

BUREAU OF THE AMERICAN REPUBLICS,

WASHINGTON, U. S. A.

- I. RECIPROCITY TREATIES AND TRADE.
- II. COMMERCIAL OUTLOOK IN BRAZIL.
- III. RAMIE CULTURE IN SOUTHERN COUNTRIES.
- IV. CACAO, BANANAS AND INDIA RUBBER IN COLOMBIA.
- V. DEVELOPMENT OF BRITISH GUIANA.
- VI. COMMERCIAL AND INDUSTRIAL INFORMATION.

BUREAU OF THE AMERICAN REPUBLICS,
NO. 2 LAFAYETTE SQUARE, WASHINGTON, D. C., U. S. A.

Director.—CLINTON FURBISH.
Secretary.—FREDERIC EMORY.

While the utmost care is taken to insure accuracy in the publications of the Bureau of the American Republics, no pecuniary responsibility is assumed on account of errors or inaccuracies which may occur therein.

CONTENTS.

	PAGE.
I. Reciprocity Treaties and Trade	9
II. Commercial Outlook in Brazil	22
III. Ramie Culture in Southern Countries.....	27
IV. Cacao, Bananas and India Rubber in Colombia.....	36
V. Development of British Guiana.....	59
VI. Commercial and Industrial Information—	
Argentine Republic.....	63
British Honduras.....	64
Chile.....	65
Jamaica.....	66
Mexico.....	69
Miscellaneous	73

PUBLICATIONS OF THE BUREAU.

Five monthly bulletins, in addition to the current issue, have been published by the Bureau of the American Republics, viz., "Coffee in America," October, 1893; "Coal and Petroleum in Colombia," etc., November, 1893; "Minerals and Resources of Northeastern Nicaragua," etc., December, 1893; "Finances of Chile," etc., January, 1894, and "Costa Rica at the World's Fair," etc., February, 1894.

Of the publications of the Bureau, the following will be furnished to applicants at the prices named in the list. All orders for these publications must be addressed to "The Public Printer, Washington, D. C.," and must be accompanied with the money for same. No money will be received by the Bureau or its officers:

PRICE LIST.

	Cents.
3. Patent and Trade-mark Laws of America.....	5
4. Money, Weights and Measures of the American Republics.....	5
6. Foreign Commerce of the American Republics.....	20
8. Import Duties of Brazil.....	10
10. Import Duties of Cuba and Puerto Rico.....	15
11. Import Duties of Costa Rica.....	10
13. Commercial Directory of Brazil.....	5
14. Commercial Directory of Venezuela.....	5
15. Commercial Directory of Colombia.....	5
16. Commercial Directory of Peru.....	5
17. Commercial Directory of Chile.....	5
18. Commercial Directory of Mexico.....	15
19. Commercial Directory of Bolivia, Ecuador, Paraguay and Uruguay...	5
20. Import Duties of Nicaragua.....	10
21. Import Duties of Mexico (revised).....	15
22. Import Duties of Bolivia.....	20
23. Import Duties of Salvador.....	5
24. Import Duties of Honduras.....	10

PUBLICATIONS OF THE BUREAU.

V

	Cents.
25. Import Duties of Ecuador.....	5
26. Commercial Directory of the Argentine Republic.....	5
27. Import Duties of Colombia.....	5
28. Commercial Directory of Central America.....	10
29. Commercial Directory of Haiti and Santo Domingo.....	5
30. First Annual Report of the Bureau, 1891.....	10
32. Handbook of Guatemala.....	35
33. Handbook of Colombia.....	30
34. Handbook of Venezuela.....	35
36. Import Duties of Venezuela.....	5
38. Commercial Directory of Cuba and Puerto Rico.....	10
39. Commercial Directory of European Colonies.....	10
42. Newspaper Directory of Latin America.....	5
43. Import Duties of Guatemala.....	25
44. Import Duties of the United States.....	5
45. Import Duties of Peru.....	25
46. Import Duties of Chile.....	25
47. Import Duties of Uruguay.....	25
48. Import Duties of the Argentine Republic.....	25
49. Import Duties of Haiti.....	10
50. Handbook of the American Republics, No. 3.....	50
51. Handbook of Nicaragua.....	50
53. Immigration and Land Laws of Latin America.....	40
55. Handbook of Bolivia.....	40
61. Handbook of Uruguay.....	50
62. Handbook of Haiti.....	50
63. How the Markets of Latin America may be Reached.....	40

PUBLICATIONS NOT NUMBERED.

Commercial Directory of Latin America.....	40
Second Annual Report of the Bureau, 1892.....	5
Third Annual Report of the Bureau, 1893.....	5
Manual de las Republicas Americanas, 1892.....	50

UNITED STATES CONSULATES.

Frequent application is made to the Bureau for the address of United States Consuls in the South and Central American Republics. Those desiring to correspond with any consul can do so by addressing "The United States Consulate" at the point named. Letters thus addressed will be delivered to the proper person. It must be understood, however, that it is not the duty of consuls to devote their time to private business, and that all such letters may properly be treated as personal and any labor involved may be subject to charge therefor.

The following is a list of United States Consulates in the different Republics :

ARGENTINE REPUBLIC—

Buenos Aires.
Cordoba.
Rosario.

BOLIVIA—

La Paz.

BRAZIL—

Bahia.
Para.
Perambuco.
Rio Grande do Sul.
Rio de Janeiro.
Santos.

CHILE—

Antofagasta.
Arica.
Coquimbo.
Iquique.
Talcahuano.
Valparaiso.

COLOMBIA—

Barranquilla.
Bogota.
Cartagena.
Colon (Aspinwall).
Medillin.
Panama.

COSTA RICA—

San Jose.

DOMINICAN REPUBLIC—

Puerto Plata.
Samana.
Santo Domingo.

ECUADOR—

Guayaquil.

GUATEMALA—

Guatemala.

HAITI—

Cape Haitien.
Port au Prince.

HONDURAS—

Ruatan.
Tegucigalpa.

MEXICO—

Acapulco.
Chihuahua.
Durango.
Ensenada.
Guaymas.
La Paz.
Matamoras.
Mazatlan.
Merida.
Mexico.
Nogales.
Nuevo Laredo.
Paso del Norte.
Piedras Negras.
Saltillo.
Tampico.

MEXICO—*Continued.*

Tuxpan.
Vera Cruz.

NICARAGUA—

Managua.
San Juan del Norte.

PARAGUAY—

Asuncion.

PERU—

Callao.

SALVADOR—

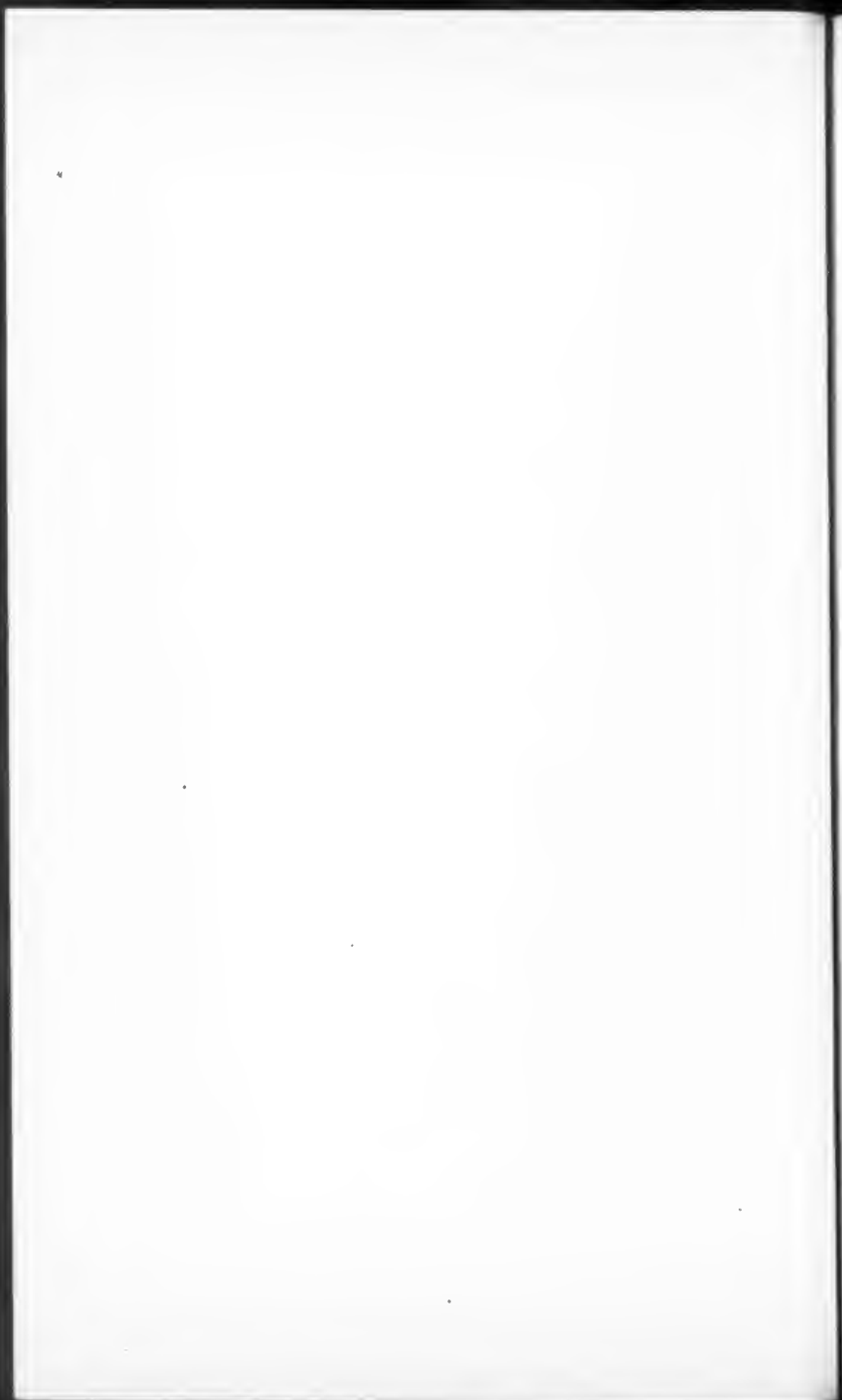
San Salvador.

URUGUAY—

Colonia.
Montevideo.
Paysandu.

VENEZUELA—

La Guayra.
Maracaibo.
Puerto Cabello.



RECIPROCITY TREATIES AND TRADE.

In his Annual Report for the year ending June 30, 1893, Mr. Worthington C. Ford, Chief of the Bureau of Statistics of the Treasury Department, prefaces the figures showing "Trade under the Reciprocity Treaties" with the following statement:

"Under the tariff act of 1890, commercial agreements were entered into with certain countries of South America and colonies of European nations. Some of the agreements have been in force for a period sufficient to gauge the effect, and they have been in force during two very exceptional years—1892, when the exports of domestic produce from the United States were the largest in its history, and 1893, when the imports of the United States also reached high-water mark. Whatever adverse influences could therefore apply to these agreements did not arise from conditions in the United States, but from conditions purely local to the countries with which it had entered into these commercial agreements. So far, therefore, as the United States is concerned, the experience of the last four years should be taken as conclusive upon the policy of these arrangements. It is also possible to gauge relatively the effect of the concessions contained in them by comparing the imports and exports into and from the United States of certain lines of articles with the commerce in similar lines of articles of other nations, nations enjoying no special privileges or concessions in these South American and West Indian markets. The policy can be judged only as any other natural force can be measured, by its results. Premising that the returns of imports into the United States for 1892 were overvalued in many important lines, I submit the following tables showing the trade of these reciprocity countries with the United States, United Kingdom, France and Germany. Comment is unnecessary.

