 100·37 per cent. Pop. 15,175, increase 32·0 per cent.

Halifax, 44° 39′ N., 63° 36′ W., seaport and capital of Nova Scotia, picturesquely situated on a peninsula enclosed by a magnificent harbour, which is open all the winter; Atlantic terminus of I.C.R., with excellent harbour facilities. Industries include iron foundries, sugar refineries, brewing, distilling, and the manufacture of machinery, agricultural implements, paper, cotton and woollen goods, tobacco, and musical instruments. Value of products £2,495,000, increase 75·25 per cent. Seat of Anglican bishop and Roman Catholic archbishop. Pop. 46,619, increase 14·17 per cent.

Hamilton, 43° 16′ N., 79° 55′ W., Ont., situated at the western extremity of Lake Ontario, 39 m. SW. of Toronto, on the C.P.R., G.T.R., and other lines, has important industries of steel, iron, agricultural implements, electrical wires and cables, cotton and woollen goods, boots, and furniture. Value of products £11,330,000, increase 221·95 per cent. Seat of Anglican and Roman Catholic bishops. Pop. 81,969, increase 55·73 per cent.

Hull, 45° 27′ N., 75° 43′ W., Que., situated on north bank of Ottawa River, opposite Ottawa, on the C.P.R., has planing mills, pork-packing works, and manufactures of pulp, wooden wares, furniture, and cement. Value of products £1,492,000, increase 128·13 per cent. Pop. 18,322, increase 30·22 per cent.

Joliette, 46° 4′ N., 73° 30′ W., Que., on the Assomption River, 36 m. NE. of Montreal, on C.P.R., has saw and paper mills, and manufactures of tobacco, steel, iron, chemicals, and woollen goods. Seat of Roman Catholic bishop. Pop. 6,346, increase 50·38 per cent.

Kenora, 49° 50′ N., 94° 40′ W., Ont., situated on the Lake-of-the-Woods, where its waters issue into the Winnipeg River, 133 m. E. of Winnipeg, on C.P.R., is a summer and tourist resort, and has timber and flour mills, grain elevators, and boat-building industry. Pop. 6,158, increase 18·58 per cent.

Kingston, 44° 15′ N., 76° 35′ W., Ont., port of entry situated at the point where the St. Lawrence River leaves Lake Ontario, 185 m. E. of Toronto, on G.T.R., has foundries, boat-building, flour and cotton mills, cereal foods, factories, and breweries. Seat of Anglican and Roman Catholic bishops, of a university, and of a military college. Pop. 18,874, increase 5 per cent.

Lachine, 45° 28′ N., 73° 40′ W., Que., port of entry situated on Lake St. Louis, part of the St. Lawrence River, 8 m. SW. of Montreal, with which it is connected by a canal, 9 miles long, through which all the water-borne commerce between that city and the west passes, in order to avoid the famous Lachine Rapids on the St. Lawrence. Served by the C.P.R. and G.T.R. Industries include large electric power plants, steel and iron works, boat-building, and manufactures of wire, carriages, wooden wares, and pickles. Value of products £1,294,000, increase 116·36 per cent. Pop. 10,699, increase 92·21 per cent.

Lethbridge, 49° 48′ N., 112° 42′ W., Alta., on the Belly River, 144 m. SE. of Calgary, on the C.P.R. and G.N.R., is the centre of an important coal-mining district and the trading centre of a large agricultural district; has grain elevators and flour-mills; Dominion Government Experimental Farm situated here. Pop. 8,050, increase 288·5 per cent.

Levis, 46° 49′ N., 71° 12′ W., Que., situated on the St. Lawrence River, opposite Quebec, on the G.T.R. and I.C.R., has tanneries, shipyards, saw-mills, and manufactures of boots and shoes and tobacco. Pop. 7,452, decrease 4·25 per cent.

London, 43° 1′ N., 81° 17′ W., Ont., on the river Thames, 115 m. SW. of Toronto, on C.P.R., G.T.R., and other lines, is centre of a very rich farming district. Manufactures include iron and brass works, tinware, agricultural implements, furniture, chemicals, petroleum refining, and breweries. Value of products £3,344,000, increase 100·36 per cent. Seat of university, and of Anglican and Roman Catholic bishops. Pop. 46,300, increase 21·92 per cent.

Maisonneuve, 45° 40′ N., 73° 40′ W., Que., situated on the St. Lawrence River, a few miles NW. of Montreal, may be considered as an industrial suburb of Montreal, where many industries similar to those of Montreal (q. v.) are carried on. Value of products £4,275,000; increase 246·39 per cent. Pop. 18,684, increase 372 per cent.

Medicine Hat, 50° 8′ N., 110° 30′ W., Alta., on the South Saskatchewan River, 660 m. W. of Winnipeg, on the C.P.R., has grain elevators, foundries, flour, steel, and iron mills, and manufactures of pencils, glass, and clay products; coal, good clay, and natural gas in the neighbourhood. Pop. 5,608, increase 257 per cent.

Moncton, 46° 5′ N., 64° 48′ W., N.B., port situated at the head of navigation of the Petitcodiac River, which flows in the Bay of Fundy, 89 m. NE. of St. John, is the Atlantic terminus of Grand Trunk Pacific Railway, and also the head-quarters of the Intercolonial Railway. Industries include the workshops of the Intercolonial Railway, and manufactures of cotton, wire

flour, and wooden wares; oil and natural gas in the neighbourhood. Pop. 11,345, increase 25·7 per cent.

Montreal, 45° 30′ N., 73° 35′ W., Que., the principal port of entry and the first commercial and industrial city of Canada, is situated on the south-eastern side of the island of Montreal, at the junction of the Ottawa and St. Lawrence rivers. It stands at the head of sea-going navigation, nearly 1,000 m. inland, and at the foot of the extensive system of rivers, lakes, and canals which carry commerce between the interior of Canada and the Atlantic seaboard. The harbour, one of the finest in the world, offers extensive accommodation with over 7 m. of deep water wharfage, which permits the passage of vessels drawing 30 ft. at low water, and is provided with all modern facilities. About one-third of the total imports and exports of Canada passes through it, the leading articles among exports being grain and dairy produce. It is the head-quarters of the C.P.R. and G.T.R., and is also on the C.N.R., the I.C.R., and several other lines. Principal industries include sugar refineries, iron works of all kinds, machinery, railway carriages, sewing machines, cotton and woollen goods, silk, clothing, rubber, meat-packing, flour-mills, and breweries. Value of products £34,200,000, increase 133·89 per cent. It is the seat of McGill University and of a branch of the University of Laval (see Quebec), and of Anglican and Roman Catholic bishops. Pop. 470,480, increase 75·73 per cent.; birth-rate (1906–10) 37·1 per thousand, death-rate 22·6 per thousand.

Moosejaw, 50° 20′ N., 105° 35′ W., Sask., situated at the junction of Moosejaw and Thunder Creek Rivers, 308 m. W. of Winnipeg, on the C.P.R. and C.N.R., has flour and oatmeal mills, stock-yards, steel works, wooden-ware manufactures and tanneries; coal and clay in the neighbourhood. Pop. 13,823, increase 787·23 per cent.

Nanaimo, 49° 10′ N., 124° W., B.C., seaport, situated on the east coast of Vancouver Island, on a fine natural harbour, 35 m. by sea W. of Vancouver, is an important coal-mining town; has saw-mills and large fishing and curing establishments; large exports of salted herring to the Far East; copper in the neighbourhood. Pop. 8,306, increase 35·5 per cent.

Nelson, 49° 29′ N., 117° 21′ W., B.C., situated at termination of navigation on western arm of Kootenay Lake, on C.P.R. and G.N.R., is centre of fruit and mining district, and also favourite tourist resort. Has iron works, boat-building, and jam factories. Pop. 4,476, decrease 17 per cent.

New Glasgow, 45° 41′ N., 62° 39′ W., N.S., on the I.C.R., 8 m. by rail SE. of Pictou Landing on Northumberland Strait, is the centre of a district rich in coal, iron ore, and limestone, and has large steel works, glass works, and timber mills. Pop. 6,383, increase 43·5 per cent.

New Westminster, 49° 13′ N., 122° 54′ W., B.C., situated on the Fraser River, 13 m. from the Pacific Ocean, 12 m. ESE. of Vancouver, on the C.P.R., G.N.R., and C.N.R., is the only freshwater port of western Canada, one of the oldest settlements in the province, and the seat of an Anglican bishop. Industries include fishing, salmon canning, dairying, saw and paper mills, boiler works, shipyards and railway workshops. Pop. 13,199, increase 103 per cent.

Niagara Falls, 43° 12′ N., 79° 9′ W., Ont., situated on the west bank of the Niagara River, below the falls, opposite the city of the same name in the United States, 82 m. S. of Toronto, on the C.P.R., C.N.R., G.T.R., and several other lines, being the junction of lines from the United States with the Canadian trunk lines. Has extensive hydro-electric works for generating

power, and its manufactures include cereal foods, carborundum, graphite, aluminium wares, chemicals, creameries, and iron foundries. Pop. 9,248, increase 62 per cent.

Orillia, 44° 35′ N., 79° 25′ W., Ont., situated on Lake Conchiching, on G.T.R., C.P.R., and C.N.R., is the centre of a fruit and farming district, and also a favourite tourist resort. Has foundries, flour, woollen, and pulp mills, and manufactures of carriages, furniture, and motor-cars. Pop. 6,828, increase 39·15 per cent.

Oshawa, 43° 52′ N., 78° 56′ W., Ont., port of entry on Lake Ontario, 35 m. NE. of Toronto, on G.T.R., C.N.R., and C.P.R., is the centre of a fruit and farming district, producing sugar beetroot of good quality. Has flour-mills, canning factories, foundries, tanneries, and a piano factory. Pop. 7,436, increase 69·46 per cent.

Ottawa, 45° 26′ N., 75° 40′ W., Ont., capital of the Dominion of Canada, one of the finest cities on the American continent, picturesquely situated on the Ottawa River, on the C.P.R., G.T.R., and C.N.R. It contains amongst other educational establishments a university (Roman Catholic), astronomical observatory, and an experimental farm; seat of Anglican and Roman Catholic archbishops. Industries include iron works and foundries, timber, paper, and flour mills, and manufactures of agricultural implements, carbide, marine gas-buoys, clothing, bricks, and cement; centre of large timber trade. Value of products £4,300,000, increase 173·92 per cent. Pop. 87,062, increase 45·27 per cent.

Owen Sound, 44° 33′ N., 81° 4′ W., Ont., situated at mouth of Sydenham River, on Georgian Bay, 122 m. NW. of Toronto, on C.P.R. and G.T.R., has one of the best harbours on Lake Huron. Industries include flour and saw mills, foundries, tanneries, manufactures of cement, agricultural implements, and furniture, grain elevators, and cold storage plants. Pop. 12,558, increase 43·95 per cent.

Peterborough, 44° 17′ N., 78° 19′ W., Ont., situated on the Otonabee River, which descends here 150 ft. within a few miles and affords motive power for numerous mills, 70 m. NE. of Toronto, on the C.P.R. and G.T.R., and the Trent Canal, is the trade centre of a flourishing agricultural district. Industries include timber and flour mills, manufactures of electric machinery and supplies, cereal foods, agricultural implements, sails, and carpets, pork-packing, and canoe factories. Value of products £2,180,000, increase 180·62 per cent. Seat of a Roman Catholic bishop. Pop. 18,360, increase 63·36 per cent.

Portage La Prairie, 49° 58′ N., 98° 17′ W., Man., 56 m. W. of Winnipeg, an important railway junction, situated on the C.P.R., C.N.R., G.T.R., and G.N.R., is an important centre of the grain trade. Has grain elevators, flour and oatmeal mills, and manufactures of farm implements, radiators and steam-heating supplies, and bricks, and timber yards. Pop. 5,892, increase 51 per cent.

Port Arthur, 48° 23′ N., 89° 15′ W., Ont., port of entry, at the head of navigation on Lake Superior, is situated almost half-way across Canada, being 1,700 m. from the Atlantic coast, and 1,900 m. from the Pacific coast, 424 m. ESE. of Winnipeg, on the C.P.R., C.N.R., G.T.R., and other lines, 4 m. NE. of its sister port, Fort William. Is the centre of a rich agricultural district, which contains also extensive beds of iron ore and numerous waterfalls. Has large grain elevators, blast furnaces, shipbuilding and railway workshops. Pop. 11,220, increase 249 per cent.

Prince Albert, 53° 8′ N., 106° 5′ W., Sask., on North Saskatchewan River, 250 m. NNW. of Regina, on C.N.R., G.T.R., and C.P.R., is the centre of an extensive forest region extending northward for about 2,000 sq. m. Has saw and planing mills, flour-mills, boat-building and brick plants. Seat of Roman Catholic bishop. Pop. 6,254, increase 250·36 per cent.

Prince Rupert, 54° 20′ N., 130° 25′ W., B.C., seaport situated on the Tsimpsean Peninsula, 550 m. NW. of Vancouver, is the western terminus of the Grand Trunk Pacific Railway, and has an excellent non-tidal harbour. Seat of an Anglican bishop. Pop. 4,184.