"Under the reciprocity clause of the tariff act presidential proclamations were issued imposing duties upon the imports of sugar, hides and coffee from countries the customs regulations of which were believed to discriminate unduly against products of the United States. I need only refer to the decreased imports from the countries so affected, namely: Venezuela, Colombia, and Haiti, as evidence of their disastrous effect upon imports from those countries."

Commerce under Reciprocity.

The countries with which treaties of reciprocity are in force are Guatemala, Honduras, Nicaragua, Salvador, British West Indies, Santo Domingo, Cuba, Puerto Rico, Brazil and British Guiana. Analysis of the reports of commerce with those countries will afford some basis for conclusions as to the advantage to be derived from what is called reciprocity.

GUATEMALA.

Domestic products exported from the United States to Guatemala during the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton.....	\$ 86,139	\$ 79,310	\$ 89,742	\$ 87,663	\$ 79,816
Leather and manufactures of	15,620	13,323	25,318	27,075	22,929
Manufactures of iron and steel	106,569	232,385	270,037	147,002	151,184
Totals of all exports.....	\$969,571	\$1,326,001	\$1,971,001	\$1,809,577	\$1,713,142

Manufacturers of cotton goods will discover that their exports to Guatemala were over \$6,000 less in 1893 than in 1889. It is for them to determine whether the change has been due to the treaty made under the law of 1890. Manufacturers of iron and steel will find that as against \$232,385 of exports in 1890, which was an increase of more than 100 per cent. over the exports of the preceding year, their exports in 1893 fell to \$151,184. In manufactures of leather, the figures show an increase from 1890 to 1892 and thereafter a decrease.

Imports of coffee, hides and skins, and sugar from Guatemala into the United States during the years, ending June 30, 1889 to 1893 :

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee	\$2,095,720	\$1,988,423	\$2,275,107	\$2,923,271	\$2,325,000
Hides and Skins.....	80,022	106,343	99,834	37,481	64,483
Sugar	49,204	24,331	none.	none.	720
Totals	\$2,225,055	\$2,119,094	\$2,374,941	\$2,960,752	\$2,391,193

During the years 1889 and '90, there was a tariff levied upon the importation of sugar from Guatemala. That tariff was removed by the law of 1890.

HONDURAS.

Exports from the United States to Honduras during the years, ending June 30, 1889 to 1893 :

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton....	\$96,182	\$105,437	\$76,702	\$91,314	\$67,733
Manufactures of iron and steel.....	93,392	41,172	83,590	54,598	44,521
Leather and manufactures of	10,491	10,485	6,049	10,859	7,836
Totals of all exports....	\$618,973	\$522,631	\$583,114	\$478,947	\$442,907

Imports from Honduras to the United States of articles affected by the reciprocity treaty:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee.....	\$418,690	\$39,436	\$9,845	\$18,757	\$16,907
Sugar	3,249	none.	none	none.	none.
Totals of all imports....	\$54,247	\$92,667	\$50,998	\$77,573	\$49,614

It will be noted that the imports of sugar from Honduras into this country ceased in 1889. Also, that the total of imports in 1893 were over \$40,000 less than in 1890.

NICARAGUA.

Exports of leading products from the United States to Nicaragua for the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton....	\$105,339	\$96,911	\$106,524	\$81,177	\$61,569
Manufactures of iron and steel.....	86,548	158,446	168,550	120,162	76,932
Leather and manufactures of	32,864	36,613	49,385	47,965	33,602
Totals of all exports....	\$900,813	\$1,270,073	\$1,592,013	\$1,187,189	\$812,684

Imports from Nicaragua into the United States for the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee.....	\$633,216	\$642,467	\$635,354	\$426,637	\$155,183
Totals of all imports....	\$814,669	\$797,284	\$368,209	\$595,098	\$276,447

Both in the exports to and the imports from Nicaragua, commerce has decreased since 1890. Of sugar, there was a little over \$1,000 worth imported in 1891, and no imports of this article since that time.

SALVADOR.

Exports of leading products from the United States to Salvador for the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton....	\$183,220	\$120,481	\$221,750	\$168,817	\$106,247
Manufactures of iron and steel.....	84,711	155,798	127,193	122,339	145,439
Leather and manufactures of	9,327	3,013	3,872	5,353	3,202
Totals of all exports....	\$690,884	\$886,231	\$1,134,995	\$1,274,021	\$1,118,054

Imports from Salvador into the United States for the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee.....	\$1,510,628	\$1,305,894	\$1,570,869	\$2,372,251	\$1,282,990
Sugar.....	26,188	69,846	49,844	11,795	4,367
Totals of all imports....	\$1,562,698	\$1,392,971	\$1,734,701	\$2,300,925	\$1,305,516

In the matter of exports from this country to Salvador, these figures show a phenomenal increase from 1889 to 1891, and a decrease between 1891 and 1893. In the exports from Salvador into the United States, there has been a decrease of something over \$200,000 since 1889.

BRITISH WEST INDIES.

Exports of leading products from the United States to the British West Indies during the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton....	\$178,392	\$181,354	\$188,885	\$163,485	\$187,971
Manufactures of iron and steel	124,710	110,203	175,747	161,101	163,215
Leather and manufactures of	121,040	146,564	122,804	90,036	77,257
Totals of all exports....	\$8,197,693	\$8,074,433	\$9,546,058	\$7,965,185	\$7,912,341

Imports from the British West Indies into the United States for the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee.....	\$1,689,217	\$803,281	\$817,833	\$1,065,559	\$1,164,120
Sugars (free)	None.	None.	3,740,762	7,037,228	9,635,275
Sugars (dutiable).....	9,960,479	9,910,130	6,130,585	7	45
Totals of all imports....	\$11,699,942	\$9,758,645	\$9,760,183	\$8,138,945	\$11,833,337

High-water mark was reached in the totals of exports to the British West Indies from this country in 1891. The decline since that time has been marked, exceeding the increase from 1889 to 1891. In spite of this decrease of exports to the British West Indies, the figures show a net increase in the amounts of products received from those countries. This is due to the increase in the importation of sugar since the removal of the tariff duty upon that article.

SANTO DOMINGO.

Exports of leading products from the United States to Santo Domingo during the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton....	\$126,327	\$66,525	\$52,917	\$62,601	\$101,336
Manufactures of iron and steel	161,207	126,937	173,119	236,768	218,705
Leather and manufactures of	23,527	9,320	9,911	7,090	8,692
Totals of all exports....	\$1,150,651	\$926,651	\$986,826	\$984,188	\$1,108,738

Imports from Santo Domingo into the United States during the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee.....	\$100,868	\$49,443	\$51,972	\$38,041	\$111,823
Sugars (free).....	None.	None.	689,463	2,017,739	2,054,201
Sugars (dutiable).....	1,143,523	1,715,460	593,168	None.	42
Totals of all imports..	\$1,305,888	\$1,842,182	\$1,420,106	\$2,137,427	\$2,249,429

The figures of commerce between Santo Domingo and the United States show a gratifying increase of trade, the amount of sugars received since the removal of the duty having almost doubled.

CUBA.

Exports of leading products from the United States to Cuba during the years, ending June 30, 1889 to 1893:

ARTICLES	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton....	\$126,180	\$130,418	\$101,799	\$114,112	\$148,178
Manufactures of iron and steel.....	1,302,828	1,669,940	1,691,731	2,418,078	3,964,582
Leather and manufactures of	166,334	194,330	172,813	277,386	181,446
Totals of all exports....	\$11,297,198	\$12,669,509	\$11,929,605	\$17,622,411	\$23,604,694

Imports from Cuba into the United States during the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee.....	\$12,420	\$1,130	\$1,942	\$1,477	\$395
Sugars and molasses (free)....	None.	None.	22,882,647	62,644,399	61,718,665
Sugars & molasses (dutiable)	39,644,243	39,099,670	23,947,261	213	39
Totals of all imports....	\$39,900,919	\$39,384,417	\$47,186,402	\$62,918,599	\$61,998,252

How important Cuba is as a market for the products of this country is well shown in the above figures. Manufacturers in all branches may study these figures with profit. They will see that there is a large margin between the imports and exports which might be filled with products of American manufacture under proper conditions and with proper effort.

PUERTO RICO.

Exports of leading products from the United States to Puerto Rico during the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton.....	\$18,727	\$30,144	\$22,520	\$34,048	\$15,744
Manufactures of iron and steel	50,598	59,295	65,538	55,550	106,883
Leather and manufactures of	10,143	9,509	12,625	9,800	9,291
Totals of all exports....	\$2,175,458	\$2,247,700	\$2,112,334	\$2,808,631	\$2,502,788

Imports from Puerto Rico into the United States during the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee.....	\$48,290	\$140,435	\$39,686	\$26,891	\$23,814
Sugars and molasses (free)..	None.	None.	1,775,177	3,169,736	3,336,427
Sugars and molasses (dutiable).....	3,570,623	3,861,247	1,286,147	None.	1,411
Totals of all imports....	\$3,621,353	\$4,002,746	\$3,101,010	\$3,197,623	\$3,961,652

BRAZIL.

Exports of leading products from the United States to Brazil during the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
(Admitted free of duty)					
Agricultural implements....	\$ 31,848	\$ 49,610	\$ 70,633	\$ 31,383	\$ 36,159
Breadstuffs.....	4,064,809	4,940,765	4,348,948	5,158,138	3,709,10
Manufactures of iron and steel.....	708,688	745,250	1,832,329	1,813,739	1,443,49
Totals of all exports....	\$5,372,014	\$6,818,372	\$8,181,791	\$9,000,969	\$6,335,873

(Admitted into Brazil with a reduction of duty of 25 per cent.)

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton.....	\$631,094	\$813,700	\$581,974	\$749,370	\$1,402,569
Manufactures of iron and steel.....	207,164	193,409	1,832,529	1,813,739	1,443,450
Leather and manufactures of (except boots and shoes)...	10,053	14,667	19,964	15,572	16,134
Totals of all exports....	\$9,276,511	\$11,902,496	\$14,049,273	\$14,240,009	\$12,339,584

Imports from Brazil into the United States during the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee.....	\$44,891,739	\$45,664,127	\$62,022,022	\$95,751,724	\$57,136,680
Sugar and molasses (free)...	None.	None.	2,860,204	4,468,145	2,921,946
Sugar and molasses (dutiable).....	4,838,121	1,659,251	2,280,919	41,136	None.
Totals of all imports...	\$51,961,951	\$49,501,260	\$69,678,489	\$103,035,951	\$62,257,685

Because of the internal disturbances in Brazil, by which all commerce was impeded, these figures give only a hint as to the natural increase in the trade between the two countries. While the receipts of coffee have fallen off during the last eighteen months, it is very apparent from the increase in the trade of that article from 1889 to 1892 that there is a strong natural tendency for trade between the United States and this southern republic.

BRITISH GUIANA.

Exports of leading products from the United States to British Guiana during the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton....	\$25,699	\$94,491	\$22,368	\$33,761	\$24,421
Manufactures of iron and steel.....	17,064	14,198	21,825	55,654	17,177
Leather and manufactures of	11,289	10,257	4,624	5,317	3,120
Totals of all exports....	\$1,643,249	\$2,011,122	\$1,761,350	\$1,885,542	\$1,943,012

Imports from British Guiana into the United States during the years ending June 30, 1889, to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee.....					\$384
Sugars and molasses (free).....			\$973,470	\$4,361,052	5,017,661
Sugars and molasses(dutiable)	\$4,510,235	\$4,324,545	3,892,602	8	
Totals of all imports....	\$4,510,235	\$4,324,545	\$4,866,072	\$4,361,060	\$5,019,397

Retaliatory Proclamations.

The following proclamation was issued under the authority conveyed in the tariff act of 1890. It applied in the same terms to the Republics of Colombia, Venezuela and Haiti. The proclamation was as follows :

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA.—
A PROCLAMATION.

Whereas in Section 3 of an Act passed by the Congress of the United States entitled "An Act to reduce the revenue and equalize duties on imports, and for other purposes," approved October 1, 1890, it was provided as follows :

"That with a view to secure reciprocal trade with countries producing the following articles, and for this purpose, on and after the first day of January, eighteen hundred and ninety-two, whenever, and so often as the President shall be satisfied that the Government of any country producing and exporting sugars, molasses, coffee, tea, and hides, raw and uncured, or any of such articles, imposes duties or other exactions upon the agricultural or other products of the United States, which, in view of the free introduction of such sugar, molasses, coffee, tea and hides into the United States, he may deem to be reciprocally unequal and unreasonable, he shall have the power and it shall be his duty to suspend, by proclamation to that effect, the provisions of this Act relating to the free introduction of such sugar, molasses, coffee, tea and hides, the production of such country, for such time as he shall deem just, and in such case and during such suspension duties shall be levied, collected and paid upon sugar, molasses, coffee, tea and hides, the product of or exported from such designated country" the duties hereinafter set forth :

And whereas it has been established to my satisfaction, and I find the fact to be, that the Government of Colombia does impose duties or other exactions upon the agricultural and other products of the United States, which, in view of the free introduction of such sugars, molasses, coffee, tea and hides into the United States, in accordance

with the provisions of said Act, I deem to be reciprocally unequal and unreasonable :

Now, therefore, I, Benjamin Harrison, President of the United States of America, by virtue of the authority vested in me by Section 3 of said Act, by which it is made my duty to take action, do hereby declare and proclaim that the provisions of said Act relating to the free introduction of sugars, molasses, coffee, tea and hides, the production of Colombia, shall be suspended from and after this fifteenth day of March, 1892, and until such time as said unequal and unreasonable duties and exactions are removed by Colombia and public notice of that fact given by the President of the United States, and I do hereby proclaim that on and after this fifteenth day of March, 1892, there will be levied, collected and paid upon sugars, molasses, coffee, tea and hides, the product of or exported from Colombia, during such suspension, duties as provided by said Act, as follows :

All sugars not above number thirteen Dutch Standard in color shall pay duty on their polariscopic tests as follows, namely :

All sugars not above number thirteen Dutch Standard in color, all tank bottoms, sirups of cane juice or of beet juice, melada, concentrated melada, concrete and concentrated molasses, testing by the polariscope not above seventy-five degrees, seven-tenths of one cent per pound; and for every additional degree or fraction of a degree shown by the polariscopic test, two hundredths of one cent per pound additional.

All sugars above number thirteen Dutch Standard in color shall be classified by the Dutch Standard of color, and pay duty as follows, namely: All sugars above number thirteen and not above number sixteen Dutch Standard of color, one and three-eighths cents per pound.

All sugar above number sixteen and not above number twenty Dutch Standard of color, one and five-eighths cents per pound.

All sugars above number twenty Dutch Standard of color, two cents per pound.

Molasses testing above fifty-six degrees, four cents per gallon.

Sugar drainings and sugar sweepings shall be subject to duty either as molasses or sugar, as the case may be, according to polariscopic test.

On coffee, three cents per pound.

On tea, ten cents per pound.

Hides, raw or uncured, whether dry, salted or pickled, Angora goat skins, raw, without the wool, unmanufactured, asses' skins, raw or unmanufactured, and skins, except sheep-skins, with the wool on, one and one-half cents per pound.

In witness whereof, I have hereunto set my hand and caused the seal of the United States to be affixed.

Done at the City of Washington, this fifteenth day of March, one thousand eight hundred and ninety-two, and of the Independence of the United States of America the one hundred and sixteenth.

BENJ. HARRISON.

By the President:

WILLIAM F. WHARTON,

Acting Secretary of State.

Countries affected by the President's Proclamation of March 15, 1892.

COLOMBIA.

Exports of leading products from the United States to Colombia during the years, ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton.....	\$254,407	\$171,278	\$290,367	\$296,198	\$219,980
Manufactures of iron and steel.....	341,737	306,692	278,417	282,481	292,209
Leather and manufactures of	76,182	24,594	49,448	54,873	47,589
Totals of all exports....	\$3,728,961	\$2,522,351	\$3,108,989	\$3,065,466	\$3,047,620

Imports from Colombia into the United States during the years, ending June 30, 1889 to 1893 :

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee (free).....	\$2,170,963	\$1,849,441	\$2,491,811	\$1,620,965	\$ 451
Coffee (dutiabie).....				367,714	1,391,801
Sugar and molasses (free).....				21	
Sugar and molasses (dutiabie).....	27,309			28	
Totals of all imports.....	\$3,126,138	\$2,479,540	\$3,259,603	\$1,586,039	\$2,057,488

VENEZUELA.

Exports of leading products from the United States to Venezuela during the years, ending June 30, 1889 to 1893 :

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton.....	\$466,143	\$429,094	\$565,242	\$426,606	\$427,538
Manufactures of iron and steel.....	212,091	259,156	383,825	320,912	234,063
Leather and manufactures of.....	15,117	19,534	29,488	20,162	13,518
Totals of all exports.....	\$3,703,705	\$3,984,280	\$4,716,047	\$3,991,908	\$4,142,051

Imports from Venezuela into the United States during the years, ending June 30, 1889 to 1893 :

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee (free).....	\$ 9,138,591	\$ 9,662,207	\$10,814,874	\$8,229,872	\$ 61,537
Coffee (dutiabie)				865,170	2,410,806
Hides and skins (free).....	861,582	812,347	898,492	590,021	972
Hides and skins (dutiabie).....				90,680	657,569
Totals of all imports.....	\$10,000,473	\$10,474,559	\$11,713,366	\$9,825,743	\$3,110,884

HAITI.

Exports of leading products from the United States to Haiti during the years, ending June 30, 1889 to 1893 :

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Manufactures of cotton.....	\$536,711	\$749,954	\$676,666	\$544,574	\$722,647
Manufactures of iron and steel.....	189,711	128,449	37,396	58,711	58,849
Leather and manufactures of.....	33,230	76,915	50,103	29,589	51,334
Totals of all exports.....	\$3,975,461	\$5,101,464	\$5,589,178	\$4,963,430	\$5,170,634

Imports from Haiti into the United States during the years ending June 30, 1889 to 1893:

ARTICLES.	1889.	1890.	1891.	1892.	1893.
Coffee (free).....	\$2,706,194	\$1,270,247	\$1,988,943	\$2,191,774	.....
Coffee (dutiable).....	.....	.....	.....	5,550	929
Hides and skins (free).....	41,215	30,391	24,020	18,155	82
Hides and skins (dutiable).....	.....	.....	.....	4,256	16,902
Sugar and Molasses (free).....	.....	.....	.....	535	.....
Sugar and molasses (dutiable).....	4,430	.....	32,995	.....	.....
Totals of all imports...	\$2,831,839	\$1,300,638	\$2,045,967	\$2,220,270	\$17,973

Manufacturers of the products noted in the above lists may draw their own conclusions as to the effect of retaliatory measures upon trade. Manufacturers of leather will strive in vain to regain that portion of the trade they seem to have lost in Venezuela and Colombia, unless steps shall be taken to remove the barrier erected by the proclamation. How strong the tendency is to trade between these countries can be seen by examination of some of the above items. In spite of the hostile measure adopted by the United States, the exports of leather and its manufactures to Haiti increased after the issuance of the proclamation. This is in spite of the fact that the importation of coffee from that country has practically ceased. This applies also to the figures showing the totals of exports to Colombia. Losing largely in the imports of coffee, the totals of exports show but slight variation. The most apparent effect of legislative interference seems to have been the restriction of the natural tendency to trade.

II.

COMMERCIAL OUTLOOK IN BRAZIL.

By the termination of the naval revolt in the port of Rio de Janeiro, the obstacles put in the way of the trade of the capital by the insurgent vessels have been removed. Doubtless, the commercial movement will return to its former conditions, and we may expect to see a considerable increase in imports and exports, as has been the case in the other ports of the Republic of Brazil.

During the last three months of the revolt, the trade of Rio fell off proportionally more than in the two preceding months, the decrease amounting to about one-third from the corresponding period of 1893; but the energetic action of Admiral Benham in forcing the insurgents to abandon their interference with American vessels stimulated the naval commanders of other foreign war vessels in port to afford a better protection to the trade of their countries, so that, in spite of the severity of the epidemic of yellow fever, the customs receipts had begun to show a considerable increase, even before the collapse of the revolt.

Whether or not the tariff legislation pending in the United States Congress shall abrogate the commercial agreement existing between Brazil and this country since April 1, 1891, there can be no doubt that the friendly feeling excited by the attitude of the United States Government and the sympathy of the American people with the lawful Republican Government of Brazil will lead to still closer commercial relations between the two nations, and to a considerable increase in their commerce with each other. That feeling has been recently expressed in a communication from the Brazilian Government to a leading American journal, and has been publicly manifested on several occasions in the beleaguered capital of that country. The significance of the expression in the communication referred to, that the government and people of the United States have "materially

aided" in the success of the lawful authorities, will be best appreciated by those who know most in regard to the assistance rendered by this country. That it has been effective none can doubt.

At this writing, the insurgents hold only the unimportant City of Desterro and the small island on which it is situated, with only two war vessels and some scattered bands of cavalry in the States of Paraná and Rio Grande do Sul. The ports of these States are in the hands of the lawful government, and their commerce has not been interfered with.

It cannot be long before the pacification of the entire country will permit a renewal of the spirit of enterprise and development which showed itself so markedly soon after the establishment of the Republic. Few are aware of the material progress made by Brazil in the short time since the downfall of the Empire, and of the vigorous advance made by the States of the Brazilian Union under the new *régime*.

Perhaps the best evidence of the general industrial awakening, next to the great increase in the commerce of all the ports, is furnished by the fact that in all the States in which, under the Empire, there was an annual deficit to be made up from the imperial Treasury, a surplus has been realized. Decentralization, with the consequent abandonment of paternalism, aroused the slumbering activities and directed them to the development of the abundant resources of the country, varying with the locality, but always remunerative.

The advances made in trade and manufactures have been accomplished in spite of a depreciated currency, whose bad condition is in great part due to the hostile financial policy of certain powerful banking interests which, partly from gratitude for favors received from the defunct régime, and partly from more selfish motives, have opposed the re-organization of the finances of the Republic. Brazilians complain that the same influences have been supplying the insurgents with the means of prolonging the revolt.