Quebec, 46° 48′ N., 71° 13′ W., port of entry and capital of Quebec, perhaps the most picturesque city in America, situated on the steep north bank of the St. Lawrence, at its junction with St. Charles River, 180 m. NE. of Montreal. It has a spacious harbour, one of the best in America, closed during winter (middle December–middle April), and is on C.P.R., G.T.R., C.N.R., and several other lines. Principal industries include saw-mills, tanneries, and manufactures of furniture, boots and shoes, cotton goods, tobacco, and biscuits; large exports of timber, furniture, and grain. Value of products £3,525,000, increase 34·19 per cent. Seat of the French University of Laval, and of an Anglican bishop and of Roman Catholic archbishop. Pop. 78,710, increase 13·58 per cent.

Regina, 50° 27′ N., 104° 37′ W., capital of Saskatchewan, 358 m. WNW. of Winnipeg, on C.P.R. and C.N.R., is the principal distributing point in the middle west, and the centre of a rich agricultural district. Industries include flour-mills, stock-yards, tanning, foundries, and grain elevators. Seat of Anglican and Roman Catholic bishops. Pop. 30,213, increase 1,243·4 per cent.

St. Boniface, 49° 50′ N., 97° 6′ W., Man., situated on the Red River, opposite Winnipeg, great railway junction; has large grain elevators, timber, flour, and linseed oil mills, stock-yards, and breweries. Seat of Roman Catholic archbishop. Pop. 7,483, increase 270 per cent.

St. Catharines, 43° 11′ N., 79° 14′ W., Ont., 71 m. SSE. of Toronto, on the G.T.R. and the Welland Canal, is the centre of the fruit belt of Ontario. Industries include paper, planing and flour mills, biscuit-making, fruit-canning, and agricultural implement works. Value of products £1,237,000, increase 190·95 per cent. Has saline springs, efficacious against rheumatism, gout, and skin diseases. Pop. 12,484, increase 24·51 per cent.

St. Hyacinthe, 45° 35′ N., 72° 59′ W., Que., 36 m. E. of Montreal, on the C.P.R., G.T.R., and I.C.R., has manufactures of agricultural implements, leather, organs, boots and shoes, wooden wares, corsets, and woollen goods. Seat of Roman Catholic bishop, and of a seminary. Pop. 9,797, increase 5·72 per cent.

St. John, 45° 14′ N., 66° 3′ W., N.B., seaport on the Bay of Fundy, at the mouth of St. John River, terminus of C.P.R. and I.C.R., is open all the year round, and disputes with Halifax the position of the first winter port of Canada. Industries include timber, cotton, paper, and flour mills, shipbuilding, steel, iron, engine and boiler works, tanneries, fish-curing, and manufactures of nails, brushes, and soap. Value of products £2,072,000, increase 50·19 per cent. Seat of Roman Catholic bishop. Pop. 42,511, increase 4·42 per cent.

St. Thomas, 42° 29′ N., 81° 16′ W., Ont., 130 m. SSW. of Toronto, on G.T.R., C.P.R., and other lines, is centre of a rich agricultural and fruit belt. Industries include railway workshops, planing and flour mills, iron,

steel, and brass works, and manufactures of biscuits and shoes. Pop. 14,054, increase 22·37 per cent.

Sarnia, 42° 57′ N., 82° 35′ W., Ont., at the mouth of St. Clair River, on Lake Huron, 170 m. SW. of Toronto, on G.T.R., is centre of a district supplying salt, timber, and petroleum. Industries include saw-mills, oil refineries, salt works, and manufactures of carriages, lubricants, and furniture. Pop. 9,947, increase 9·41 per cent.

Saskatoon, 52° 10′ N., 106° 50′ W., Sask., on South Saskatchewan River, 466 m. WNW. of Winnipeg, on the C.P.R., C.N.R., and G.T.P.R., a fast-growing centre of a rich agricultural district; has saw and flour mills, wooden-ware factories, and foundries. Seat of a university, agricultural college, and experimental farm. Pop. 12,004 (in 1901, 113).

Sault Ste Marie, 46° 30′ N., 84° 23′ W., Ont., on the St. Mary's River, which connects Lakes Huron and Superior, 397 m. NW. of Toronto, on C.P.R., has large iron, steel, paper, and saw mills. Seat of Anglican and Roman Catholic bishops. Pop. 10,984, increase 53·22 per cent.

Sherbrooke, 45° 25′ N., 71° 57′ W., Que., situated at the confluence of Magog and St. Francis Rivers, 101 m. ESE. of Montreal, on the C.P.R., G.T.R., and other lines, is centre of a district containing asbestos and copper mines and pulp-mills. It has also manufactures of machinery, woollen goods, carpets, wooden wares, and grist-mills. Seat of Roman Catholic bishop. Pop. 16,405, increase 39·44 per cent.

Sorel, 46° 2′ N., 73° 10′ W., Que., situated on Richelieu River at its mouth in Lake St. Peter, St. Lawrence River, 45 m. NE. of Montreal, on the C.P.R., has saw-mills, shipbuilding, agricultural implement works, foundries, and wooden-ware factories. Pop. 8,420, increase 19·31 per cent.

Stratford, 43° 24′ N., 81° W., Ont., important railway junction, 88 m. SSW. of Toronto, on the G.T.R., is trade centre of large agricultural district, with manufactures of agricultural implements, flour, biscuits, dairy supplies, furniture, pork-packing, and railway workshops. Value of products £1,056,000, increase 165·29 per cent. Pop. 12,946, increase 29·99 per cent.

Sudbury, 46° 40′ N., 81° W., Ont., situated 312 m. WNW. of Ottawa, on the C.P.R., is the centre of a district possessing rich deposits of nickeliferous pyrrhotite, the ore containing, besides nickel, cobalt, copper, and platinum. There are smelting works and timber mills. Pop. 4,150, increase 106 per cent.

Sydney, 46° 8′ N., 60° 10′ W., N.S., seaport, situated on Sydney Harbour, one of the best on the Atlantic coast, on the I.C.R., is the centre of a district rich in coal, iron, copper, marble, limestone, and timber, and has large steel plants, manufactures of machinery, stoves, chemicals, cement and bricks, and marble works. Value of products £1,930,000, increase 1,387·97 per cent. Pop. 17,723, increase 78·76 per cent. Sydney Mines (pop. 7,470) lies 3 m. W., and North Sydney (5,418), a coal-shipping port, 5 m. N.

Thetford Mines, 46° 5′ N., 71° 20′ W., Que., 76 m. SSW. of Quebec, on Quebec Central Railway, has asbestos and chrome-iron mines. Pop. 7,261, increase 123 per cent.

Toronto, 43° 40′ N., 79° 24′ W., capital of Ontario, situated on the north shore of Lake Ontario, on a spacious inlet called the Bay of Toronto, forming a commodious harbour, 333 m. SW. of Montreal, on the C.P.R., G.T.R., and C.N.R. Toronto is the second commercial and industrial city of the Dominion, its industries including agricultural implement works, iron foundries, flour-mills, wood products, leather, brewing and distilling, ship-building, and piano works; largest publishing centre. Value of products

£31,700,000, increase 164·15 per cent. Chief exports, timber, grain, heating appliances, and agricultural implements. Seat of a university and of Anglican and Roman Catholic bishops. Pop. 376,538, increase 80·99 per cent.; birth-rate (1906–10) 30·8 per thousand, death-rate 18·2 per thousand.

Trois Rivières (Three Rivers), 46° 20′ N., 72° 34′ W., Que., port of entry, situated at the junction of St. Maurice and St. Lawrence rivers, half-way (98 m.) between Quebec and Montreal, on C.P.R. and G.T.R., with a fine harbour, available for steamers drawing 30 ft. Industries include timber, pulp and cotton mills, foundries, tanneries, and manufactures of wooden wares, boots and shoes, and stoves. Seat of Roman Catholic bishop. Pop. 13,691, increase 37·17 per cent.

Truro, 45° 21′ N., 63° 18′ W., N.S., situated 2 m. from the head of Cobequid Bay, the easternmost arm of the Bay of Fundy, 62 m. NNE. of Halifax, on the I.C.R., is an important railway junction and centre of an agricultural district. Has manufactures of condensed milk, hats, woollen goods, and machinery; educational centre. Pop. 6,107, increase 1·9 per cent.

Valleyfield, 45° 14′ N., 74° 6′ W., Que., port of entry, on the St. Lawrence River, 30 m. SW. of Montreal, on the G.T.R. and other lines, is the centre of a district supplying timber, iron ore, and limestone. Industries include cotton, flour, timber, and paper mills, biscuit works, and foundries. Seat of Roman Catholic bishop. Pop. 9,449, decrease 14·53 per cent.

Vancouver, 49° 17′ N., 123° 5′ W., B.C., seaport and the largest city of the province, situated on Burrard Inlet, has one of the best deep-water harbours on the Pacific coast, and is the western terminus of the C.P.R., C.N.R., and G.N.R., and of several other railways. Industries include shipbuilding, railway workshops, foundries, steel works, flour and timber mills, salmon and halibut canneries, sugar refineries, and furniture factories; value of products £3,097,000, increase 202·3 per cent. Seat of Roman Catholic archbishop. Pop. 100,401, increase 271·7 per cent.

Victoria, 48° 24′ N., 123° 19′ W., seaport and capital of British Columbia, situated on south-eastern coast of Vancouver Island, 80 m. SW. of Vancouver, has the appearance of an English town, and is famous for its beauty and its equable climate. Has a university and is the seat of Anglican and Roman Catholic bishops. Is the head-quarters of the Canadian fur-sealing fleet, and its industries include fish-canning, shipbuilding, saw-mills, and furniture factories; coal, iron, and copper in the neighbourhood. Pop. 31,660, increase 51·35 per cent. Three miles north-west of Victoria is Esquimalt, a fine land-locked harbour, formerly only a naval harbour, but now open to merchant vessels.

Welland, 42° 59′ N., 79° 17′ W., Ont., situated on the Welland Canal, 82 m. S. of Toronto, on G.T.R. and other lines, has foundries, steel works, flour-mills, and manufactures of motor-cars, agricultural implements, stoves, brass and iron beds, and rope. Pop. 5,318, increase 184·91 per cent.

Windsor, 42° 20′ N., 83° W., Ont., port of entry, situated on Detroit River, near its entrance into Lake St. Clair, in waterway communication with the Great Lakes, 228 m. SW. of Toronto, on the C.P.R., G.T.R., and other lines, has large salt works, foundries, manufactures of chemicals, machinery, furniture, stoves, cereal foods and motor-cars, and saw-mills; salt and limestone in the neighbourhood. Pop. 17,829, increase 46·7 per cent.

Winnipeg, 49° 53′ N., 97° 7′ W., capital of Manitoba, situated at the junction of the Assiniboine with the Red River, occupies a commanding

position which makes it the gateway to the west. It is a great railway junction, transcontinental railways and 14 branch lines radiating from it, and through the Red River it has water communication with Lake Winnipeg. It is the largest grain market in the British Empire, and a great wholesale and distributing centre. All the railways have here large workshops, and among other industries are agricultural implement works, iron, steel, and wire works, timber and flour mills, meat-packing establishments, and manufactures of breakfast foods, furniture, wooden wares, jewellery, and harness. Value of products £7,220,000, increase 279·45 per cent. Is the seat of the University of Manitoba, and of an Anglican archbishop. Pop. 136,035, having more than trebled since 1901.

Woodstock, 43° 9′ N., 80° 46′ W., Ont., railway junction, 88 m. SW. of Toronto, on G.T.R. and C.P.R., is the centre of a rich agricultural district with good supplies of grain, wool, and hides. Has manufactures of agricultural implements, pianos, machinery, and wagons, and flour and timber mills. Pop. 9,320, increase 5·51 per cent.

Yarmouth, 43° 49′ N., 66° 6′ W., N.S., seaport, situated at the south-western extremity of Nova Scotia, 248 m. SSW. of Halifax, on C.P.R., is the gateway of Nova Scotia from the United States. Has large exports of timber, and its industries include shipbuilding, lobster-canning, and fishing; favourite summer resort. Pop. 6,600, increase 2·64 per cent.

NEWFOUNDLAND

Harbor Grace, 47° 41′ N., 53° 12′ W., seaport, on the W. side of Conception Bay, 26 m. by rail WNW. of St. John's, has nearly one-fourth of the trade of the colony. Seat of a Roman Catholic bishop. Pop. 4,279.

St. John's, 47° 33′ N., 52° 45′ W., seaport and capital, on the east side of the peninsula of Avalon, is the most easterly port of America, being only 2,300 m. from Liverpool. Its land-locked harbour, one of the best on the Atlantic coast, is accessible to the largest steamers at all tides. It is the centre of the cod, seal, and whale fisheries of the island, and its principal trade and industries are connected with fishing. Seat of a Roman Catholic archbishop and of an Anglican bishop. Pop. 32,292.

WEST INDIES, ETC.

Belize, 17° 29′ N., 88° 20′ W., chief seaport and capital of British Honduras, situated at the mouth of the Belize River, with an open roadstead but no harbour, on account of sand-bars, is the chief centre of the mahogany trade. Seat of Anglican and Roman Catholic bishops. Pop. 10,478.

Bridgetown, 13° 8′ N., 59° 33′ W., seaport and capital of Barbados, on the west coast, along the north-east shore of Carlisle Bay, has a spacious and safe roadstead but no harbour. Seat of Anglican bishop. Pop. 16,648.

Georgetown, 6° 29′ N., 58° 11′ W., seaport and capital of British Guiana, at the mouth of the Demerara River, has a large export in timber, sugar, coffee, and cocoa. Seat of Anglican and Roman Catholic bishops. Pop. 54,000.