In the absence of official statistics for the commerce of the several ports of Brazil, we may refer to the estimates of the Minister of Finance for the annual budgets, in order to form an idea of the general increase in commerce since the establishment of the Republic. According to

these estimates the amounts to be supplied by duties on imports were as follows:

1890.....	100,487,443	milreis.
1891.....	106,217,526	"
1892.....	131,175,104	"
1893 (First quarter year).....	31,943,666	"

The customs receipts from import duties alone at Rio de Janeiro, whose foreign commerce represents about one-half of that of the entire country, are officially given as follows:

1889.....	48,947,325	milreis.
1890.....	50,157,404	"
1891.....	71,149,849	"
1892.....	84,349,201	"
1893 (First half year).....	53,164,830	"

For the whole country, the customs receipts for the same period are given as follows:

1889.....	90,216,071	milreis.
1890.....	100,487,442	"
1891.....	106,217,526	"
1892.....	131,175,103	"
1893 (First quarter year).....	47,973,315	"

It will be seen from the above that the imports for the whole country have increased more rapidly than those of the port of Rio de Janeiro, a result that may be attributed to the effects of the political decentralization before alluded to.

An exact comparison of commercial data for different periods is rendered difficult by the fluctuating value of Brazilian money, in which statistics are stated, so that the increase in trade shown by them is sometimes more apparent than real. The par value of the Brazilian milreis is 27 pence sterling, and the fluctuations to which it is subject may be seen from the fact that in 1888 the average par value was $25\frac{1}{4}$ pence; in 1889, $26\frac{13}{16}$ pence; in 1890, $22\frac{5}{8}$ pence; in 1891, 16.33 pence; in 1892 and 1893, about 11.5 pence.

Another fact that complicates the comparison is that the duties have sometimes been collected in gold, which has always been at a premium, without taking into account the difference between the metal and the paper in making up the tables of the statistics.

The exports of coffee, nearly all through the ports of Rio and Santos, show a considerable falling off for the year 1892-93, compared with those of 1891-92, particularly for Rio, whence 2,808,657 bags of 132 pounds each were exported in 1892-93 against 3,725,818 in the previous year.

The exports of coffee from Santos were 3,411,498 bags in 1892-93, against 3,588,142 in 1891-92. From Santos, in 1892-93, 2,288,478 bags were sent to Europe, and 1,118,789 to the United States; while in the same year from Rio 1,884,287 bags went to the latter country, against 775,297 exported to Europe.

It thus appears that as a port of export for the great staple of Brazil, Santos has become more important than Rio de Janeiro.

The exports of coffee from Victoria, the capital of the State of Espirito Santo, have increased from 105,270 bags in 1891-92 to 185,606 in 1892-93; of this latter amount, the United States took 146,393 bags, and 39,300 went to Europe.

There are no official statistics of coffee exports. The above figures are taken from the "Rio News," and are regarded as a very conservative estimate. Another authority puts the exports of coffee from Rio for 1892-93 at 2,943,191 bags. The exportations of coffee from Bahia, formerly insignificant, have latterly reached considerable importance. In consequence of the diminished exports, the price of that staple has reached a price unknown for years, which appears likely not to be soon materially less, if the estimates for the crop of 1893-94 are well founded. A well-known Rio exporting house estimates the probable crop for this year at about 3,000,000 bags, smaller than for many years. The stock on hand June 30, 1893, in Rio was only 117,000 bags.

The Brazilian planters, however, are better satisfied with a short crop and long prices than with a large one that brings the unremunerative prices of a few years ago; so that with an increasing export of rubber at 70 cents per pound and almost unexampled prices for her other great staples, Brazil now appears to be able to set her finances in order and increase her commerce.

The latest trustworthy statistics of the rubber export from the Amazon ports of Pará and Manáos put the total for 1891 at 160,474 tons, valued at over \$30,000,000.

The effects of the reciprocity convention between the United States and Brazil, which according to the Report of the British Foreign Office, No. 1321, caused "considerable alarm by the serious injury which it was feared might result to British trade," appear to have been other than those apprehended. It was feared that American cotton goods, with an advantage of twenty-five per cent. in the import duty, would exclude certain classes of English manufacture. Complete statistics for comparison are not yet accessible, but a partial comparison shows that while the exportation of cotton goods from the United States to Brazil, according to the New York "Commercial Bulletin," during the eight months ending February, 1893, had increased 5,815,000 yards over that of the corresponding period of 1892, the British Board of Trade returns show an increase in the exports of cotton goods from Great Britain to Brazil, of 20,193,000, for the three months ending March 31, 1893, compared with the corresponding quarter of 1892.

This would seem to indicate that some influence more potent than reciprocity has governed the trade between Brazil and the two countries named, at least in cotton goods.

By the election, on the first of March, of a civilian as President of the Republic for the four years beginning November 15, 1894, the outlook for political peace and stability in Brazil is bright and full of promise for commercial prosperity; as the political and financial interests that have hitherto disturbed the nation must be now convinced of the hopelessness of further efforts. American merchants and manufactures have now an undisputed advantage in the competition for Brazilian trade, and on their enterprise depends the securing of a larger share than has heretofore been enjoyed.

III.

RAMIE CULTURE IN SOUTHERN COUNTRIES.

The possibilities of ramie fibre culture in Mexico, the West Indies and Central and South America, have attracted renewed attention from the efforts of Mr. Walter J. Hollier of New Orleans to stimulate interest in the subject. Mr. Hollier has recently visited Colombia and Jamaica with this object in view, and also, to introduce a newly invented machine which, he claims, will solve the problem of preparing ramie for market in a rapid and economical manner. At a meeting held at the Jamaica Institute, at which the Governor of the colony was present, Mr. Hollier described the prospects for ramie culture in Jamaica, and expressed the opinion that it would prove very profitable. The Governor, Sir Henry Blake, said there were two fibres which can undoubtedly be produced in Jamaica: the sisal hemp and ramie. The cultivation of sisal has already been undertaken at the plantation of Colonel Ward, and is said to be doing well. The production of sisal hemp, however, is one requiring capital, while ramie can be raised by small as well as large growers. The Governor said: "If, in the future, the cultivation of ramie were carried out to a sufficient extent, and if a large area were put under this cultivation, I do not think it is an impossible thing that capital may be induced to come to this island, not alone for the decorticating and degumming of this fibre, but for the purpose of utilizing our magnificent water-power for working up this and other fibres into textile fabrics." The Governor also expressed the opinion that India rubber may be profitably grown in Jamaica, and recommended the extensive planting of India rubber trees.

A paper on the ramie fibre prepared by Mr. Hollier was read before the meeting. Mr. Hollier says:

Rhea fibre is a textile material, produced by one or two more species of *Bœhmeria* (natural order *Urticacex*) plants found over a

wide range in India, China, the Malay Peninsula and islands, and Japan. Rhea is also capable of growth in temperate latitudes, and has been introduced into the South of France, Algeria, Italy, Spain and some parts of the United States. Its introduction into France was immediately caused by the ravages of the Phylloxera among the vines in that country. So far as I am aware, there are four different varieties of the plant known in Botany, viz :

- (1) "*Behmeria Nivea*" distributed over Eastern Asia, and commonly but very inappropriately called China Grass.
- (2) "*Behmeria Tenacissima*" also found through Eastern Asia.
- (3) "*Behmeria Sanguinea*" found in Java.
- (4) "*Behmeria Puva*," an allied plant commonly called "Pooah" found growing wild in the North of India.

All these varieties of the plant are sources of the Rhea fibre, but the three first mentioned varieties are called indiscriminately by the Malay name "RAMIE."

B. Nivea and *B. Tenacissima* are the most important as fibre producing plants; the former was the earliest known and derived its distinctive appellation from the white color under the leaf. The latter was named by Roxburgh "*Tenacissima*" on account of the superiority of the strength of its fibre over that of various fibres then known, and on which he experimented in India. The leaves of the *Tenacissima* unlike the *Nivea*, are entirely green, with grey veins on the under surface. Both these varieties, I learn, have been for a long time cultivated here in the Government gardens with the most happy results.

The *B. Nivea*, although the first known and most extensively used in China, yields the place to the *B. Tenacissima* as the most valuable plant of any of the varieties.

According to Royle, the fibre of the *Tenacissima* is stronger than that of any other plant, its force being expressed in comparison with the following fibres, thus :—

Hemp represented at.....	160
Agave fibre.....	100
Ramie fibre.....	280

Aston gives the following result of his experiments with untwisted fibre.

B. Nivea of China.....	250
Cultivated Ramie of Assam (B. Tenacissima).....	310
Wild Ramie of Assam (B. Tenacissima).....	343
Yakka fibre.....	175
St. Petersburg Hemp.....	160

The fibre of *B. Tenacissima* first appeared in the European market in 1810 and a cord then spun from it was found to sustain a weight of 252 lbs., while a similar cord of Russian hemp was estimated by Admiralty test not to bear more than 84 lbs., so that the Ramie cord was more than three times as strong as the Russian Hemp.

It thus clearly appears from these considerations alone, that *B. Tenacissima* is to be preferred for qualities of strength to the *B. Nivea*.

It has been further demonstrated that *Tenacissima* produces more fibre, on the whole, than the *Nivea*.

Goncet de Mas of Padua, has given his opinion that the *Tenacissima* is more hardy and will stand prolonged droughts and floods more readily than the *Nivea*. This, however, has not been my experience in the Southern States of the United States; there the *B. Nivea* does much better on poor land and produces a much larger quantity of seed, which appears in clusters near the top of stalk. It has less gum, and is therefore easier to degum; and both the stalk and the decorticated ribbons dry readily. Its ultimate or primitive fibre, is very white, though it is not nearly so lustrous, and is only about half as long as that of the *Tenacissima*, which has a creamy shade, with a beautiful silken lustre. When immersed in water it is perfectly white.

Ramie is of growing value as a fibre plant. It is a shrubby plant growing to the height of from five to eight feet, with foliage and inflorescence like the common nettle, but destitute of stinging hairs; it is the most prolific of textile plants. In Natal, an indigenous variety grows to the enormous height of twenty-four feet.

The plant thrives in hot, moist, shaded situations, and prefers light loamy and sandy soils, and will yield from three to five crops per annum.

All the varieties of Ramie have a very rapid growth, and according to the fertility of the soil, increase for years in quantity by shoots springing up from the roots.

The United States agricultural reports for 1867 (p. 220) give an account of Mr. F. J. Knapp's successful experiment in propagating Ramie by the subdivision of the roots and by layers. It states that from 100 roots planted in March he produced 40,000 plants in nine months. This shows how easily and rapidly the plant may be propagated and demonstrates that a Ramie plantation is within the reach of every planter and that at a trifling cost.

In Louisiana, where the soil can in no way compare with the soil of this Island, and where the planters do not facilitate the overtaxed soil, a field once planted will last with proper care for four to five years; at the expiration of that time, the roots should be ploughed out and replanted, after the soil has been manured.

Ramie is no new thing. It is well known that its cultivation and use as a textile in China and Japan dates back to immemorial time. For thousands of years, the Chinese have used it in their silk manufacture, a fact first detected many years ago by a Russian trader.

Rhea is used in Eastern Asia for a variety of purposes such as fishing nets, cordage, ropes, sails and for textile fabrics as well. In Europe it is used in combination with silk, wool and cotton, in the manufacture of dress stuffs, curtains, carpets, rugs, damasks, table cloths, towels, sheets, laces, handkerchiefs, hosiery and thread. It has also been demonstrated that a material can be made of Rhea, closely resembling leather, and suitable for bands for machinery, and that a three inch Rhea band was equal to a nine inch leather band, leather costing five cents per pound and Rhea band estimated at one cent per pound.

Rhea unmixed is also now being made into textile fabrics and their extreme beauty gives assurance that the demand will increase with the supply. These fabrics are as beautiful as silk and as durable as linen. Indeed, as already stated, China silk contains a large proportion of Rhea, and there is no doubt that if these

fabrics can be produced at a reasonable cost, people will soon come to prefer them.

The governments of several countries—not omitting to mention Jamaica—have from time to time offered large cash prizes for the invention of machines and processes capable of preparing the fibre for manufacture on a scale large enough and sufficiently economically to meet the demands of commerce. Thousands of pounds have been spent and hundreds of inventions have been devised and experimented with—hitherto in vain.

The tedious and expensive methods of preparation practiced by the natives of China and the East Indies and the somewhat more efficient machinery and processes now in use in Europe, have proved quite inadequate to furnish the prepared fibre in any considerable quantity or at a cost which will allow it to compete with other textile materials, and manufacturers have hitherto found it impossible to obtain anything like a sufficient supply to meet their wants.

A number of English firms, notably Surol, E. G. Lester, Sangster, Wade & Son, Whittaker of Bradford, Wm. Hutchison & Co., of London, and the China Glass Company have undertaken the manufacture of Rhea and have followed it up energetically, though with indifferent success, owing to the insufficiency of the supply.

The *Manufacturers' Record* of America, of January 10th, 1892, says: "Specimen pieces of carpet have already been manufactured of Ramie by Johnson and Wolf, of Allegany and Kensington. Fish nets, cordage, twine of all sorts, knit underwear, carpet and duck, are made at other mills of the product known as Ramie. Hamilton Disston has now upon his Florida farm several acres of Ramie; some of it is being grown in New Jersey, and a small quantity is raised in South Carolina and California. But the greater portion of it is imported from China. Williams & Co. of New York have just contracted for three tons a day. Chicago has started an opposition company, but this has failed so far to place its contracts for a regular supply. All this has shown a growing demand for the staple. The workings of the fibre on woolen mill machinery was demonstrated in June and July, 1890, in Mr. A. M. Ulman's mill at Waveland,

Miss. Mr. Ulman was unable to obtain a regular supply of the fibre, but he manufactured some very fine woolen goods with Rhea as also some with Rhea and wool mixed in the warp in various proportions. Some of these goods were sold in New Orleans and others in the West. Mr. Ulman thinks that mixing Rhea with the wool is a decided advantage to the goods. The goods are stronger for it and take a more glossy finish."

The time is now come when Rhea pushes itself upon attention as a most important accession to agriculture. This is made apparent in the report of C. R. Dodge, special agent, U. S. Department of Agriculture (Report No. 1, 1890, page 32), in which he says:

"Probably no one fibre interest represented in the Paris exhibition of 1889 attracted more attention than Ramie, nearly every country of any prominence which took part in the exposition either sending specimens of fibre to show the results of experiments or progress of its own culture, or commissioning representatives to ascertain the latest facts concerning it. The U. S. Department of Agriculture made a small display of Ramie, illustrating the simple fact that the plant can be grown successfully."

The only obstacles our home manufacturers say, in the way of its extensive use, are the difficulty of obtaining a regular supply, and the lack of adequate machinery and process for decorticating and degumming the fibre. Every pound of decorticated fibre now imported into the United States costs the manufacturer seven to eight cents.

These facts demonstrate that there is already a demand for Ramie fibre sufficient to make its cultivation not only profitable, but a thing to be eagerly pursued provided a practicable and economical method of preparing the fibre for market is found.

That Ramie would be a most desirable and important accession to the products of Agriculture of Jamaica, admits of no question. The profit in its production and preparation for market are the only points to be considered.

There are two elements that enter into the solution of this problem: (1) cost of cultivation and (2) the preparation of the material for

market in a rapid and economical manner, by removing the bark from the stalks without cutting or breaking the fibre and by separating the gummy adherent matters from the fibre without injuring its strength or fineness.

These desiderata have hitherto baffled all the ingenuity of hundreds of inventors. * * * * *

I propose to deal with the second element of the problem first, and that shortly, as owing to the fact that the arrangements to procure letters patent for the machinery and process which I am about to allude to have not been completed, it would be premature and contrary to the interest of the inventor to give details descriptive of the machinery and process. We will now glance at the machinery in use in Europe for the preparation of the fibre for market.

In a lecture given by the late Hon. James Cecil Philippo, M. D., who took a great personal interest in the Ramie industry, published in the Transactions of the Institute of Jamaica 1884-85, from a perusal of which I have gathered much valuable information relative to the growing of Ramie in Jamaica and elsewhere, several machines are mentioned and their capacity given as follows :

"That of Huret Lagache, it is said, can produce 400 lbs. of filament daily, and the stems yield from 20 to 30, and even (according to Favier) 34 per cent. of their weight, but they must be perfectly dry, an impossibility in the open air in Europe, where drying by artificial means and consequently extra expense is necessary. The machines of Laberie and Roland are also made to clean the dry stems. The latter, says Goncet de Mas, turns out of his manufactory three machines. The No. 1, moved by one man and costing about £60, will give 120 to 140 lbs. of clean fibre per day. No. 2, costing £88, will, with one horse, give from 300 to 320 lbs., and the No. 3, with the force of one horse-power (steam) and costing £120, will clean from 400 to 500 lbs."

Dr. Philippo also mentions the machine and process of Moerman Lambuhr of Antwerp, who has three machines, one for crushing the stems after they had been retted and dried, No. 2 for scraping and breaking up the wood, and a third for finishing and cleaning the

fibre. The prices of his machines come up to over £300. He claims that his machines will clean from 4 cwt. to 8 cwt. of fibre per day, worth from 1s. 6d. to 3s. per lb. He states that an acre of Ramie can thus be made to return from £100 to £200 per annum. Another machine invented and sold by the Sanford Manufacturing Company of New York is mentioned as capable of producing 140 to 250 lbs. of clean fibre per working day of ten hours

I may mention another machine manufactured in France, the capacity of which is claimed to be from 250 to 300 lbs. per day. The price of this machine is £180, to be paid for before leaving the factory, and £12 royalty per annum, to be paid in advance. At a recent trial [of a newly invented machine at New Orleans] at which were present as witnesses more than 30 merchants, capitalists and mechanical experts, the machine's capacity was proved to be 1,800 lbs. of fibre in 10 hours, and a certificate was signed by those present to that effect.

I may state that the cost of building [this] machine does not exceed £100, but the inventor purposes working his machine on a royalty on fibre decorticated.

* * * * *

All that now remains is to show that Ramie can be grown successfully and with a large profit to the planter in Jamaica. I will therefore give the actual results of Ramie cultivation in Louisiana, where, be it remembered, the plant only matures twice annually, and only grows from 5 to 6 feet in height, while in Jamaica it matures four times annually and grows much higher than in Louisiana. We turn therefore to consider the agricultural problems.

Two crops of Ramie are obtained in Louisiana per year. There is an average yield per annum of 2,000 lbs. of dry ribbon per acre. This of course is good cultivation. The inventor of the machine and process alluded to has a patch in Louisiana nearly four years old, and the following has been the cost of cultivation and average yield per acre:

COST OF CULTIVATION.

Ploughing.....	\$ 1 50
Weeding (first year) second year, 25 cents.....	1 00
Fertilizing.....	10 00
Stripping leaves from stalk by hand.....	8 00
Cutting and hauling.....	4 00
Decortication.....	10 00
Fuel (in addition to burning the hurds).....	2 00
Baling.....	2 50
	<u>\$39 50</u>

AVERAGE YIELD PER ACRE.

First year.....	1,198 lbs. dry ribbon.
Second year.....	2,130 " "
Third year.....	2,200 " "
	<u>5,528</u>

At 7 cents per lb.....	\$386 96
Less cost of production as above.....	\$117 00
Freight, commission and insurance.....	19 35
	<u>136 35</u>
Showing net profit per acre.....	\$250 61
Showing an annual net profit per acre.....	83 53

The United States agricultural reports give an account of Roetze's experiments in cultivating Ramie at the Botanical Gardens in Jamaica in 1854, where he demonstrated under high cultivation that 1,200 lbs. of ribbon could be produced per acre at a single cutting, which ribbon, under an experiment, thoroughly degummed, yielded 34 lbs. to the 100 lbs.; when bleached, 31 62-100 per 100 lbs.

I may also state that Ramie was introduced into Louisiana from, I believe, Jamaica.

My personal experience of the cultivation of Ramie does not extend to Jamaica, but is rather confined to the Southern States of America and Louisiana particularly. When, however, we come to consider the large profits that, even in Louisiana, I have shown to be obtainable from the cultivation of Ramie, and the known superiority of your soil and climate over those of Louisiana, and taking into con-

sideration the fact that the cost of labor in Jamaica is much less than in Louisiana, I do not hesitate to say without fear of contradiction that the cultivation of Ramie in Jamaica will be far more profitable than I have demonstrated it to be in Louisiana.

So far as practical instructions on the subject of the best way to cultivate Ramie in Jamaica are concerned, I must leave you in the able hands of the Botanical Department of this island, from which source Louisiana has derived much experience and advice in the cultivation of Ramie.

In his lecture already referred to, Dr. Phillippo said: "Ere long, Ramie will prove as strong as the cotton interest, awaiting only the arrival of a Whitney to fully develop it by improved and simple machinery, and thus render it as important a factor for the advancement of the countries that adopt it, as that textile has been for the Southern States of America."

IV.

CACAO, BANANAS AND INDIA RUBBER IN COLOMBIA.

A report to the British Foreign Office, submitted to Parliament March, 1894, supplies some valuable information as to the possibilities of the cultivation of Cacao (from which chocolate is produced), Bananas and India Rubber trees in districts adjacent to the Sierra Nevada of Santa Marta in Colombia. The report is as follows:

MR. JENNER TO THE EARL OF ROSEBERY.

BOGOTA, December 26, 1893.

MY LORD:

I have the honor to enclose herewith two very interesting reports that have been kindly given me for publication, if it be thought desirable, by Mr. Thomson, who was formerly Superintendent of the Jamaica Botanical Gardens. That gentleman, commissioned by the Minister of Public Works privately, was lately engaged in studying the agricultural capabilities of the districts surrounding the Sierra Nevada of Santa Marta, and the reports in

question are the result of his investigations. The first report deals chiefly with the cultivation of the wild species of cacao in conjunction with bananas, whilst the second is concerned with the substitution of various species of the indigenous india rubber tree for the valueless trees at present used to shade the cacao plant. It also points out the advantages to be derived from the combined cultivation of cacao, bananas, and india rubber. Moreover, in Mr. Thomson's opinion, there are many slopes of the Sierra Nevada on which coffee could profitably be cultivated on a large scale.

In view of the liberal laws concerning unoccupied lauds, it is probable that a company with a moderate capital could find advantageous investments in the district dealt with by Mr. Thomson, where in many places, side by side with the culture already enumerated, cattle could profitably be bred for exportation to the West Indian Islands.

The climate in the cacao-growing districts is undoubtedly not suitable for northern European labor, but there is nothing in the Immigration Laws to prevent a company from introducing southern European or negro labor. On the slopes of the mountains, where the coffee plant flourishes, the climate is healthy, and plantations might be so selected as to enable the European superintendents to build their houses above the sultry plains in an agreeable and healthy atmosphere.