Hamilton, 32° 15′ N., 64° 50′ W., capital of the Bermuda Islands, is situated on the island of Great Bermuda, or Main Island, in the inner part of the Great Sound. Pop. 2,624.

Kingston, 17° 55′ N., 76° 40′ W., capital and chief seaport of Jamaica, situated on the south-eastern coast of the island, with a fine land-locked harbour, has a dry and healthy climate, and is famous for its beautiful suburbs. Seat of an Anglican bishop. Pop. 57,379.

Port of Spain, 10° 38′ N., 61° 26′ W., seaport and capital of Trinidad, on the north-western coast of the island, facing the Gulf of Paria, has a fine harbour and is the chief distributing and shipping centre between the valley of the Orinoco, in Venezuela, and Europe. Considered one of the finest towns in the West Indies; seat of a Roman Catholic archbishop and of an Anglican bishop. Pop. 60,000.

Spanish Town, 18° 3′ N., 77° W., Jamaica, 12 m. by rail W. of Kingston, on the Cobre River, was until 1871 the capital of Jamaica. Pop. 7,119.

STATISTICS

By Harold Macfarlane

CANADA

LAND AND WATER AREAS

	Total area sq. m.	*Relation to area of United Kingdom.*	*Land area* sq. m.	*Water area* sq. m.
Alberta	255,285	2·1 : 1	252,925	2,360
British Columbia	355,855	2·93 : 1	353,416	2,439
Manitoba	251,832	2·098 : 1	231,926	19,906
New Brunswick	27,985	0·23 : 1	27,911	74
Nova Scotia	21,428	0·176 : 1	21,068	360
Ontario	407,262	3·014 : 1	365,880	41,382
Prince Edward I.	2,184	0·018 : 1	2,184	—
Quebec	706,834	5·822 : 1	690,865	15,969
Saskatchewan	251,700	2·079 : 1	243,382	8,318
Yukon	207,076	1·76 : 1	206,427	649
N.W. Territories	1,242,224	10·23 : 1	1,207,926	34,298
Total Canada	3,729,665	30·8 : 1	3,603,910	125,755

FORESTRY

The total forest area of Canada is said to be 835,000 square miles, or 22·33 per cent. of the total area. The area coming within the provisions of the Dominion Forest Reserves and Parks Act comprises 25,201½ square miles distributed over 25 districts. The average exports (1908–11) of timber aggregate £9,085,000 (United Kingdom, £2,290,000; United States, £5,890,000; and other countries, £905,000). A return for 1909 showed that 2,906 million cubic feet of material was cut per annum in Canadian forests, of an aggregate value of 34 millions sterling. (1911, 35 million; 1912, 37½ million).

The forest area is thus distributed: British Columbia, 285,000 square miles; Manitoba, Saskatchewan, Alberta, and the Territories, 281,000 square miles; Quebec, 187,500 square miles; Ontario, 62,500 square miles; New Brunswick, 12,000 square miles; and Nova Scotia, 7,000 square miles.

Exports of Forest Produce. Last Five Census Years

	United Kingdom.	*United States.*	*Total.*
	£1,000	£1,000	£1,000
1871	2,391	1,882	4,750
1881	3,033	1,716	5,129
1891	2,291	2,417	4,990
1901	3,219	2,508	6,170
1911	2,460	5,917	9,340
Increase or decrease per cent. in last intercensal period.			
	−23·6	+136	+51

AGRICULTURE

Average Area and Production of Chief Crops 1908–11

	1,000 *acres.*	1,000 *bushels.*	1912. 1,000 *ac.*		1,000 *acres.*	1,000 *bushels.*	1912. 1,000 *ac.*
Oats	9,082	319,000	9,217	Corn for husking	341	19,875	293
Hay	8,209·75	12,889·5*	7,634	Buckwheat	300	7,500	387
Wheat	8,506	161,000	9,758	Fodder Corn	279	2,708·75*	278
Barley	1,712	47,000	1,415	Turnips, &c.	245·75	97,250	227
Mixed grains	575	18,625	522	Rye	107	1,925	136
Potatoes	494·75	78,250	472	Beans	57·5	1,200	59·8
Flax	471·3	5,100	1,678	Beetroot sugar	14·4	117·5*	19
Peas	369·75	6,550	251				
				Av. area under field crops	30,764·4		32,349

* 1,000 tons.

Percentage of Mean Production of Chief Crops by Provinces

	Alberta.	*B. Col.*	*Manitoba.*	*N. B.*	*N. S.*	*Ontario.*	*P. E. Is.*	*Quebec.*	*Sask.*	*Canada.*
	%	%	%	%	%	%	%	%	%	%
Wheat	5·0	0·3	35	0·2	0·3	15·5	0·4	1·3	42	100
Barley	4·5	0·2	35·1	0·2	0·6	45·1	0·3	5·5	8·5	100
Oats	5·5	0·7	17·1	2·2	1·6	36	2·3	14·6	20	100
Rye	1·1	—	6·8	—	0·6	71·9	—	16·8	2·8	100
Maize	—	—	—	—	0·05	95·45	—	4·5	—	100
Potatoes	3·5	3·5	6·3	8·3	9·9	25·0	7·5	28·5	7·5	100
Turnips, &c.	1·5	0·4	2·7	3·0	9·5	68·7	4·0	8·4	1·8	100

Live Stock. Average No. (1907–11) in Thousands

Cattle	836	53*	413	215	333	2,716	107·7	1,490	720	6,884
Sheep and lambs	171	18	24	149·5	364	1,097	96·3	569	140	2,629
Pigs	131	14·4	153	76·5	71·5	1,745	48·2	687	316	3,243
Horses	263	36	203	59·5	67·3	728	33·2	363	432	2,385

* 1911 Returns alone available in British Columbia.

FISHERIES

PRINCIPAL ITEMS OF CATCH. VALUE IN £1,000. *Av. of 3 years*, 1908–9 to 1910–11. Salmon, 1,385. Cod, dried, 837. Lobsters, 797. Herrings, 512. Halibut, 242. Whitefish, 192. Haddock, 189. Mackerel, 184. Smelts, 147. Trout, 145.

VALUE OF CATCH IN £1,000. *Av. of 5 years*, 1906–11. Nova Scotia, 1,712. British Columbia, 1,606. New Brunswick, 977. Ontario, 405. Quebec, 395. Prince Edward Island, 263. Manitoba, Saskatchewan, Alberta, and Yukon, 262. Total Canada, 5,620.

FISH

PRINCIPAL COUNTRIES TO WHICH EXPORTED (AV. OF 3 YEARS 1909–10–11)

United Kingdom, £901,000; Brit. West Indies, £247,000; other British possessions, £169,500. Total British Empire, £1,317,500. United States, £954,000; France, £201,000; Brazil, £145,000; other foreign countries, £442,000. Total, foreign countries, £1,742,000. Total, Canada, £3,059,000.

On an average (1909–10–11), 1,623 vessels (tonnage (39,000) valued at £675,000, and 40,000 boats valued at £413,000, are employed in the Canadian fisheries, in which £3,553,000 represents the average capital invested. The number of persons employed in the fishing industry is 90,000, of whom 69,500 are fishermen.

IMMIGRATION. (EMIGRATION RETURNS ARE NOT RECORDED)

	Average of 10 years, 1902–3 *to* 1911–12.	*Highest year* (1911–12).
English and Welsh	57,950	96,800
Scots	16,750	33,000
Irish	4,700	8,300
Total British	79,400	138,100
Austro-Hungarians	12,850	21,650
Italians	6,300	7,600
Russians	4,500	9,800
Germans	2,400	4,650
Swedes	2,000	2,400
Other immigrants	21,950	36,300
Total, European and other	50,000	82,400
From the United States	70,800	133,700
Total immigrants	200,200	354,200

It is interesting to note that during the period 1902–12 the two millions of immigrants distributed themselves 28·6 per cent. to Saskatchewan and Alberta, 24·4 per cent. to Ontario, 16·2 per cent. to Manitoba, 14·5 per cent. to Quebec, 11·7 per cent. to British Columbia, 4·25 per cent. to the Maritime Provinces, while the destinations of the balance (0·35 per cent.) were not declared. Of the 665,000 immigrants entering the country in the years 1911–12, 40 per cent. were farmers, or of farm labourers' class, 25½ per cent. were general labourers, 11½ per cent. were mechanics, 5·6 per cent. female servants, 5 per cent. clerks, 2·4 per cent. miners, while the balance of 10 per cent. were not classified.

MINERAL PRODUCTION BY PROVINCES

	N. S. £1,000	*N. B.* £1,000	*Quebec.* £1,000	*Ontario.* £1,000	*Manitoba.* £1,000	*Alberta.* £1,000	*Sask.* £1,000	*Yukon.* £1,000	*B. Col.* £1,000	*Total.* £1,000
Average of 5 years, 1907–11	2,922	127·2	1,521	7,588·7	240·9	1,283·7	103·6	841	4,832·8	19,460·9
Percentage of total product	15·01	0·65	7·82	39	1·23	6·6	0·53	4·33	24·83	100

GOLD. PRODUCTION BY PROVINCES. VALUE

	B. Col. £	*Yukon.* £	*Alberta.* £	*Nova Scotia.* £	*Ontario.* £	*Quebec.* £	*Total Value.* £
1871	370,000	—	—	77,000	—	—	447,000
1881	215,000	—	—	43,000	—	12,000	270,000
1891	88,000	8,100	1,130	93,000	400	370	191,000
1901	1,093,300	3,700,000	3,100	112,400	50,400	600	4,958,000
1911	1,014,000	952,600	40	33,000	8,800	2,600	2,011,000
Increase or decrease per cent. in intercensal period 1901–11	−7·3 %	−74·3 %	−98·7 %	−70·6 %	−82·6 %	+334 %	−59·44
Average 5 years 1907–11	1,084,000	816,450	176	42,750	10,900	760	1,955,036
Percentage of total output	55·4	41·7	—	2·1	0·55	—	

SILVER. PRODUCTION AND VALUE

	British Columbia.		*Ontario.*		*Quebec.*		*Yukon.*		*Total.*	
	oz. 1,000.	*value* £1,000.	*oz.* 1,000.	*value* £1,000.	*oz.* 1,000.	*value* £1,000.	*oz.* 1,000.	*value* £1,000.	*oz.* 1,000.	*value* £1,000.
1891	3·3	0·671	225·6	45·9	185·6	27·7	—	—	414·5	74·27
1901	5,151·3	624·2	151·4	18·35	41·46	5·0	195	24	5,539·2	671·55
1911	1,887·1	206·7	30,540·7	3,345	18·435	2	112·7	12·35	32,559	3,566·0
Increase or decrease per cent. in intercensal period 1901–11	−64	−66·87	+20,072	+18,130	55·6	−60	−42·2	−48·6	+487	+431
Average of 5 years, 1907–11	2,462	364	23,022	2,552·1	13·6	1·56	68·7	7·66	25,566·3	2,925·32

PRODUCTION OF PIG-IRON

	Nova Scotia.		*Ontario.*		*Quebec.*		*Total.*	
	tons ** 1,000.	*value* £1,000.	*tons* ** 1,000.	*value* £1,000.	*tons* ** 1,000.	*value* £1,000.	*tons* ** 1,000.	*value* £1,000.
1891	21·3	63	—	—	2·5	12·2	23·9	75·3
1901	151·1	362·6	116	329·4	6·8	30·7	274·3	722·7
1911	390·2	962·3	527	1,563	0·66	3·5	917·5	2,528·8
	Increase or decrease per cent. since 1901							
	+158	+165	+354	+376	−90·3	−88·6	+234	+249
Av. of years 1906–11	353	806·6	367	1,160	5·5	27·6	725·5	1,994·2

PRODUCTION OF COAL BY PROVINCES

	N. S. *tons* * 1,000.	*B. Col.* *tons* * 1,000.	*Alb.* *tons* * 1,000.	*Sask.* *tons* * 1,000.	*Yukon.* *tons* * 1,000.	*N. B.* *tons* * 1,000.	*Total.* *tons* * 1,000.
1881	1,280	257	—	—	—	—	1,537
1891	2,268	1,130	—	—	—	5·4	3,578
1901	4,158	1,919	340	45	6	18	6,486
1911	7,004	2,542	1,511	207	2·8	56	11,323
	Increase or decrease per cent. in last intercensal period						
	+68	+32	+344	+360	−53	+211	+74
Average 1907–11	6,419	2,637	1,935	176	9	51	11,227

* Ton = 2,000 lb.

OTHER MINERALS

Lead. Average product., 1907–11, 38,713,000 lb. (£334,000).
Nickel. Average quantity in matte shipped, 1907–11, 27,597,000 lb. (£2,000,000).
Asbestos. Average product., 1907–11, 148 million lb. (£526,700).
Copper. Average product., 1907–11, 56·8 million lb. (£1,667,000).

POST OFFICE SAVINGS BANKS

	Savings Bks. *No.*	*Deposits.* £1,000.	*With-drawals.* £1,000.	*Amnt. to credit of open acc.* £1,000.	*No. of open acc. at end of year.*
1871	230	394	224·7	513·3	17,153
1891	634	1,336	1,619	4,468	111,230
1911	1,151	2,009	2,357	8,906	147,478
		Average 5 years, 1907–11.			
	—	2,121	2,557	9,180	153,180

DOMINION GOVERNMENT SAVINGS BANK (IN £1,000)

1871. Deposits, 114·4; withdrawals, 81·27; credit, 425·9.
1891. Deposits, 587·2; withdrawals, 993·3; credit, 3,629.
1911. Deposits, 480·4; withdrawals, 550·7; credit, 3,034.
Average of years 1908–12. Deposits, 476; withdrawals, 583; credit, 3,040.