The Central Government are most anxious to afford every facility for the introduction of the labor and capital needed to develop the great agricultural wealth of the districts within reach of the northern coasts. Unfortunately Congress, engaged in political discussions, could find no time to consider two Bills brought before it for the purpose last year. One of those Bills would have authorized the introduction of Chinese coolies, whilst the other was to sanction a contract for the establishment in the country of 10,000 Italian immigrants. These two Bills will, I am told, again be laid before Congress in the session that opens in July next.

It will be observed that Mr. Thomson concludes his second report by the statement that "the wealth of the Sierra Nevada region throws into the shade all the Antilles."

I have, &c.,

(Signed)

G. JENNER.

Report on an Excursion to the Sierra Nevada de Santa Marta to Investigate the Cultural Capabilities of the District.

Proceeding from the seaport town of Rio Hacha to the village of Dibulla along and in close proximity to the beach, the vegetation consists to a large extent of cacti and dwarf thorny leguminous trees, which latter at the end of the dry season are mostly devoid of foliage. The direction to Dibulla is almost due west, and the distance about thirty miles. From Rio Hacha a large plain extends some thirty

miles towards the eastern extremity of the Sierra Nevada. The western extension of this plain, bounded by the Caribbean Sea and the Sierra Nevada, gradually diminishes in width to some five miles as it approaches Dibulla, and this contraction of the plain coincides with the rapid ascent of this system of mountains, that is, from a few hundred feet at its eastern limits to the magnificent summits near Dibulla covered with perpetual snow. Still farther westward this narrow plain extends, with the exception of several transverse ridges, about forty miles towards Santa Marta, where the ramifications of steep mountains project into the sea.

The broad Rio Hacha plain, excepting on the lands within a few miles of the mountains, is a comparatively arid region, having a scrubby parched vegetation. Throughout this plain, it may be mentioned, 4,000 tons of *divi-divi* are collected annually for export, besides as much more left on the ground to rot. On this plain another plant grows wild in great profusion (many millions), viz., *henequen* ("agave rigida").

From Dibulla on the seaside to the base of the Cordillera the plain ascends to about 150 to 300 feet. It is covered with forest, as are the slopes of the mountains up to 8,000 and 10,000 feet, the exception being some considerable clearings between 3,000 and 8,000 feet in the Arauja Indian district. In close proximity to the sea the soil is largely composed of sand, but on receding a mile therefrom a deep loamy soil on a flat swampy belt affords a congenial site for a magnificent forest of palms—an impressive scene of tropical luxuriance. From these palms to the foot of the hills the forest consists chiefly of huge exogenous trees growing somewhat widely apart for a tropical forest, together with an exceptionally thick undergrowth. Many rivers and innumerable quebradas (ravines) connected therewith cross the plain. Here, too, the soil, over which a blue limestone abounds, is extremely rich and fertile. It was here, about two miles from the base of the hills, that I first observed the cacao tree.

The important fact with regard to these trees is that they are of spontaneous growth, and therefore wild cacao, the original Theo-

broma cacao. Still nearer the hills I found the tree dispersed on all sides.

At another point, some half-a-dozen miles to the westward, while crossing the plain in the direction of the highest summits of the Sierra Nevada, this wild cacao I found to be a predominating, or characteristic, species of the forest undergrowth. Here I traversed a zone of cacao not less than eight miles wide, thus distributed on the plain as well as on the lower slopes of the numerous spurs of the mountains ranging from 300 to 1,300 feet above the level of the sea.

At Don Diego and still further to the west, a distance of about forty miles from Dibulla, cacao is found in the forest under precisely the same conditions as those described. And I am assured that all along the base of the Cordillera to Trienta, where the eastern extension of the Sierra Nevada disappears, cacao equally abounds. Thus a continuous distribution from beyond Don Diego to Trienta of about one hundred miles. This great cacao zone is entirely uninhabited, and the lands, though obtainable for a few reals* per hectare, "terras baldias" (unoccupied lands), are unsought for, their value being wholly unknown. Moreover, the existence of wild cacao seems to have escaped attention.

Under the dense shade of the great forest trees, eighty feet high, with trunks five and six feet in diameter, the cacao presents an aspect totally unlike its cultivated congener. The matured cacao trees attain a height of from thirty-five to forty-five feet, with slender trunks devoid of branches to within a few feet of the top; and these trunks are as straight as those of a palm tree. All the mazorcas (pods), with few exceptions, are borne among the sparsely foliaged branches at the summit. Besides the full-grown trees, others exist in all stages of growth, hundreds being scattered over a hectare of land. The excessive shade has imparted a weird and ill-proportioned appearance to these trees, many of which, drawn up towards the gleams of light, are not thicker than a walking stick, though twenty feet high. Not only have these cacao trees to struggle under the

*At the present exchange a real is worth about 2*d*.

unpropitious shade of gigantic trees, they have also to contend with numerous minor rivals—an aggregation of species which constitute a tropical undergrowth.

The productive capacity of these trees is very variable; some, more favorably situated, yield as much as 10 and 12 lbs. of cured cacao, but the great majority yield insignificant returns. It is to be regretted that trees with good crops of fruit are very frequently cut down, this being the easiest means for securing the crop.

Among the cacao trees there is no variation whatever in the general form and size of the fruit. The predominating color is yellow, though mazorcas (pods) of a reddish hue are not uncommon. It is interesting to note that the seeds on section are perfectly white. All are undoubtedly one true specific type, a fact of great interest to cacao planters, for apart from the advantages of identity in the process of fermentation, new varieties must eventually evolve either by variation or by cross-fertilization.

Several attempts have been made to bring these wild trees to a state of cultivation. I understand that the first efforts in this direction originated at La Loma many years ago. This attempted cultivation has been confined to the removal of the thick undergrowth which surrounds the cacao tree, and afterwards, at intervals of a year or more, cutting down the weeds that spring up. The result of these operations, though effecting some improvement in the production of fruit, cannot be considered satisfactory, for the great obstacle to the development of the plant, namely, excessive shade, remains intact. However, by the operations in question, some relief has supervened; but the advantage gained is immaterial when it is remembered that 10,000 full-grown trees yield only 1,200 lbs. of cacao per annum. Though some of these trees yield excellent results, the great majority of them are practically non-productive.

At a distance of about two miles from La Loma an industrious Frenchman has taken up the reclamation of the wild cacao on the lines adopted on that property. He has during two years cleared the undergrowth over more than 100 hectares, leaving the large forest trees; thus the cacao trees, which formed a part of this under-

growth, have been carefully preserved; and, moreover, one or two experiments are being initiated, such as supplying vacancies where the wild cacao plants were wanting, and topping trees of moderate size in order to induce them to branch at a convenient height. Notwithstanding these trials, it seems impossible to conceive trees which have emerged from the conditions of forest life accommodating themselves to the changed habits requisite to bring them into a state of remunerative productiveness as is the case with systematically cultivated cacao, for cultivated trees from the outset are made to flourish. Having been particularly requested to give my opinion as to the prospects of this enterprise, my reply was not encouraging. I, however, suggested, as a remedial measure, the destruction of some of the large forest trees at given intervals so as to command more light. With a more abundant admission of light, no doubt some benefit would accrue, but the advantages attendant upon the establishment of scientifically-formed plantations would far outweigh that derived from such partial improvements.

It is well known that cacao under cultivation is a shade-loving plant. Nevertheless, in many instances, protection from the sun is not absolutely necessary. A medium well-regulated shade is what the cacao planter should carefully establish. In Trinidad, whence more than 20,000,000 pounds of cacao are exported annually, two species of the genus "erythrina" are employed for this purpose. These are planted widely apart among the cacao trees, and answer the purpose well.

In addition to the attempts at cultivation already referred to, similar trials are being made on a considerable scale at Don Diego, and by another party elsewhere.

The form of the pod, besides being smaller, is quite distinct from the more elongated types of criollo and foresters, the most prized varieties under cultivation in Trinidad and Venezuela.

Though the pods in the wild type are considerably smaller than those of the best cultivated forms, it is noteworthy that in the former the seeds are larger and the pods more economically filled; thus ten and eleven pods yield one pound of cured cacao. This result

will be best exemplified by the following comparison with Trinidad cacao.

According to a treatise on cacao cultivation and curing recently issued by the Botanical Department of Trinidad, the entire contents (seeds, pulp, &c.) within the forest pod as cultivated in that island, when weighed, amount to just about four ounces, and "the pulp surrounding the seed, with the placenta, weighs nearly the same as the cleaned kernel." Thus in the Trinidad pod the seeds weighed two ounces, whereas the wild cacao seeds, similarly divested of the extraneous matter, weighed three ounces, the waste matter surrounding the seeds being considerably less than that appertaining to the Trinidad seeds.

We have, then, in the wild cacao not only smaller pods, but also an enhanced productive capacity. Besides, the superfluous pulp in the cultivated varieties is a source of inconvenience to the planter. "The pulp cannot be removed by washing before fermentation, and even after the decomposition caused by fermentation it is somewhat hard to remove." Under the favorable circumstances referred to, namely, smaller pods, and these more economically filled, consequent on the diminution of the waste matter, the wild plant, not only on practical grounds, but also on physiological principles, is capable of yielding larger crops than are obtained from the varieties in cultivation. Hence the importance of the propagation and establishment of plantations of this the original type.

In Trinidad and other cacao-growing countries great importance is attached to fermentation, as this operation imparts the requisite colour and consistence to the article. On the other hand, the method of curing the insignificant crops gathered on the plains of the Sierra Nevada is primitive in the extreme. Sometimes the pods unopened are simply put to dry in the shade until the seeds become fit for use, sometimes the seeds are wrapped in large leaves for a week and then dried in the sun, and sometimes the seeds when extracted from the mazorcas are placed in a barrel for three days and then dried, the barrel containing the cacao being placed under a roof without side-walls. Compare these simple

operations with the elaborate processes at work in Trinidad, where special houses and compartments are deemed necessary. Here is a brief quotation from the "First Prize Essay" on cacao fermentation in Trinidad (Government award):—"This sweating (fermenting) must not be regarded either as a simple process; on the contrary, it includes more or less the secondary fermentations, such as lactous, butyric, mucous, and putrefactive or cremacausis." Notwithstanding these elaborate preparations the wild cacao, as has been demonstrated by frequent exports of several quintals, holds its ground, for it was classed in the Paris market with the best Caracas brands.

Trinidad holds the first position among British colonies with regard to cacao production. But recently Ceylon has stolen a march upon the West Indian colony by the realization of far higher prices, brought about partly by excessive washing, and consequently thorough removal of the pulp, a method, however, that reduces considerably the weight of the produce, and partly by propagating exclusively from one or two well-defined forms. Anyhow, a difference of thirty per cent. in favor of the Ceylon produced is a remarkable event. Of course the Trinidad planter is not insensible to this achievement on the part of his colonial brother in the East; hence strenuous efforts are being made to improve the quality of this the greatest industry of the island. Lands for cacao cultivation in Ceylon are not available to any great extent. But it is no exaggeration to say that if the lands occupied by the wild cacao at the Sierra Nevada were obtainable in that colony such lands would be bought up at once for more than 100 dollars (paper) per hectare.*

The treatise on cacao above referred to says of Trinidad:—"If land can be found on the banks of a stream or river where there is considerable depth of alluvial deposit, such a position, if capable of being well drained, is a sure source of wealth to the cacao planter." This is tantamount to saying that such ideal sites do not abound. How infinitely superior are the innumerable sites for plantations at the foot of the Sierra Nevada, sites which nature has disclosed.

*About £8 at the present exchange.