INDUSTRIES. (Census 1911 for year 1910)

Principal groups of industries.	*Establishments.* No.	*Capital.* £1,000.	*Employes on wages.* No.	*Wages paid.* £1,000.	*Value of products.* £1,000.	*Increase of capital %,* 1900–10.	*Increase of products %,* 1900–10.
Food products	6,985	27,350	52,730	2,980	50,505	132·7	96·2
Textiles	1,444	22,365	72,672	5,485	27,935	79·5	100·67
Iron and steel products	824	25,398	48,558	5,300	23,360	202·39	225·8
Timber and lumber and re-manufact.	4,999	53,425	110,049	8,094	37,955	188·9	129·8
Leather and its finished products	399	10,030	22,742	1,983	12,920	127·59	81·0
Paper and printing	773	12,890	22,894	2,234	9,550	133·67	124·94
Metals and metal products other than steel	341	13,800	17,502	2,010	15,055	229·37	274·42
Vehicles for land transportation	465	10,155	35,778	4,010	14,325	208·84	249·06
Other industries	2,988	81,057	88,201	8,430	48,065	247	200
Totals	19,218	256,470	471,126	40,526	239,670	179·15	142·38

INDUSTRIES BY PROVINCES. Census 1911

	Value of products. £1,000.	*Increase % in 1900 to 1910 in value of products.*	*% total products.*		*Value of products.* £1,000.	*Increase % in 1900 to 1910 in value of products.*	*% total products.*
Alberta	3,862	1,330·64	1·6	Ontario	119,183	140·05	49·8
British Columbia	13,403	234·77	5·6	P. E. Island	645	34·8	0·3
Manitoba	11,031	315·19	4·6	Quebec	72,130	121·69	30·05
New Brunswick	7,281	68·89	3·0	Saskatchewan	1,301	871·68	0·55
Nova Scotia	10,834	123·4	4·5		239,670	142·38	100·0

THE TRADE OF CANADA

	Imports. £1,000.	*Exports.* £1,000.	*Aggregate.* £1,000.
1871	19,750	15,240	34,990
1881	21,670	20,200	41,870
1891	24,650	20,230	44,880
1901	39,126	40,374	79,500
1911	114,971	64,815	179,786

Trade Averages

Imports.				*Exports.*			
Average of 5 yrs.	£1,000.	*H.Y.*	£1,000.	*Average of 5 yrs.*	£1,000.	*H.Y.*	£1,000.
1897–1901	32,940	1901	39,126	1897–1901	34,900	1901	40,374
1902–6	52,360	1906	60,492	1902–6	45,660	1906	52,743
1907–11	86,480	1911	114,971	1907–11	59,833	1911	64,815

PRINCIPAL ITEMS OF TRADE

Principal Imports.

Average, 5 yrs., 1907–8 to 1911–12.

	£1,000.	% *of total.*
Iron, steel, and manufactures thereof	14,320	16·5
Coal	6,570	7·6
Woollen manufactures	4,549	5·2
Cotton manufactures	3,620	4·2
Wood and manufactures	2,840	3·3
Sugar (not maple)	2,690	3·1
Bullion and specie	2,416	2·8
Drugs, dyes, and chemicals	2,218	2·5
Fruits, dried and fresh	2,120	2·4
Cotton, raw	1,716	2·0
Indian corn	1,620	1·8
Hides, horns, &c.	1,450	1·6

Principal Exports.

Average, 5 yrs., 1907–8 to 1911–12.

	£1,000.	% *of total.*
Wheat	11,520	19·2
Forest produce	9,085	15·14
Cheese	4,400	7·33
Fish	3,000	5·00
Silver ore and silver	2,960	4·93
Flour	2,480	4·13
Cattle	1,786	2·97
Bacon and hams	1,776	2·96
Specie	1,440	2·40
Gold-bearing quartz	1,436	2·39
Copper and ore	1,296	2·16
Coal	1,054	1·75
Fruit	977	1·62
Hides, horns, &c.	950	1·57

It is of interest to note that in Census year 1911, Ontario received 43·9 per cent. of the total imports, Quebec 30 per cent., British Columbia 8·2 per cent., Manitoba 7·4 per cent., Nova Scotia 3·5 per cent., New Brunswick 2·4 per cent., Saskatchewan 2·3 per cent., Alberta 1·9 per cent., Yukon 0·2 per cent., and Prince Edward Island 0·1 per cent. In the same year 41·73 per cent. of the total exports left Quebec, 31·5 per cent. Ontario, 9·52 per cent. New Brunswick, 7·75 per cent. British Columbia, 6·75 per cent. Nova Scotia, 1·36 per cent. Saskatchewan, 1·05 per cent. Manitoba, 0·15 per cent. Prince Edward Island, 0·12 per cent. Alberta, and 0·07 per cent. Yukon.

TRADE WITH PRINCIPAL COUNTRIES*

Theoretically the imports of one country from another should coincide with the exports of the country from which they purport to be consigned to the importing country; in reality freight, insurance, and other charges, together with the diversion of goods exported when *en route* and variations in methods of valuation, render comparison impracticable.

AVERAGE OF 5 YEARS, 1907–8 to 1911–12

Imports from—	£1,000.	*Total* %	*Exports to*—	£1,000.	*Total* %
United Kingdom	20,040	23·9	United Kingdom	29,053	48·5
British West Indies	1,381	1·6	Newfoundland	785	1·3
British East Indies	823	0·9	Australia	703	1·2
Other British Possessions	1,484	1·8	British West Indies	669·6	1·1
			Other British possessions	1,050	1·8
Total British Empire	23,728	28·2	Total British Empire	32,260·6	53·9
Foreign countries :—			Foreign countries :—		
United States	51,630	61·5	United States	23,024	38·5
France	2,118	2·5	South America	812	1·4
Germany	1,779·6	2·1	Belgium	687	1·1
South America	682	0·8	Germany	527·4	0·9
Other foreign countries	3,991·4	4·9	France	515	0·8
			Other foreign countries	2,006·8	3·4
Total foreign countries	60,201	71·8	Total foreign countries	27,572·2	46·1
Total imports for home consumption	83,929	100	Total exports	59,832·8	100

* Imports credited to countries from which they were received directly; exports to countries to which they were exported.

STEAM RAILWAYS

Year ended June 30.	*Miles in operation.*	*No. of passengers (mill.).*	*Tons* of freight (mill.).*	*Earnings. Gross (mill. £).*	*Working expenses (mill. £).*	*Ratio of expenses and receipts.*	*Degree of activity, i.e. train mileage ÷ miles in operation.*
1881	7,260	7	12	5·7	4·1	71·89	3,761
1891	14,009	13	21·7	9·9	7·1	72·56	3,098
1901	18,140	18	37	14·9	10·3	69·06	2,941
1911	25,400	37	79·9	38·8	26·9	69·43	3,533

PER MILE OF LINE OPERATED

	No. of Passengers.	*Tons of freight.*	*Gross earnings.* £	*From freight.* £	*From Passengers.* £	*Working expenses.* £
1901	1,014	2,040	826	528·6	219·8	570·9
1911	1,460	3,145	1,527	1,023	409·2	1,060

* Ton = 2,000 lb.

RAILWAYS

Distribution of Steam Railway Mileage by Provinces, 1911

Ontario.	*Quebec.*	*Manitoba.*	*Sask.*	*Alberta.*	*B. Col.*	*N. B.*	*N. S.*	*P. E. Isl.*	*Yukon.*	*Canada.*
8,322	3,882	3,466	3,121	1,494	1,842	1,548	1,354	269	102	25,400

Miles of Railway per 1,000 Sq. Miles of Territory, 1911

31·9	11	47	12·3	5·4	5·1	55·2	63·2	123	0·49	6·8

Miles of Railway per 1,000 Inhabitants, 1911

3·2	1·9	7·6	6·3	3·9	4·6	4·4	2·7	2·8	12	3·6

The average receipts of the steam railways (1907–11) amounted to £32,900,000, the working expenditure to £23,400,000. The average number of locomotives in use was 3,928; the train miles run 78,000,000; passengers carried 34,500,000; average passenger journey 65 miles; average goods traffic amounted to 62,000,000 tons (avoir.); and average haul per ton 193 miles. The gross receipts per mile of line open averaged £1,374; gross receipts per train mile 8*s.* 0·066*d.*; working expenses per mile of line open £973; and working expenses per train mile 5*s.* 8·31*d.*

The electric railways of Canada in 1911 covered 1,224 miles (showing an increase of 121 per cent. in the last intercensal period). The passenger traffic receipts for the period 1907–11 averaged £3,000,000, the gross earnings £3,280,000, and the net earnings £1,300,000. The capital of the electric railways in 1911 amounted to £23,000,000 and that of steam railways to £380,450,000.

CANALS

Length of canal (1,594 m.), river, and lake navigation system . . . . . 2,700 miles
Cost of construction and enlargement £20,410,000

Vessels through.

	Canadian.		*American.*		*Totals.*			
Year.	*No.*	*Tonnage. 1,000 tons.**	*No.*	*Tonnage. 1,000 tons.*	*No.*	*Tonnage. 1,000 tons.*	*Passengers. No. in thousands.*	*Freight in tons.*
1891	19,246	3,135	3,602	835	22,848	3,970	146	2,902,526
1901	20,860	3,980	5,634	2,482	26,494	6,462	190	5,665,259
1911	25,585	9,172	10,370	18,232	35,955	27,404	305	38,030,353
Increase per cent. in last decensal period.								
	22	130	84	634	35	342	60	571
Average of five years, 1907–11.								
	26,200	7,805	9,700	15,319	35,900	23,124	291	30,557,600

* ton = 2,000 lb.

SHIPPING BY QUINQUENNIAL PERIODS

Total net tonnage entered and cleared in the five years.	1,000 *tons.*	*Oversea trade. Highest year.*	1,000 *tons.*	*Average tonnage of Brit. ves.* 1,000 *tons.*	*Can. ves.* 1,000 *tons.*	*For. ves.* 1,000 *tons.*	*Average tonnage of Sail. ves.* 1,000 *tons.*	*Steamers.* 1,000 *tons.*
1897–1901	13,250	1901	14,543	6,240	1,880	5,130	2,860	10,390
1902–6	15,770	1906	16,843	7,950	2,120	5,700	2,385	13,385
1907–11	21,390	1911	24,590	11,570	3,370	6,450	1,953	19,437
			Lake and River Trade					
1897–1901	12,040	1900	12,739	—	6,600	5,440	2,098	9,942
1902–6	16,600	1906	17,889	—	8,360	8,240	2.572	14,028
1907–11	23,600	1911	28,384	—	11,760	11,840	2,514	21,086

NATIONALITY OF OVERSEA SHIPPING

Average of four years, 1907–10.	1,000 *tons.*	% *of total.*	1910 1,000 *tons.*	% *of total.*
British Empire	14,429	70·08	16,054	71·98
Foreign:				
United States	3,439	16·7	3,184	14·28
Norway and Sweden	1,870·5	9·08	1,760	7·9
Japan	425·5	2·06	583	2·62
Germany	275	1·33	365	1·64
France	141·5	0·7	96	0·43
Other foreign countries	8·5	0·05	255	1·15
Total foreign countries	6,160	29·92	6,243	28·02
Total tonnage	20,589	100	22,297	100

SHIPS BUILT AND REGISTERED

During the period 1907–8—1911–12 the average number of vessels built in the Dominion was 300, and the average tonnage 31,377. The average number of vessels on the register during those five years was 7,777, of an average tonnage of 727,960.

PRINCIPAL PORTS

Av. Ton. Entered and Cleared (Ocean Trade), 1907–11

	1,000 *tons.*		1,000 *tons.*
Montreal	2,995	Quebec	2,045
Victoria	2,956	St. John	1,960
Vancouver	2,793	Sydney, N.S.	809
Halifax	2,657	Nanaimo, B.C.	650

CANADA. POPULATION. 1. Progress

	Male.	Inc. % in intercensal period.	Female.	Inc. % in intercensal period.	Total.	Inc. % in intercensal period.
1881	2,188,854	24	2,135,956	24	4,324,810	—
1891	2,460,471	12·4	2,372,768	11	4,833,239	11·76
1901	2,751,708	11·8	2,619,607	10·4	5,371,315	11·3
1911	3,821,995	38·8	3,384,648	29	7,206,643	34·16

2. Population by Provinces

Province	1911.	1901.	In. or dec.	In. (+) or dec. (−) per cent.	Pop. per sq. mile.	Males per 1,000 females.
Alberta	374,663	73,022	301,641	+413·08	1·47	1,486
British Columbia	392,480	178,657	213,823	+119·68	1·09	1,786
Manitoba	455,614	255,211	200,403	+ 78·52	6·18	1,216
New Brunswick	351,889	331,120	20,769	+ 6·27	12·61	1,045
Nova Scotia	492,338	459,574	32,764	+ 7·13	22·98	1,040
Ontario	2,523,274	2,182,947	340,327	+ 15·58	9·67	1,061
Prince Edward Is.	93,728	103,259	−9,531	− 9·23	42·91	1,000·8
Quebec	2,003,232	1,648,898	354,334	+ 21·49	5·69	1,019
Saskatchewan	492,432	91,279	401,153	+439·48	1·95	1,453
Yukon	8,512	27,219	−18,707	− 68·73	24·3*	3,247
N.W. Territories	18,481	20,129	−1,648	− 8·18	104*	1,017
Total	7,206,643	5,371,315	1,835,323	+ 34·17	1·93	1,129

* Square miles of territory to each inhabitant.