In two reports of mine, published by the Colombian Government, I strongly advocated the introduction of cacao seeds from Trinidad with the view of ameliorating the degenerated plantations of the interior. The result of my excursion to the Sierra Nevada, as reviewed in this report, completely nullifies my former impressions as to the advisability of importing these seeds; now the conditions are reversed, the wild cacao being "par excellence" the kind for cultivation throughout the Republic.

In those countries in which this product has become a staple the yield per tree hardly averages $1\frac{1}{2}$ lbs. With our wild cacao I feel sure that under careful cultivation that average can be doubled, though in making an estimate of returns I prefer to curtail this prospective average. The cacao planters of Tolima, where millions of pounds are cropped, annually obtain an average of little more than $\frac{1}{2}$ lb. per tree. Hence, the replanting of the degenerated fields of the interior, as well as the extension of this cultivation, with seeds from the Sierra Nevada, is a measure the importance of which cannot be overrated. Arrangements could be made for the acquisition of these precious seeds on a large scale. On this point I may add that, on my recommendation, a gentleman who is planting cacao largely among his highly cultivated banana plantations near Santa Marta has already taken steps to obtain a supply of seeds of the wild type.

During my sojourn on the Sierra Nevada I visited a roza (cultivated field), on which a few trees of the wild type were under cultivation. These are old trees, growing at the considerable altitude of 3,100 feet above the sea, and they are fully exposed to the sun. The owner assured me that he frequently obtains a crop of 12 lbs. cured cacao from a tree. Unlike their congeners in the forest, the cultivated plants are well furnished with branches from the lower part of the trunks.

The cacao planter at the coast directs his attention exclusively to the production of this commodity for export, whilst the cacao planter of Tolima and other interior provinces finds a ready market on the spot, in consequence of the large domestic consumption. The latter planter, indeed, commands an abnormally high price, owing to the

supply not adequately meeting the demand; thus, prices actually rule higher than in Europe. The planter at the coast, however, possesses the great advantage of cheap transport to the markets of Europe, an advantage equivalent to some 3 pesos (about 5s.) per arroba (25 lbs.)

From the foregoing observations it will be seen that my convictions are in no way favorable to the irregular and ungenial attempts at cultivation being pursued with the wild cacao in the forest. No doubt some improvement could be effected by cutting down large forest trees at given intervals, but even in this case I cannot anticipate results at all comparable to those obtainable from well-devised practical methods involving the clearance of the entire forest so as to form new plantations, and this, too, not with the natural seedlings of the forest, but with specially propagated plants obtained from the wild stock.

The latitude of this wild cacao zone is just over 11 degrees. Consequently the following extract from "Humboldt's Personal Narrative of Travels" is peculiarly interesting: "The tree which produces the cacao is not at present found wild in the forests of Terra Firma to the north of the Orinoco; we began to find it only beyond the cataracts of Atire and Maypire. It abounds particularly near the banks of the Ventuari, and on the Upper Orinoco between the Padoma and the Gehette. This scarcity (absence?) of wild cacao trees in South America, north of the latitude of six degrees, is a very curious phenomenon of botanical geography and yet little known. This phenomenon appears the more surprising as, according to the annual produce of the harvest, the number of trees in full bearing in the cacao plantations of Caracas, Nueva Barcelona, Venezuela, Varinas and Maracaibo is estimated at more than 16,000,000. The wild cacao tree has many branches, and is covered with a tufted and dark foliage. It bears a very small fruit, like that variety which the ancient Mexicans called 'thalcacahuatl.' Transplanted into the Conucos of the Indians of Cassiquiare and the Rio Negro, the wild tree preserves for several generations that force of vegetable life which makes it bear fruit in the fourth year."

The question of selecting a tree to afford shade to the cacao plantations is extremely important. As we have seen, a useless tree is planted for this purpose in Trinidad and elsewhere. In the earlier stages of the plantations maize, bananas, etc., suffice for shade. Later on, a tree of rapid growth with a semi-umbrageous habit is required. In Colombia there are various species of indigenous caucho (rubber) which merit the attention of cacao planters. I understand that a valuable species easily propagated grows on the banks of the Rio Sinu. This, as well as other kinds of caucho, should be tried. Zarrapia ("dipterix odorata"), indigenous in the llanos, is another tree worthy of attention. The establishment of economic shade trees, destined to yield important subsidiary crops, is a matter of the utmost consequence to the progressive development of the cacao enterprise in this country. I may here mention that I called the attention of several of the gentlemen engaged in banana and cacao cultivation near Santa Marta to the utility of substituting such shade for the ill-adapted trees they have chosen, one of which being "Pithecolobium saman."

Reference has been made to the cultivation of cacao in conjunction or intermixed with the banana. This latter has now become an established industry at Rio Frio, where the plantations are being constantly extended with commendable enthusiasm. Though the industry is in its initial stage, a steamship is despatched fortnightly from Santa Marta with a full cargo comprising from 13,000 to 15,000 bunches. The plantations present a most luxuriant aspect, the result of admirable cultivation—a cultivation in which irrigation plays an important part. Throughout hundreds of hectares of these plantations cacao has been planted contemporaneously with the banana. The overpowering growth of the latter, however, has checked to some extent its less exuberant companion, which has consequently suffered. Besides, in the hurry of cropping the banana, cutting them down, etc., the cacao is often injured. The progress made by much of this cacao in the course of four years is hardly greater than should be obtained in two years were the plant grown under congenial circumstances. As a means of alleviating the cacao I have made the

suggestion to establish the plants in nurseries, there to be transplanted several times until they become vigorous and several feet high, at which stage they can be safely transferred to the plantation; also for the general welfare of the cacao I recommend that the bananas be set at greater distances apart so as to ensure more adequate light and free circulation of air.

It will thus be seen that the establishment of the two products conjointly presents some difficulties. Both are planted equidistantly. At Rio Frio a modification of the present system would no doubt prove a preventive to the injury sustained by the young cacao trees. At the same time it must not be assumed that cacao will flourish with its wonted vigor when cultivated conjointly with a plant that is in some degree antagonistic; in other words, the cacao is suppressed in the shadow of a stately mass of great banana leaves. On this account, probably the cultivation of the banana among cacao should be limited to three years.

Report on the Cultural Capabilities of the Sierra Nevada of Santa Marta.

With reference to my visit to the Sierra Nevada of Santa Marta in the month of May last, I now furnish another report on its cultural capabilities, especially with regard to the banana and caucho (rubber) cultivation on the plains, and coffee on the hills.

Barranco.—This large property, the cultural resources of which indicate those of the entire plain, is situated midway between Rio Hacha and Dibulla. It extends from the sea, by which it is bounded, towards the foot of the Cordillera. The Rio Enea forms the western boundary along about nine miles of its course. This river is navigable for small craft throughout the year. The area of the property amounts to 18,092 fanegados—more than 26,000 acres. For general cultural purposes the best lands on this property are located several miles distant from the sea, where many thousands of acres are well adapted for cacao, banana, rubber and other valuable products.

In proximity to the sea, the characteristic feature of the Barranco lands answers the description conveyed in my letter of June 26:—

"The Rio Hacha plain, with the exception of the lands within a few miles of the mountains, is a comparatively arid region, having a scrubby parched vegetation."

The cultivation of bananas on a commercial scale is a new industry in Colombia. Costa Rica and Jamaica are the principal sources whence the United States is supplied with this fruit. In Jamaica it is now the most important article of export, having in recent years outstripped the former great staple industry—sugar. In 1889-90 the value of the bananas exported from that island was £446,974, the number of bunches being 4,729,037. In the following year, 1890-91, the value increased to £638,974, the area under cultivation amounting to 9,097 acres. Now that this industry has been fairly inaugurated in Colombia, the rich soil on the plains of the Sierra Nevada may well vie with Jamaica: indeed, judging from the large extent of cultivation already established in Rio Frio, this new enterprise claims a position amongst competitors. At Rio Frio irrigation is resorted to, the locality being subject to prolonged droughts, but the influence of irrigation is abundantly demonstrated by the remarkably luxuriant aspect of the plantations, and the splendid crops of fruit. Already some 13,000 bunches are being exported fortnightly, and this number will be greatly increased shortly.

As to the fertile lands of the inland portions of Barranco, no more eligible region for the cultivation of bananas is conceivable. Here, near the base of the mountains covered with forest, the climate is humid, consequently irrigation is unnecessary. In the event, however, of exceptional droughts, the fine Rio Enea can be turned to account with the utmost facility. It is essentially requisite that a sufficient area be planted with bananas so as to maintain a steamship service fortnightly, as is the case at Santa Marta, for it is found that crops of this fruit are fit for cutting every fortnight, and if not accordingly cut, great loss ensues. A steamer carries from 13,000 to 20,000 bunches. To maintain a fortnightly service some 300 hectares of bananas would have to be established. This extent of cultivation (750 acres) represents one-twelfth of the total area under cultivation in Jamaica, and correspondingly, one-twelfth of the value of the

Jamaica crop, viz: £53,248. This latter sum is, therefore, the value of the banana crop obtainable from 300 hectares, £177 per hectare, in that island. This estimate of returns may safely be taken as a criterion for the productive capacity of the Barranco lands.

At Rio Frio the estimate for preparing the land and cultivation, including irrigation, until the plant becomes productive at about the end of a year, is from 150 pesos to 200 pesos* per hectare.

In my previous report I referred to the cultivation of rubber as a shade tree for cacao in lieu of the useless tree everywhere employed for this purpose. Under this system of cultivation the rubber is distinctly a subsidiary product, cacao being the primary object. For the purpose of affording shade the rubber trees are set widely asunder, some twenty to the acre, thus on a cacao plantation of, say, 302 hectares (750 acres), 15,000 rubber trees.

The importance of rubber cultivation is universally admitted. I will therefore propound a scheme for its cultivation on a principle that will ensure the production of rubber under the most advantageous circumstances. My proposal is to form systematically planted rubber and banana plantations, both to occupy the same land, and to be duly interplanted in accordance with the requirements of the respective plants. No difficulty stands in the way of carrying out this dual cultivation, neither plant possessing any predominant influence injurious to the other, at any rate during the first five years, after which smaller crops amounting to from 10 per cent. to 20 per cent. may be placed against the bananas.

The rubber tree is set much wider apart than cacao is among bananas, and after three years' cultivation it will have attained a height exceeding the bananas.

The two plants may be cultivated in companionship for some ten years until the rubber begins to yield crops. We have thus a great plantation of rubber resulting from banana cultivation, a plantation ready to yield a precious commercial substance just at the time when the banana may be said to have run its full course of productiveness. With the different important species which it is advisable to establish,

* £12 to £16 at present exchange.

an average of about 90 trees per acre will result; consequently, a plantation having an area of 300 hectares would contain 67,500 trees.

Between the tenth and twelfth years the rubber trees would yield returns sufficient to cover the then current cost of their cultivation.

Between the twelfth and twentieth years each tree would yield at least two pounds* per tree annually. Subsequently, and for more than half a century, it is quite safe to estimate the returns at double the foregoing, that is, four pounds per tree. From 67,500 trees, or better to say 60,000—allowing for unsatisfactory specimens—two pounds per tree would be harvested annually, or four pounds bi-annually. From the twelfth to the twentieth years, therefore, we have an annual crop from 60,000 trees of not less than 120,000 pounds, which at two shillings per pound, or four shillings per tree yearly, amounts to £12,000. Deduct from this for working expenses say, £3,000. Hence a net profit of £9,000 per year. From the twentieth year onwards, £24,000 per year would be realized from the crops, less for working expenses, etc., £6,000, thus a net profit of £18,000 per year.