Population. Countries of Origin

	1911.	Inc. or dec. % in ten years.	No. of each origin per 100 pop.
British	3,896,985	27·22	54·08
Including :—			
English	1,823,150	44·59	25·30
Irish	1,050,384	6·24	14·58
Scotch	997,880	24·71	13·85
Welsh	24,848	89·17	0·34
French	2,054,890	24·59	28·51
German	393,320	26·67	5·46
Austro-Hungarians	129,103	610·22	1·79
Scandinavian	107,535	246·42	1·49
Indian	105,492	−17·55	1·46
Others	519,318	+ 203	7·21
Total	7,206,643	34·17	100

PRINCIPAL RELIGIONS, 1911

	1,000.	*Percent. of total pop.*	*Inc. %* 1901–11.
Roman Catholic	2,833	39·31	27·06
Presbyterian	1,115·3	15·48	32·39
Methodist	1,079·9	14·99	17·78
Anglican	1,043	14·47	53·05
Baptist	382·7	5·31	20·33
Lutheran	229·9	3·19	148·43

URBAN AND RURAL POPULATION

1. The Dominion

	1911.	*Increase on 1901 census*	*Increase %.*
Urban	3,280,964	1,259,165	62·3
Rural	3,925,679	576,163	17·2
	7,206,643	1,835,328	34·17

2. By Provinces

	1911.		*Inc. or dec. on 1901.*	
	Rural. 1,000.	*Urban.* 1,000.	*Rural.* 1,000.	*Urban.* 1,000.
Alberta	232·7	141·9	180·3	121·3
British Columbia	188·8	203·7	100·3	113·5
Manitoba	255·2	200·4	70·5	129·9
New Brunswick	252·3	99·5	−1·5	22·3
Nova Scotia	306·2	186·1	−24	56·7
Ontario	1,194·8	1,328·5	−52·2	392·5
Prince Edward Island	78·8	15	−9·5	—
Quebec	1,032·6	970·6	39·9	314·4
Saskatchewan	361·1	131·4	287·3	113·9
Yukon	4·6	3·9	−13·4	−5·3
North-West Territories	18·5	—	−1·6	—

FINANCE

	Revenue.		Expenditure.	Debt.
		Customs rev.		*Gross liabilities.*
Average.	£1,000.	£1,000.	£1,000.	£1,000.
1897–1901	9,460	5,060	8,640	70,500
1902–6	14,220	8,120	11,860	76,560
1907–11	22,060	13,280	17,500	96,220

BANKS AND BANKING

General Statement of Chartered Banks

	Capital paid up. £1,000.	*Notes in circulation.* £1,000.	*Total Liabilities.* £1,000.	*Assets.* £1,000.
1871	7,623	4,297	16,500	19,070
1891	12,470	6,795	38,500	55,370
1911	21,160	18,490	225,500	267,800
Average 1907–11	20,193	16,165	186,250	224,820

NEWFOUNDLAND AND LABRADOR

Newfoundland: area 42,734 square miles, i.e. 35 per cent. of that of United Kingdom.

Labrador: area 120,000 square miles, i.e. approximately that of United Kingdom.

AGRICULTURE

Statistics are confined to a few data collected in census years. The total area occupied in pasture in 1901 was 35,000 acres, in gardens 35,800 acres, and otherwise 144,500 acres, total 215,500 acres. The produce of the principal crops are as follows: oats, 8,500 bushels; potatoes, 1,533,000 bushels; turnips, 231,000 bushels.

LIVE STOCK

Census, 1911. Horses, 13,694 (1901, 8,851); horned cattle, 39,472 (1901, 32,767); sheep, 97,597 (1901, 78,052); pigs, 26,956 (1901, 34,679).

FISHERIES

WHALE. Average number captured, 1906–10, 480 (highest year 518, in 1909). Average products: guano, 871 tons; bone, 730 tons; oil, 478,000 gallons.

SEAL. Average number of men employed, 3,654. Seal caught, 280,000 (342,000 in 1906). Weight, nett, 6,130 tons (7,896 in 1906). Value £103,800 (£129,000 in 1910).

AVERAGE EXPORTS OF COD IN PEACE TIME *

Quintals × 1,000

1675 [1]	270	1786–90	702	1871–80	919
1676 [2]	219	1811–20	921	1881–90	1,048
1749–51 [3]	422	1841–50	970	1891–1900	1,165
1766–70 [4]	553	1851–60	1,074	1901–10	1,415
1771–4	512	1861–70	863	1911	1,183

[1] Settlers get 69,250 Q.; adventurers' ships thrice as much (Sir J. Berry).

[2] Settlers get 40,643 Q.; ships 178,800 Q. or 176,732 Q. (Captains Russell and Wyborne).

[3] After 1713 British got old French colony, but did not exploit its fisheries till 1727, or exploit them much till 1739.

[4] Labrador fisheries began 1763, and became important 1815.

AVERAGE ANNUAL VALUE OF FISH EXPORTS *

	1881–90. £1,000.	1891–1900. £1,000.	1901–5. £1,000.	1906–10 £1,000.	1911. £1,000.
Cod	954	870	1,265	1,652	1,419
Seal [1]	143	108	148	136	136
Herring [2]	39	40	71	69	80
Lobster [3]	44	89	89	76	74
Whale	2·6	1	46	40	38
Salmon [4]	16	15	17	12	11
Total fish, &c.	1,199	1,123	1,636	1,985	1,758

[1] Sealing trade began *c.* 1735 from Fogo, Twillingate, &c.; colonial sealing ships were used 1793 et seq.; steamers 1863 et seq.

[2] Herring trade began, after 1818, from the Treaty shore, &c.

[3] Lobster trade began *c.* 1880 from the Treaty shore, &c.

[4] Salmon trade began from north of Bonavista Bay (*c.* 1718), Salmonier (*c.* 1722), Fogo, &c. (*c.* 1733).

* By J. D. Rogers.

RAILWAYS

Length of line open: Government 723 miles, private 47 miles. Receipts from Government railway, 1911, £128,740 (1912, £130,180); working expenditure, 1911, £136,442 (1912, £157,645).

MINERALS

COPPER (Tilt Cove, Little Bay, and Betts' Cove were worked in 1864, 1878, and 1879 respectively)

Average domestic exports.	1,000 *tons of ore.*	*Highest year.*	1,000 *tons.*	*Average value.* £1,000.	*Highest year.*	£1,000.
1897–1901	68	1900	85·8	86·84	1900	127
1902–6	77	1902	83	85·7	1902	98·8
1907–11	46	1907	55·9	49·52 [1]	1907	57·3

[1] Two per cent. of average total exports.

IRON ORE AND PYRITES (Bell Island and Pilley Island were worked in 1896 and 1888 respectively)

1897–1901	324	1901	746	82·8	1901	159
1902–6	738	1906	913	181·4	1906	216
1907–11	1,007	1911	1,181 [1]	232*	1911	271 [1]

* Nine and a half per cent. of average total exports.
[1] Domestic Exports of 'iron ore'.

The average annual value of mineral exports from 1881–90 was copper £55,000, iron £4,000; 1891–1900, copper £85,000, iron £45,000; 1901–10, copper £70,900, iron £194,500; 1911, copper £47,600, iron £271,000.

A small quantity of gold, valued at about £11,000 per annum, is obtained from the copper ore; the average output (1896–10) was 2,500 oz., valued at £10,970.

SHIPPING

TOTAL NET TONNAGE ENTERED AND CLEARED, EXCLUSIVE OF COASTING TRADE

Average of 5 years.	1,000 *tons.*	*Highest year.*	1,000 *tons.*	*Av. Brit. ship.* 1,000 *tons.*	*Av. for. ship.* 1,000 *tons.*	*Av. tonnage Sail. ves.* 1,000 *tons.*	*St. ves.* 1,000 *tons.*
1897–1901	1,153	1900	1,447	951	202	194	959
1902–6	1,773	1906	1,864	1,086	687	222	1,551
1907–11	1,995	1911	2,252	1,113	882	196	1,799

NATIONALITY OF SHIPPING (AVERAGE OF FIVE YEARS, 1907–11)

	1,000 *tons.*	*Percent. of total.*	*H.Y.* 1911. 1,000 *tons.*	*Percent. of total.*
United Kingdom	690	34·6	840	37·3
Colonial	423	21·2	405	17·99
Total British Empire	1,113	55·8	1,245	55·29
Norwegian	777	39·9	929	41·25
Total Foreign	882	44·2	1,007	44·71
Grand total	1,995	100	2,252	100

VESSELS BUILT. The average annual output (1907–11) was 74 vessels of a net tonnage of 2,630, of which 73 (net tonnage 2,610) were sailing vessels.

VESSELS ON REGISTER. Average, 1907–11. Sailing, 3,294 (net tonnage 131,700); steam, 69 (net tonnage 14,600).

CHIEF PORTS. Average tonnage, 1907–11. St. John's, 809,000. Bell Island, 771,000. Port-aux-Basques, 107,000. Tilt Cove, 41,000. Lewisport, 26,000. Botwood, 25,000. Channel, 20,500. Placentia, 16,250.

IMPORTS AND EXPORTS (Inclu. Labrador)

	Imports (including bullion and specie).				*Exports (including bullion and specie).*			
Average of 5 years.		*Highest year.*		*Average imports from United Kingdom.*	*Average exports.*	*Highest year.*		*Average exports to United Kingdom.*
	£1,000.	£1,000.	£1,000.	£1,000.	£1,000.	£1,000.	£1,000.	£1,000.
1897–1901	1,332	1900	1,540	409	1,400	1900	1,773	325
1902–6	1,910	1906	2,140	500	2,165	1906	2,484	406
1907–11	2,447	1911	2,751	570	2,408	1907	2,487	341

PRINCIPAL ARTICLES IMPORTED AND EXPORTED

Imports.	*Average 1907–11.* £1,000.	*Percentage of total.*	Exports.	*Average 1907–11.* £1,000.	*Percentage of total.*
Flour	382	15·9	Fish :—		
Coal	133	5·5	Cod, dried	1,518·6	63
Pork, salted	97·6	4	Lobster, tinned	76	3·25
Beef, salted, &c.	92·3	3·8	Herrings, pickled	36·5	1·5
Blankets, quilts, rugs	81·6	3·4	Herrings, various	18·0	0·75
Hardware	77	3·2	Herrings, frozen	16·4	0·7
Machinery	76·1	3·1	Salmon, pickled	10·7	0·4
Oils and lard for butterine	70·6	2·9	Salmon, fresh	2·6	0·1
Molasses	62	2·5	Oil :—		
Cotton fabrics	58·6	2·4	Cod, unrefined	71·26	2·9
Leather	51·4	2·1	Seal oil	76·2	3·1
Bullion and specie	46	1·9	Whale oil	31·8	1·3
Railway material	44·6	1·8	Seal skins	61·8	2·5
Apparel	42	1·75	Lumber	37·6	1·5
Sugar	40·6	1·6			
Tea	35	1·4			
Cordage materials	33·6	1·4			
Tweeds, cloths, &c.	31·6	1·3			

Note.—Av. val. of paper exp. (1910–12) was £171,000 (1912 £247,000); of pulp £46,700 (1912 £74,250). For iron and copper exp. vide Minerals.

TRADE WITH PRINCIPAL COUNTRIES

(Vide Notes on p. 480.)

Imports.	*Average 1907–11.* £1,000.	*Total %*	*Highest year, 1911.* £1,000.	Exports.	*Average 1907–11.* £1,000.	*Total %*	*Highest year, 1907.* £1,000.
Un. King.	570	23·3	636	Un. King.	341	14·2	306·8
Canada	864·6	35·34	947	Canada	338	14	331·2
Br. W. Ind.	62·6	2·55	70·5	Br. W. Ind.	90	3·75	88·5
Other Br. Pos.	17·8	0·72	19	Other Br. Pos.	7	0·3	4·6
Total Br. Em.	1,515	61·91	1,672·5	Total Br. Em.	776	32·25	731·1
For. Countries :				For. Countries :			
Un. States	865·5	35·37	1,016	Brazil	413	17·2	424·1
Spain	19·5	0·8	18	Portugal	344	14·3	378·6
Other Foreign Countries	47	1·92	44·5	Italy	243	10	273·7
Total Foreign Countries	932	38·09	1,078·5	United States	240	10	286·6
				Spain	202	8·4	204·4
				Other For. Co	190	7·85	188·9
				Total For. Co.	1,632	67·75	1,756·3
Total imports	2,447	100	2,751	Total exports	2,408	100	2,487·4

POPULATION

	Newfoundland.	*Labrador.*	*Total.*	*Increase %.*
1884	193,124	4,211	197,335	22·3
1891	197,934	4,106	202,040	2·3
1901	217,037	3,947	220,984	9·37
1911	238,680	3,939	242,619	9·7

DENSITY OF POPULATION

Newfoundland, 5·6 inhabitants per sq. mile.
Labrador, 0·03 inhabitants per sq. mile, or 30·4 sq. miles per inhabitant.

POPULATION (IN THE NINETEENTH CENTURY AND AFTER) OF ELECTORAL DISTRICTS IN THOUSANDS[1]

	1822.	1827.	1836.	1845.	1857.	1869.	1884.	1891.	1901.	1911.
OLD BRITISH COAST										
St. John's[2] . .	13	15	19	25	30·5	29	38	36	40	46
Rest of south-east[3]	2·5	4	5	5	5	6	6·5	6	6	6
Conception Bay[4] .	19	18	23	28	33	39	47	46·5	44·5	44
Trinity Bay . .	4	5	7	9	11	14	19	19	21	22
EXTENSIONS OF OLD BRITISH COAST										
Bonavista Bay .	4	5	5	7	9	11	16·5	18	20·5	23
Fogo and Twillingate[5] . .	3	3·5	5	7	10	13	20·3	23·5	27	31
OLD FRENCH COAST[6]	6·5	8	11	16	17	22	27	29·5	34	37·6
ENGLISH EXTENSIONS OF OLD FRENCH COAST[7].	Nil	2	2	2	3·5	5	6·6	6·5	7	7·7
TREATY SHORE[8]	Almost Nil				3	5	12	13	17	22
LABRADOR[9] . .	Do.				1·6	2·5	4·2	4	4	4
Total . .	52	60	77	99	124	147	197	202	221	243

[1] By J. D. Rogers. [2] Split into two. [3] Ferryland and Trepassey. [4] Harbor Grace, Bay-de-Verde, Carbonear, Harbour Maine, Port de Grave. [5] Split into two in 1885. [6] Placentia, Burin, and Fortune Bay. [7] Burgeo and La Poile. [8] St. George's Bay and St. Barbe. [9] Not an electoral district.

GROWTH OF POPULATION, 1901–11, BY DISTRICTS

	1911.	*Inc. + or Dec. − %* 1901–11.
Bay-de-Verde . .	10,213	+ 3·8
Bonavista . .	22,894	+ 11·3
Burgeo and La Poile .	7,793	+ 11·1
Burin . . .	11,616	+ 11·7
Carbonear. . .	5,114	+ 1·7
Ferryland . .	5,793	+ 1·8
Fogo . . .	8,257	+ 9
Fortune Bay . .	9,989	+ 14
Harbor Grace . .	11,925	− 5·9
Placentia & St. Mary's	16,099	+ 5·9
Port-de-Grave . .	6,986	− 6·1
St. Barbe . . .	10,481	+ 28·8
St. George's . .	11,861	+ 30·3
Harbour Main . .	9,471	− 0·3
St. John's East . .	25,135	+ 16·9
St. John's West .	20,550	+ 11·3
Trinity . . .	21,788	+ 5·2
Twillingate . .	22,705	+ 16·7
Tot. for Newf'ndland	238,680	+ 9·9
Labrador .	3,939	+ 0·2
	242,619	

SEX

Newfoundland.	*Males.*	*Females.*	*No. of males per 1,000 females.*
1891	100,775	97,159	1,037
1901	111,311	105,726	1,052
1911	122,253	116,417	1,050

Labrador. In 1911 there were 2,052 males and 1,897 females; that is to say, 1,081 males to each 1,000 females.

IMMIGRATION AND EMIGRATION

For the four years 1903–6, the average number of immigrants, 12,430, exceeded the average number of emigrants, 11,305, by 1,125, but for the period 1907–11 the emigrants, averaging 10,566 per annum, exceeded the immigrants, 9,032, by 1,534 per annum, a result largely brought about by the total of immigrants in 1909 falling to 793. (1912, immigrants, 11,912, emigrants, 9,179.)

VITAL STATISTICS

During the period 1906–10 the birth rate per 1,000 of the estimated mean population averaged 29·47 (1910, 29·79), the marriage rate 7·54 (1910, 7·57), and the death rate 17·16 (1910, 15·20).

RELIGIOUS CENSUS, 1911

		% of total pop.	*Inc. % since 1901.*
Roman Catholic	81,177	33·4	7·7
Church of England	78,616	32·4	7
Methodist	68,044	28	10·9
Salvation Army	10,139	4·2	53·5
Presbyterian	1,876	0·8	25·3
Congregationalist	1,012	0·4	6·5
Other denominations	1,755	0·8	13·6
	242,619	100	

REVENUE AND EXPENDITURE

	Revenue.		Expenditure.			Public Debt.	
Av. of 5 years.	£1,000.	*H.Y.*	£1,000.	£1,000.	*H.Y.*	£1,000.	£1,000.
1897–1901	373	1900	434	388	1901	416	3,488
1902–6	504	1906	547	486	1906	533	4,274
1907–11	631	1911	725	610	1911	689	4,847[1]

[1] Public Debt in 1911, £5,586,000.

The chief item of revenue is furnished by the customs, that in the period 1907–11 averaged £530,000, and in 1911 amounted to £596,000. The Post and Telegraph Department, averaging £32,000 (£40,500 in 1911), and Crown Lands, averaging £28,000 (1911, £39,450), are next in order of importance. The chief items of expenditure comprise interest on Public Debt, Sinking Fund, &c., £210,000, the Post and Telegraph Department £115,000, Education £75,000, and Public Charities £66,000.

SAVINGS BANK (GOVERNMENT)

Average of 5 years.	*Number of Depositors.*	*Amount Deposited.* £1,000.	*Withdrawn.* £1,000.	*Standing to credit of depositors at end of year (including interest)* £1,000.
1897–1901	3,640	72·0	74·8	252
1902–6	5,393	108·9	69·5	370
1907–11	7,457	140·6	106·6	555

AREA AND POPULATION

	Area.	Population. 1881.	1891	1901	1911.	Inc. or dec. % in period 1901–11.	Males per 1,000 females.	Pop. per sq. m.
	sq. m.	1,000.	1,000.	1,000.				
Bahamas	4,404	43·5	47·6	53·7	55,944	+ 3·9	806	12·7
Turks and Caicos Is.	166	4·7	4·7	5·3	5,615	+ 6·2	805	33·8
Jamaica	4,207	581	639	756	831,383	+10	915	197·6
Cayman Is.	89	—	4·3	·5	5·5	+11·3	773	62·5
St. Lucia	233	38·5	42·2	49·9	48,637	— 2·5	850	208·7
St. Vincent	140	40·5	41	47·5	41,877	—11·94	779	299·1
Barbados	166	172	183	195	171,982	—12·1	690	1,036
Grenada, &c.	133	42·4	53·2	64·4	66,750	+ 5·2	836·2	501·9
Leeward Islands :								
Antigua	108	34·9	36·12	34·18	32,265	— 7·68	765	189·8
Barbuda	62		·58	·77				
St. Kitts	65	29·1	30·87	29·78	26,283	—11·8	716	404·4
Nevis	50	11·8	13·08	12·77	12,945	+ 1·4	744	258·9
Anguilla	35	3·2	3·70	3·89	4,075	+ 4·7	621	116·4
Montserrat	32	10	11·76	12·21	12,316	— 0·15	771	379
Redonda	½		·12	·12				
Dominica	305	28·2	26·84	28·89	33,863	+17·1	817	111
Virgin Islands	58	5·3	4·64	4·91	5,557	+13·2	884	95·8
Total Leeward Is.	715½	122·5	127·71	127·52	127,184	— ·27	765	177·8
Trinidad	1,754	153	200	255·1	333,552	+21·7	1,095	179·2
Tobago	114	18	18·3	18·75				
Bermuda	19	13·9	15	17·5	18,994	+ 8·3	914	999·7
British Honduras	8,598	27·4	31·5	37·5	40,458	+ 7·9	1,015	4·7
British Guiana	90,500	252	270	294	296,041	+ 0·7	1,080	3·3
Falkland Is., &c.	6,500	1·5	1·8	2	2,272	+11·3	2,620	0·4
South Georgia	1,000	—	—	—	1,003	—		

AGRICULTURE

Jamaica.—Av. area cultivated, 1909–11, 888,400 acres. Av. area under : Guinea grass and pasture, 631,000 ac. ; ground provisions, 97,500 ac. Bananas, 69,400 ac. (av. exp. 15,770,000 bunches). Sugar-cane, 30,000 ac. (av. exp. 333,000 cwt.). Coffee, 25,000 ac. (av. exp. 73,300 cwt.). Coco-nuts, 14,000 ac. (av. exp. 17·3 mill.). Cacao, 10,500 ac. (av. exp. 49,000 cwt.). Av. no. of oranges exp., 41 mill. Tobacco : av. area, 816 ac., product (1911) 494,600 lb.

St. Lucia.—Area under cacao, 6,000 ac. Exports, av., 1907–11, 1,791,000 lb. Sugar, 3,000 ac., av. exp. 102,400 cwt.

St. Vincent.—Area under cotton, approx., 3,600 ac., av. exp. ('07–11), 452,000 lb. Cacao, 1,000 ac., av. exp. ('07–11), 242,000 lb. Sugar, av. exp., ('07–11), 5,800 cwt.

Barbados.—Area cultivated, 74,000 ac. Sugar, av. '07–11, 34,000 ac. Av. prod., 639,000 cwt. Av. exp. 633,000 cwt. Cotton (av. '07–11), 5,300 ac. Av. prod., 800,000 lb. Av. value of exp., £53,000.

Grenada.—Av. cotton exp. (1907–11), 277,400 lb. (£7,700). Av. cacao exp. (1907–11), 11,898,000 lb.

Leeward Is.—Cacao, av. exp. (1907–11), 1,203,000 lb. Sugar, Virgin Is., 200 ac. St. Kitts, Nevis, av. 1907–11, 15,700 ac. ; av. prod., 259,800 cwt. Montserrat, av. area, 550 ac. ; av. prod., 3,560 cwt. Antigua, av. area, 15,870 ac. ; av. prod., 256,730 cwt. Dominica, 550 ac. Cotton, av. area, 7,100 ac. ; av. prod., 1,015,000 lb. ; av. value of exp., £67,300.

Tobago and Trinidad.—Area under cacao (av. '07–11), 266,000 ac. ; av. exp., 52,658,000 lb. Sugar-cane (av. '07–11), 61,000 ac. ; av. prod., 1,023,000 cwt. Coco-nuts (av. '08–10), 17,900 ac. ; av. value of exp., £67,000. Rice (av. '08–10), 10,300 ac. Coffee, 4,000 ac.

Bermuda.—Census 1911 : area under tillage 2,761 ac. ; wood or natural pasture, 5,729 ac. ; cult. grasses 68 ac. ; marsh 177 ac. Prin. crops (year ending 31/3/1911) : potatoes, 35,000 brls. ; onions, 142,900 crates ; sweet potatoes, 8,777,000 lb. Arrowroot, 26,190,000 lb. ; celery, 45,760 boxes ; parsley, 39,660 boxes ; lily bulbs (large), 1·07 mill., (small) 3·6 mill.

Brit. Honduras.—Cacao, av. exp., '07–11, 34,000 lb. ; coffee, 10 ac. (25,000 trees) ; sugar, av. area, 935 ac., av. prod., 12,000 cwt. ; rubber, av. exp. '07–11, 20,400 lb. (£3,360).

Brit. Guiana.—Cacao, av. 1907–11, 2,127 ac., av. exp. 73,000 lb. ; coffee, av. '07–11, 1,823 ac., av. exp. 86,000 lb. ; sugar, av. '07–11, 73,000 ac., av. exp. 2,099,200 lb. ; rubber, av. '07–11, production, 1,080,000 lb., av. value £122,000 ; coco-nuts, av. area '09–11, 9,180 ac. ; rice, av. area, 35,300 ac.

SHIPPING

TOTAL NET TONNAGE OF VESSELS ENTERED AND CLEARED (EXCLUSIVE OF COASTING TRADE)

		Total net tonnage.			*Av. tonnage of British vessels.*	
	Av. of years.	1,000 *tons.*	*Highest year.*	1,000 *tons.*	1,000 *tons.*	% *of total.*
BAHAMAS :	1897–1901	873	1900	1,114	368	42·1
	1902–6	1,244	1906	1,724	240	19·2
	1907–11	1,606	1907	1,929	175	10·8
TURKS AND CAICOS ISLANDS :	1897–1901	281	1897	328	74·76	26·6
	1902–6	330	1906	358	81·12	24·5
	1907–11	383	1909	433	100·4	26·2
JAMAICA :	1897–1901	1,783	1901	1,992	1,061	59·5
	1902–6	2,527	1906	3,026	1,003	39·6
	1907–11	3,459	1911	4,319	1,393	40·2
ST. LUCIA :	1897–1901	1,664	1901	1,864	1,406	84·4
	1902–6	1,646	1906	2,135	1,400	85
	1907–11	2,846	1911	3,996	2,444	85·8
ST. VINCENT :	1897–1901	280	1901	361	271	96·7
	1902–6	398	1904	498	394	99
	1907–11	312	1908	340	294	94·2
BARBADOS :	1897–1901	1,351	1901	1,476	1,246	92·2
	1902–6	1,592	1906	1,763	1,462	91·8
	1907–11	2,623	1911	3,475	2,088	79·6
GRENADA :	1897–1901	465	1901	543	443	95·2
	1902–6	602	1905	639	592	98·3
	1907–11	558	1910	590	547	96·2
CAYMAN IS.	1911–12	40	1912	45	30·6	76·5
LEEWARD ISLANDS * :	1897–1901	1,654	1901	1,796	1,590	96·1
	1902–6	2,017	1905	2,172	1,936	95·9
	1907–11	2,314	1908	2,507	2,131	92·9
TOBAGO AND TRINIDAD :	1897–1901	1,254	1897	1,341	726	57·89
	1902–6	1,857	1904	2,018	1,247	67·14
	1907–11	2,524	1911	3.658	1,579	62·5
BERMUDA :	1897–1901	610	1901	934	496	81·3
	1902–6	636	1902	716	552	86·7
	1907–11	1,043	1911	1,403	867	83·1
BRITISH HONDURAS :	1897–1901	378	1901	415	157	41·54
	1902–6	475	1904	503	292	61·48
	1907–11	658	1910	979	329	50
BRITISH GUIANA :	1897–1901	672	1901	726	436	64·86
	1902–6	784	1904	866	553	70·53
	1907–11	928	1910	1,066	618	66·61
FALKLAND ISLANDS :	1897–1901	147·4	1901	194	69	46·8
	1902–6	237·4	1906	278	227·6	95·9
	1907–11	317·4	1911	350·7	286	90·1

* Including Inter-Presidency Shipping.

Principal Ports (1908–10).—JAMAICA, Kingston, average tonnage 1,934,000 (58·32 % of total net tonnage); Port Antonio, 852,000 (25·68 %). LEEWARD ISLANDS: Roseau (Dominica), 710,000 tons (29·71 %); St. John's (Antigua), 671,000 tons (28·07 %); Basseterre (St. Kitts), 544,000 tons (22·76 %). TRINIDAD, Port of Spain, 2,305,000 tons (96·56 %). BERMUDA: Hamilton, 790,000 tons (79·47 %); St. George, 204,000 tons (20·52 %). BRITISH HONDURAS: Belize, 724,000 tons (99·45 %). BRITISH GUIANA: Georgetown (Demerara), 939,000 tons (98·4 %).

LIVE STOCK

	Horses.	*Horned Cattle.*	*Sheep.*	*Pigs.*
Bahamas (av. 1909–11)	1,091	1,578	10,900	—
Turks and Caicos (av. 1907–11)	97	634	145	—
Jamaica (av. 1908–10)	52,500	108,000	13,000	31,000
Barbados (av. 1907–11)	2,466	—	—	—
Grenada (census 1911)	1,493	5,101	—	—
Tobago and Trinidad (av. 1908–11)	4,445	12,500	2,300	9,000
British Guiana (av. 1908–10)	1,886	73,200	17,600	14,200
Falkland Isl. (av. 1907–11)	3,299	5,700	706,400	78

MINERALS

Bahamas.—Salt, av. product, 1906–10, 1,251 tons. Val. £380.

Turks and Caicos Is.—Salt, av. exp., 1907–11, 39,600 tons. Val. £16,200.

Barbados.—'Manjak' (pitch), av. exp., 1907–11, 360 tons. Val. £3,320.

Trinidad and Tobago.—Asphalt, av. product, 1906–10, 140,000 tons. Val. £113,000. Limestone, av. value, £6,900. 'Manjak,' av. value, £3,760. In the year 1910–11 4·4 mill. gals. of petroleum were produced.

British Guiana.—Gold, av. 1907–11, product. 62,191 oz. Av. val. £226,000. Diamonds, av. exp. 1907–11, 4,800 carats. Val. £7,760.

RAILWAYS

Jamaica.—Length of line open, 185 m.; av. receipts, 1897–1901, £112,000; 1902–6, £133,000; 1907–11, £162,000; highest year, 1911, £190,000; av. working expend., 1897–1901, £87,000; 1902–6, £84,000; 1907–11, £103,000, i. e. 63 % of receipts; highest year, 1909, £110,600.

Barbados.—Length, 28 m.; av. receipts (1907–11), exclu. of Govt. subs. of £2,000, £6,600; av. working expend., £8,470.

Antigua.—Two private lines, narrow gauge, 16 and 3½ m. in length respectively.

Trinidad.—Length, 81 m.; cost of construction per m. £11,485; av. receipts, 1907–11, including railway and telegraph rec., £105,600; working expend., £64,400 or 61 % of receipts.

British Honduras.—Length, 25 m.; av. receipts since opening, 1908, £2,829 (1911–12, £3,116); working expenses, £5,972 (1911–12, £6,693).

British Guiana.—Length, 95 m.; av. receipts (1907–11), exclu. particulars of a private line 19 m. in length, £51,000; working expend. £34,000, i. e. 66 % of receipts.

IMPORTS AND EXPORTS

Average of Periods: (1) 1897–1901; (2) 1902–6; (3) 1907–11

	Imports.					Exports.				
Period.	*Total.* £1,000.	*Highest Year.*	£1,000.	*Av. Imports. From the U. K.* £1,000.	*% of total.*	*Total.* £1,000.	*Highest Year.*	£1,000.	*Av. Exports. To the U. K.* £1,000.	*% of total.*
Bahamas:										
1	283	'00	335	62·7	22·1	175	'00	207	21·8	12·4
2	307	'06	329	65·7	21	212	'05	223	16	7·5
3	345	'07	373	88·6	25·6	199	'07	238	26·9	13·5
Turks and Caicos Islands:										
1	29·3	'97	33·2	3·2	10·9	35·3	'97	43·3	·22	·6
2	28·6	'02	32·3	4	14	27·6	'02	32·5	1·10	3·9
3	25·96	'10	27·9	4·84	18·6	23·1	'08	24·8	·29	1·2
Jamaica:										
1	1,759·6	'99	1,844	828	47	1,741	'01	1,939	351	20·1
2	1,985·6	'06	2,261	968	48·7	1,821	'02	2,292	355	19·4
3	2,675	'07	2,914	1,183	44·2	2,558	'11	2,948	504	19·7

Period.	Imports. Total. £1,000.	Highest Year.	£1,000.	Av. Im. from the U.K. £1,000.	% of total.	Exports. Total. £1,000.	Highest Year.	£1,000.	Av. Ex. to the U.K. £1,000.	% of total.
St. Lucia (*including imports of bunker coal, Exports exclude value of bunker coal exported*):										
1	317·4	'00	403	166·6	52·4	105·8	'97	154	25	23·6
2	303·2	'04	370	168	55·4	100·8	'06	114·6	51·4	51
3	292·4	'11	318	84	28·7	129·4	'08	150·4	71·4	55·1
St. Vincent:										
1	87·4	'99	103·7	30·4	35·9	60	'00	100	30·6	51
2	75·6	'02	79·1	27·4	36·2	54	'06	83·7	25·4	47
3	99·7	'08	113·7	39·7	39·8	98·7	'11	114·7	58	58·75
Barbados (*Exports exclude bunker coal*):										
1	1,022·5	'98	1,059	447	43·7	844	'01	950	51	6·0
2	999·7	'06	1,192	430	43	763	'05	936	114	14·9
3	1,300·3	'11	1,539·7	545	41·9	896	'10	1,004	124	13·8
Grenada:										
1	214	'06	246	99	46·2	259	'00	312	218	84·1
2	235	'04	252	104	44·2	282	'02	310	196	69·5
3	285	'11	308	132	46·3	323	'07	417	193	59·73
Leeward Islands (*including Inter-Presidency Trade*):										
1	350	'01	376	143	40·8	327	'99	373	59	18
2	408	'06	424	173	42·4	367	'05	423	98	26·7
3	570	'11	713	241	42·2	526	'11	566	186	35·3
Trinidad and Tobago (*including transhipments*): *Imports for consumption*:										
1	2,431	'01	2,652	888	36·53	2,387	'00	2,584	803	33·59
2	2,850	'05	3,304	949	33·31	2,653	'05	3,168	715	26·96
3	3,542	'11	5,019 [1]	1,073	30·27	3,572	'11	4,769 [1]	757	21·19

In connexion with the above statistics it should be noted that 'transhipments' averaged £493,000 (1897–1901), £488,000 (1902–6), and £1,000,000 (1907–11).

Bermuda:										
1	398	'01	526	164 [2]	41	113	'97	127·7	3·5	3
2	547	'04	632	273 [2]	50	145	'06	161·4	10	6·8
3	463	'11	545	130	28	134	'09	184	3·1	2·3
British Honduras:										
1	252	'97	292	81	32·1	274	'97	289	154	56·1
2	363	'06	452	96	26·4	367	'06	415	91 [3]	24·79
3	555	'11	593	129	23·24	479	'11	552	80	16·7
British Guiana:										
1 [4]	1,315	'98	1,371	725	55·13	1,837	'00	1,982	886	48·22
2	1,533	'06	1,634	833	54·34	1,829	'04	1,932	773	42·27
3	1,707	'08	1,778	886	51·89	1,883	'11	2,084	771	40·95
Falkland Islands:										
1	70·4	'01	74·8	63	89·48	118·6	'99	139	115·4	97·27
2	69·8	'03	111·4	54	77·36	146	'06	185	145·4	99·59
3	87	'09	98·9	78	89·66	286·6	'11	471 [5]	211·4	73·75

Cayman Is. Av. 1908–12 Imp. £24,700 (1912, £28,400), Exp. £11,600 (1912, £12,300).

[1] Transhipments this year £2,263,500.

[2] Includes government stores, 1901–2–3.

[3] Between 1900 and 1902 the exports to the United States were more than doubled, with a consequent falling away in exports to the United Kingdom.

[4] Includes transhipments in years prior to 1900–1.

[5] A note to the official statistics states that this sum is exclusive of exports from South Georgia, valued at £426,438.

TRADE WITH PRINCIPAL COUNTRIES (see note on p. 480)

AVERAGE IMPORTS AND EXPORTS IN £1,000, PERCENTAGE OF TOTAL, HIGHEST YEAR IN £1,000

(Imports are credited to the countries from which they were received directly; exports to the 'Countries to which they were exported', unless otherwise stated.)

	U.K.	*Canada.*	*B.W.Ind.*	*Total British Empire.*	*U.S.A.*	*France.*	*Germany.*	*Total Foreign Countries.*	*Grand Total.*
Bahamas: av. 1908–10.									
Av. imp. from	89	10	—	105	234	—	—	242	347
% of total	25·65	2·88	—	30·26	67·44	—	—	69·74	100
Av. exp. to	25	—	—	27	110	—	17	156	183
% of total	13·65	—	—	14·75	60·10	—	9·28	85·25	100
Turks and Caicos Is.: av. 1908–10.									
Av. imp. from	5·1	3·7	—	10·8	13·3	—	—	15·1	25·9
% of total.	19·69	14·29	—	41·7	51·36	—	—	58·3	100
Av. exp. to	0·45	2·3	—	3·76	17·2	—	—	18·94	22·7
% of total	1·98	10·14	—	16·56	75·77	—	—	83·44	100
Jamaica: av. 1907–11.									
Imp. 'Countries whence assigned.'									
Av. imp. from	1,183	192·6	—	1,409	1,189	—	53	1,266	2,675
% of total	44·2	7·2	—	52·6	44·4	—	2	47·4	100
H. Y. 1907	1,382	162	—	1,580	1,268	—	46	1,334	2,914
Av. exp. to	504	164	42	726	1,509	126	65	1,832	2,558
% of total	19·7	6·4	1·64	28·4	58·98	4·92	2·54	71·6	100
H. Y. 1911	434	253	37	753	1,826	112	89	2,195	2,948
St. Lucia: av. 1909–11.									
Av. imp. from	72·3	—	—	103	162·3	—	—	184	287
% of total	25·2	—	—	35·9	56·5	—	—	64·1	100
Av. exp. to	77·5	—	—	96	—	26·3	—	30	126
% of total	61·5	—	—	76·2	—	20·9	—	23·8	100
St. Vincent: av. 1908–9–1910–11.									
Av. imp. from	39·9	—	—	75·6	17·3	—	—	21·3	96·9
% of total	41·18	—	—	78·02	17·85	—	—	21·98	100
Av. exp. to	61·2	—	—	100·5	—	—	—	2·3	102·8
% of total	59·55	—	—	97·78	—	—	—	2·22	100

Barbados: av. 1907–11.

Imp. classified accord. to 'Countries of origin' in 1911, 'Countries whence imported' previous years.
Exp. class. 'Countries of ultimate destination' in 1911, 'Countries to which exported' previous years.

Av. imp. from	545·6	145·1	59·5	827·1	611·3	—	—	473·2	1,300·3
% of total	41·96	11·16	4·58	63·62	31·64	—	—	36·38	100
H. Y. 1911	599·4	188·3	76	997·2	428	—	—	542·5	1,539·7
Av. exp. to	124	363	145	717	107	—	—	180	973 *
% of total	12·75	37·31	14·9	73·69	11	—	—	18·49	100 *
H. Y. 1910	129·2	484·8	143·5	837·8	94·8	—	—	166·4	1,088·8 *

Grenada: av. 1908–10.

Av. imp. from	132	17	—	201	76	—	—	83	284
% of total	46·48	5·98	—	70·78	27·38	—	—	29·22	100
Av. exp. to	207	—	—	213·8	35	62	—	98·2	312
% of total	66·34	—	—	68·53	11·21	19·87	—	31·47	100

Leeward Is.: av. 1908–10.

Av. imp. from	213	44 †	—	327·5	194	—	—	212·5	540
% of total	39·45	8·15	—	60·65	35·92	—	—	39·35	100
Av. exp. to	165	228 †	—	430	58	—	—	82	512
% of total	32·22	44·52	—	83·99	11·33	—	—	16·01	100

Tobago and Trinidad: av. 1907–11.

Imp. class. accord. to 'Countries whence imported.'

Av. imp. from	1,073·4	135†	57	1,483	868	84	86	2,059	3,542
% of total	30·27	3·81	1·61	41·86	24·51	2·37	2·43	58·14	100
H. Y. 1911	1,419	190†	147	2,235	1,034	96	149	2,784	5,019
Av. exp. to	757	291†	59	1,170	1,051	604	229	2,402	3,572
% of total	21·19	8·15	1·65	32·75	29·41	16·91	6·41	67·25	100
H. Y. 1911	1,129	244†	168	1,783	1,271	349	502	2,986	4,769

Bermuda: av. 1906–10.

Av. imp. from	122·6	74	—	203	228·4	—	—	230·7	433·7
% of total	28·21	17·02	—	46·91	52·55	—	—	53·09	100
H. Y. 1910	158	83·4	—	249	267	—	—	268	517
Av. exp. to	8·8	2·56	—	13·8	125	—	—	125·7	139·5
% of total	6·31	1·84	—	9·9	89·6	—	—	90·1	100
H. Y. 1909	3·4	2·9	—	8·4	175·4	—	—	175·4	183·8

* Includes bunker coal not allocated. † British North America.

TRADE WITH PRINCIPAL COUNTRIES (*continued*)

AVERAGE IMPORTS AND EXPORTS IN £1,000, PERCENTAGE OF TOTAL, HIGHEST YEAR IN £1,000.

	U.K.	*Canada.*	*B.W.Ind.*	*Total British Empire.*	*U.S.A.*	*France.*	*Germany.*	*Total Foreign Countries.*	*Grand Total.*
British Honduras: av. 1907–11.									
Imp. class. accord. to 'Countries whence consigned' from June 1909, previous years 'Countries whence imported.'									
Av. imp. from	129	—	—	132	254	—	—	423	555
% of total	23·24	—	—	23·78	45·76	—	—	66·22	100
H. Y. 1911	127·6	—	—	132·7	262·7	—	—	460·7	593·4
Av. exp. to	80	—	—	81	306	—	—	398	479
% of total	16·7	—	—	16·91	63·89	—	—	83·09	100
H. Y. 1911	68·96	—	—	68·96	394·87	—	—	483·13	552·09
British Guiana: av. 1907–11.									
Imp. class. accord. to 'Countries of origin' from Oct. 1908, previously 'Countries whence imported.'									
Av. imp. from	886	132	29	1,102	476	22	—	605	1,707
% of total	51·89	7·73	1·67	64·55	27·89	1·29	—	35·45	100
H. Y. 1908	977	126	42	1,173	524	15	—	605	1,778
Av. exp. to	771	748	70	1,592	216	—	—	291	1,883
% of total	40·95	39·72	3·71	84·54	11·48	—	—	15·46	100
H. Y. 1911	713	875	59	1,649	362	—	—	434	2,083
Falkland Islands: av. 1907–11.									
Av. imp. from	78	—	—	78	—	—	—	9·1	87·1
% of total	89·66	—	—	89·66	—	—	—	10·34	100
Av. exp. to	211·4	—	—	211·4	—	—	—	75·2	286·6
% of total	73·75	—	—	73·75	—	—	—	26·25	100

PRINCIPAL ARTICLES IMPORTED AND EXPORTED

Bahamas (av. 1908–10). Imports: cotton, woollen, linen, and silk goods, £53,000 (15·28 % of total imp.); flour, £46,000 (13·26 %); earthenware and glass, £35,000 (10·09 %). Exports: sponge, £98,000 (53·55 %); Bahamas hemp, £44,000 (24·04 %).

Turks and Caicos Is. (av. 1908–10). Imports: flour, £2,400 (9·26 % of total imp.); cotton goods, £2,900 (11·19 %). Exports: salt, £16,900 (74·46 %); sisal grass, £3,200 (14·09 %).

Jamaica (av. 1906–11).

Imports.	£1,000.	% of total.	H.Y. 1907–8. £1,000.	Exports.	£1,000.	% of total.	H.Y. 1911. £1,000.
1. Cotton Manuf.	359	13·7	411·2	1. Bananas	1,161	47·15	1,456·6
2. Flour, wheat.	236	9	248·4	2. Spirits; rum	158·5	6·43	85·9
3. Fish	185·6	7·1	172·6	3. Sugar	155·6	6·32	247·4
4. Wood and timber	125·8	4·7	144·7	4. Coffee	132	5·36	154·1
5. Grain: rice and maize	104	3·9	118	5. Logwood Extract.	125	5·07	166
6. Boots and Shoes	81·3	3·1	94·2	6. Cacao	104·5	4·24	101·4
7. Apparel	80·5	3	109·8	7. Specie: gold	97	3·94	111·7
8. Machinery	70·3	2·6	83·5	8. Pimento	69·6	2·82	83·2
				9. Logwood.	68	2·76	99·1
				10. Coco-nuts	63·5	2·57	98·7
				11. Oranges	53	2·15	47

Tobago and Trinidad (av. 1907–11. H. Y. 1911).

1. Apparel	486	13·72	599	1. Cacao	1,514	42·38	1,393
2. Hardware & machinery	265	7·48	413	2. Sugar	576	16·13	570
3. Balata gum	248	7	476	3. Balata gum	248	6·94	477
4. Flour	224	6·32	232	4. Asphalt	170	4·76	195
5. Cacao	220	6·21	239	5. Apparel	118	3·30	224
6. Rice	127	3·58	150	6. Hides and skins	117	3·27	178
7. Hides and skins	107	3·02	169	7. Bullion: gold	106	2·97	285
8. Bullion: gold	104	2·93	282				
9. Meat of all kinds	95	2·68	81				

St. Lucia (av. 1908–10). Imports: coal, £106,000 (38·14 %); cotton manuf., £25,000 (9 %); flour, £21,000 (6 %); fish, preserved, £9,300 (3·3 %). Exports: sugar, £60,000 (44·13 %); cacao, £42,000 (31·53 %).

St. Vincent (av. 1908–10). Imports: textiles, £23,000 (23·5 %); flour, £10,300 (10·53 %). Exports: arrowroot, £30,000 (31·58 %); raw cotton, £29,660 (31·23 %).

Barbados (av. 1907–11). Imports: textiles, £207,000 (15·9 %); flour, £85,000 (6·5 %); lumber, &c., £80,200 (6·2 %); manures, £80,000 (6·1 %); coal, coke, £77,000 (5·9 %); rice, £68,600 (5·2 %); meat, £56,000 (4·3 %); fish, £51,600 (4 %). Exports: molasses, £291,000 (29·9 %); sugar, £278,200 (28·5 %); coal, 77,200 (7·9 %); raw cotton, £53,000 (5·4 %).

Grenada (av. 1908–10). Imports: flour, £35,000 (12·32 %); cotton manuf., £24,000 (8·45 %); apparel, £14,000 (4·9 %); other textiles, £22,000 (7·75 %); fish, £14,000 (4·9 %); wood and timber, £14,000 (4·9 %). Exports: cacao, £273,000 (87·5 %); spices, £19,000 (6·09 %).

Leeward Islands (av. 1908–10). Imports: cotton, linen, &c., manuf., £65,000 (12·06 %); flour, £64,000 (11·85 %); haberdashery, £35,000 (6·48 %); hardware and cutlery, £26,000 (4·8 %); fish, £25,000 (4·63 %). Exports: sugar, £241,000 (47·07 %); limes and lime-juice, £55,000 (10·74 %); raw cotton, £53,000 (10·35 %); molasses, £31,000 (6·05 %).

Bermuda (av. 1906–10). Imports: provisions, £30,800 (7 %); flour and meal, £21,800 (5 %); cotton goods, £21,200 (4·8 %); apparel, £20,300 (4·6 %); live stock, £19,800 (4·5 %); butter, £16,200 (3·7 %). Exports: onions, £42,600 (30·6 %); specie, £31,400 (22·6 %); potatoes, £29,100 (20·9 %); other vegetables, £10,800 (7·7 %); lily bulbs, £7,100 (5·1 %).

British Honduras (av. 1907–11). Imports: wood and timber, £68,000 (12·23 %); sapodilla gum, £65,000 (11·69 %); cotton goods, £56,000 (10·07 %). Exports: sapodilla gum, £151,000 (30·89 %); mahogany, £145,000 (29·66 %); bananas, £23,000 (4·7 %); coco-nuts, £21,000 (4·3 %); logwood, £19,000 (3·88 %).

British Guiana (av. 1907–11). Imports: cotton manuf., £192,000 (11·26 %); flour, £191,000 (11·19 %); manures, £152,000 (8·9 %); machinery, £76,000 (4·45 %); haberdashery, £57,000 (3·34 %). Exports: sugar, £1,177,000 (62·5 %); bullion and specie, £274,000 (14·55 %); rum, £124,000 (6·58 %); Balata gum, £113,000 (6 %).

Falkland Is. (av. 1908–10). Imports: groceries, £19,600 (22·1 %); hardware, £11,800 (13·3 %). Exports: wool, £137,000 (57·55 %); whale oil, £74,000 (31·09 %).

FINANCE

	Revenue.					Expenditure.		
Average of five years.	*Total Revenue.* £1,000.	*H.Y.*	£1,000.	*Average Customs* £1,000.	*% of total.*	*Total Expenditure.* £1,000.	*H.Y.*	£1,000
Bahamas: Public Debt (1907–11), £99,000 (1912, £47,000).								
1897–1901	76·8	1898	86·7	63·1	82·3	72·9	1900	82·8
1902–6	74·26	1906	79	61·7	83	72·3	1902	74·6
1907–11	83·84	1907	89·7	69·1	82·4	88	1908	99·6
Turks and Caicos Islands: Public Debt, Nil.								
1897–1901	8·6	1897	9·5	5·94	69	8	1897	8·4
1902–6	7·4	1902	8·7	5·28	71·3	7·86	1903	8·9
1907–11	7·9	1910	8·6	5·34	67·6	7·12	1911	7·7
Jamaica: Public Debt (1907–11), £3,860,000.								
1897–1901	806	1901	916	329	40·8	801	1900	906
1902–6	1,005	1903	1,076	386	38·4	919	1903	942
1907–11	1,191	1911	1,352	475	39·8	1,128	1911	1,260
St. Lucia: Public Debt (1907–11), £149,000.								
1897–1901	68	1900	72·1	33·2	48·6	63	1901	67·5
1902–6	65	1904	69·3	29·4	45·2	65	1903	70·7
1907–11	67	1911	72	32·8	48·9	66	1911	69·3
St. Vincent: Public Debt (1907–11), £2,050 (1912, £50).								
1897–1901	34·6	1899	63	13·6	39·3	33·4	1899	47·9
1902–6	27·6	1902	29	11·6	42	26·8	1902	28·4
1907–11	35·6	1911	34·8	13·56	38	29·4	1911	33·7
Barbados: Public Debt (1907–11), £415,700.								
1897–1901	181·7	1900	185·5	98·14	54	183·3	1899	207·9
1902–6	185·1	1906	204·7	102·3	55·2	183·2	1902	194·3
1907–11	206·1	1911	221·9	113·3	54·9	202·9	1911	215·7
Grenada: Public Debt (1907–11), £123,800.								
1897–1901	65·8	1900	70·4	34·2	51·9	61	1901	65·5
1902–6	70·6	1902	72·8	35·4	50·1	70	1905	71·9
1907–11	80·8	1911	98·6	42	51·9	74	1911	81
Cayman Islands: Public Debt, nil.								
1908–12	3·5	1908	4·57	1·5	42·8	3	1909	3·7

FINANCE

	Revenue.					Expenditure.		
Average of five years.	*Total Revenue.* £1,000.	*H.Y.*	£1,000.	*Average Customs* £1,000.	*% of total.*	*Total Expenditure.* £1,000.	*H.Y.*	£1,000.
Leeward Islands: Public Debt (1907–11), £270,800.								
1897–1901	120	1897	124·7	65	54·1	136·6	1899	142
1902–6	131	1906	138·1	71	54·2	133·8	1903	138
1907–11	159	1911	174·8	93	58·4	149·2	1910	159
Tobago and Trinidad: Public Debt (1907–11), £1,055,500.								
1897–1901	667	1901	712	290	43·48	668	1901	731
1902–6	803	1905	848	332	41·34	809	1905	870
1907–11	892	1911	951	392	43·94	877	1911	959
Bermuda: Public Debt (1907–11), £45,700.								
1897–1901	40·8	1901	49·4	32·6	79·9	38	1900	43·7
1902–6	54·8	1904	60·9	45	82·1	56·8	1906	63·7
1907–11	68·6	1911	79	57·4	83·6	66·7	1911	90·1
British Honduras: Public Debt (1907–11), £70,000; 1911, £195,000.								
1897–1901	58	1897	64	32	55	57	1897	65
1902–6	65	1906	80	34	52·3	58	1906	65
1907–11	86·7	1911	102	49	56·7	80	1911	100·7
British Guiana: Public Debt (1907–11), £891,000.								
1897–1901	514	1899	531	303	58·93	528	1897	564
1902–6	529	1902	549	325	61·44	512	1903	530
1907–11	550	1911	586	321	58·3	547	1911	588
Falkland Islands: Public Debt: Nil.								
1897–1901	14	1900	15·6	4·3	30·72	15	1901	17·6
1902–6	16	1903	17·4	4·98	31·13	14·8	1906	15·7
1907–11	19	1911	24·2	5·3	27·89	18·8	1911	22·5

H. Y. signifies highest year, i.e. the year in which highest returns were recorded during periods for which averages are given.

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Oxford: Horace Hart M.A. Printer to the University