It is to be hoped that this highly important product will be taken up on a very much larger scale than is here indicated, viz.: 120,000 pounds per year. By way of illustration I would mention that in Ceylon there are several tea plantations each of which produces more than 500,000 pounds of tea per year. And dozens of plantations aggregate more than 200,000 pounds each. Some of these plantations have more than 1,000 acres each in tea, and as much more in other cultures.

Forty years ago the consumption of rubber was quite insignificant; now the United States and England each import about 15,000 tons, valued at more than \$30,000,000.

Brazil, the greatest of rubber-producing countries, has not yet inaugurated systematic planting. In the more accessible and inhabited districts some commendable efforts are being made to conserve the tree after it is tapped, but beyond these accessible limits the

*Mr. Morris, the Assistant Director of Kew Gardens, says the *Castilloa* trees at ten years old yield four pounds to seven pounds of rubber.

irregular distribution of the plant, together with its remoteness, precludes the possibility of the general adoption of this conservation; from which system, moreover, only small crops are obtained after the first general extraction. Hence the necessity of resorting to systematic cultivation.

The enterprising planters of Ceylon have been the pioneer cultivators of rubber. Difficulties and disappointments have been experienced, for everything had to be found out by experiments. It may be noted, for instance, that some of these shrewd planters even went the length of growing and commending the cultivation of the Ceará rubber tree as a shade for cacao, the climatic conditions requisite for each plant being absolutely dissimilar. Two years ago the area of all the species of rubber under cultivation in that colony was 454 acres.

According to report, rubber cultivation has been successfully initiated in Mexico, where the species experimented upon becomes productive in five or six years.

The Government of India has authorized the establishment of plantations of the species indigenous there, viz., *Ficus elastica*.

Colombia has likewise made a beginning with a valuable indigenous species planted near Chaparral at a height of about 6,000 feet above the sea; and it grows with remarkable rapidity.

The following extracts relative to rubber and its cultivation are culled from the most reliable sources:—

The Pará Rubber.—Dr. Zimen, the distinguished Director of the Ceylon Botanic Garden, in his report for 1890 says: "That the yield of rubber is improving as our trees get older, is evidenced by a further experiment made at Heneratgoda during the past year by the conductor. The tree selected was the same one as was tapped in 1888, the results of which were recorded in my report for that year. This is now thirteen years old, and its stem girths four feet eleven inches at a yard above ground. It was tapped on seventeen days: on seven days in January and February, on six days in July and August and on four days in November and December. The method followed was to smooth the surface by scraping off a little of the

outer bark to a height easily reached, and then to make with a three-quarter-inch chisel, numerous V-shaped incisions. At the foot of the trunk cocoa-nut cups were fastened with clay, and the milk conducted into them by little ridges of clay. Most of the milk, however, dried on the tree in tears. The tapping was done in the afternoon and the rubber collected in the morning. From the tree (which yielded nearly two pounds in 1888), we obtained this year two pounds ten ounces of good dry rubber, partly in sheet, but mostly in tears. The tree appears none the worse for the operation, and I consider the result very encouraging. The whole cost of collection was under a rupee, and of course on operating on a large number of trees in a plantation this would be very greatly reduced."

Mr. Clements Markham, well known for his services in connection with cinchona introduction into India, etc., writing on the subject of the *Castilloa* rubber, a valuable species indigenous to Colombia and Central America, a species the Government of India had determined to introduce to that country, says: "Mr. R. Cross left England on May 2, 1875, and reached Panama on the 26th of the same month, my instructions to him being to make the collection on the isthmus He ascended the Chagres river in a canoe, and then made a journey on foot through the dense forest into the heart of the Ule district. He found the *Castilloa* saplings growing on the banks of streams with their roots often running down to the edge of the water. They abound in rich soil along the base of the hills, and are often met with on the summits of ridges; everywhere except in swampy ground. The trees, which proved to be the species named by Mr. Collins, *Castilloa* Markhamiana, are from 160 feet to 180 feet high, with a diameter of five feet, and a yield of 100 pounds of dry rubber."

The same writer in continuation of his observations relative to the valuable species of rubber, refers to the Ceará rubber (*Manihot Glaziovii*), plants of which Mr. Cross also procured for India. The following extract refers to the climatic and other conditions in which the plant grows: "South of the Amazonian forest there is a region known as Sartao or wilderness, extending in a broad belt from the

Parnahyba river to the Sao Francisco. The province of Ceará is within this belt, a high rolling plain, broken by abrupt elevations and chains which are, in fact, outlying fragments of the great central tableland of Brazil. The only high forest is found on these mountain sides, the summits and the plains below being occupied either by their forest growth, or by pastures and sandy tracts, with groves about the river courses. From June to December the climate is exceedingly dry, and the streams and rivers disappear except along the mountain sides." Mr. Cross himself in a letter to the Under Secretary of State for India, says: "The Ceará tree is not delicate, and will grow and produce rubber in situations where other kinds of plants would be dried up. For these reasons, it is likely to prove a valuable plant in India in parched up regions and stony unproductive lands thinly covered with soil." Again, "Neither grass nor weeds grow under the trees."

As previously mentioned in these reports, extensive tracts of this large plain (including Barranco) are distinguished by a scrubby parched vegetation. This is exactly the condition applicable to the requirements of the Ceará rubber tree, and it would be impossible to secure a more eligible district. In this connection I may mention that I have had opportunities of practically knowing the habits of this species, having many years ago introduced a few plants of it to Jamaica, where I grew it in both humid and arid localities. I also introduced it to Colombia and planted it at Chaparral, in the wet soil and climate of which it perished. I may further mention that I introduced the Parà and the Castilloa rubber trees to Jamaica; now these are but denizens of the Botanic Garden.

The important point as regards this district is, that the "parched scrubby vegetation" covers the country so scantily that the Ceará rubber can be planted without the necessity of clearing the existing growth, that is to say, the seeds of this tree have merely to be set in the ground among the scrubs without any other preparation than sometimes chopping down with a cutlass a bush or two that may be in the way of sowing the seed. In this way the cost of planting an acre (200 to the acre) need not exceed two dollars. The seeds ger-

minate under certain conditions immediately, and spring up with wonderful rapidity, that is, in the course of a year they grow six feet to ten feet. And for their subsequent cultivation two dollars per acre per annum—a liberal allowance—would suffice. A thousand acres would contain 200,000 plants, and after ten or twelve years one pound of rubber per tree would be harvested annually, or, say only 150,000 pounds, a return that would be greatly enhanced later on. The quality of this rubber may be judged from the following: "An authoritative report received from Messrs. Lewis & Peat valued a sample consignment of Ceylon Ceará at from two shillings nine pence to two shillings ten pence per pound." Again, "One sample parcel of Ceará rubber has, as previously mentioned, realized four shillings per pound."

At one shilling six pence per pound (a moderate price) the returns in the twelfth year from the sale of 150,000 pounds of rubber would be £11,250. Deduct from this amount for harvesting and transport expenses, £3,250; thus £8,000, less for planting and up-keep during twelve years, at £6 per acre (1,000 acres), £6,000. From the twelfth year onwards the annual value or profit from the crop will be, after deducting £3,250 for working expenses, £8,000.

The three species of rubber I have referred to, comprise the most valuable commercial kinds of tropical America, and America stands pre-eminent in all that relates to rubber. The other best known kinds are *Ficus elastica* of India, and the *Landolphias* of Africa, species of secondary importance. Colombia possesses in the remote regions bounding the head waters of the Amazon and the Orinoco valuable, and at present scientifically unknown, species of rubber. In the territory of Caquetá, for instance, a highly valuable kind abounds. Hundreds of arrobas of this have been extracted from the locality, and this notwithstanding the extraordinary difficulty of transport. The high prices obtained for this rubber in New York sufficiently determine its quality. From what I have ascertained it is in all probability the produce of *Hevea*, the Pará rubber genus. There is another important rubber tree found in large quantities on the llanos of San Martín. This sort is being exported to a considerable extent,

roads or tracts having been made through the forest to facilitate its transport; this may be another species of *Hevea*, but from the description I have had of it it is probably not identical with the *Pará* species. Writing to the Secretary of State for India, a gentleman who has penetrated to the head waters of the Orinoco, says: "I found it (*Hevea*) very abundant high up on the Orinoco above the junction of the *Guiavare*." This points to the *Hevea* being indigenous to Colombia. Another species is found on the banks of the *Río Sinu*; this is probably the *Castilloa*. Seeds of all these kinds can no doubt be obtained in abundance. These brief allusions to the rubber species of Colombia, and there is another important kind that grows on the high mountains, point in a manner not to be mistaken to the unequalled, or, at least, unsurpassed resources of this country for rubber cultivation. In this connection it may not be amiss to add that it behooves tropical America to repel the following prediction of an eminent writer on tropical agriculture: "Indeed, there is every probability that in the long run, as with *cinchona* so with *caoutchouc*, it is upon systematic plantations in the Old World that we shall have to depend for our supply." This writer does not venture to reclaim coffee, which is a triumph of the New World. But even in the case of *cinchona* barks the Old World cannot grow them like the New; for those cultivated in Colombia are the richest in the world, notwithstanding that one of the species thus distinguished has actually been grown from poor East India seed. As to rubber, no doubt the best quality will continuously come from tropical America.

There is one acknowledged difficulty that stands in the way of rubber cultivation. I refer to the long lapse of years before the crops are assured. From the point of view of a tropical planter, 10 or 12 years to await for returns involves hesitation. On secondary thoughts this should be no real difficulty. Be this as it may, I have in this report planned a method calculated to overcome this objection, that is to say, the intervention of banana cultivation.

It has been shown that in the midst of a large banana plantation another great plantation can be simultaneously established, a planta-

tion comprising various species of rubber, and this is practically exclusive of cost after their propagation. Also intimately associated with this latter undertaking, another great plantation of rubber (Ceará) can be created on adjacent waste lands at a minimum cost. Thus rubber plantations, respectively consisting of 67,500 and 200,000 trees, both of which are estimated to produce when 12 years old rubber valued at £17,000 a year. And 8 years later £26,000. These estimates have been arrived at after careful consideration, always keeping in mind moderate estimates.

As these rubber plantations are to spring from the banana enterprise, the first step to be taken is to inaugurate this latter cultivation. Three hundred hectares being a large area, at least two years would be necessary for clearing and planting same. In these operations \$200 per hectare should be estimated, and subsequently for maintaining the plantations \$100 per hectare per annum. Also, for superintendence, &c., \$10,000.*

A steam launch with barges would be required to carry the fruit down the river to the steamer lying off the land. And a few miles of light tramways should be constructed in parallel sections through the plantation, so as to facilitate the carriage of the fruit to the river.

The value of the crops, taking the Jamaica average before referred to, would be £177 per hectare per annum; for 300 hectares, £53,248.

Nearly all the work in connection with the plantations can be performed on the contract system, but as labor is not available on the spot a liberal rate of wages will have to be fixed in order to induce peons to settle on the property.

During the last few years coffee has become the most important article of export from Colombia, and its cultivation is rapidly assuming large dimensions. But the expansion of this cultivation is mostly confined to districts remote from the coast. In this important movement the Sierra Nevada, with all its advantages of situation, has taken no part, except perhaps at the point where this system of mountains is severed from the Andes. The slopes of the Cordillera,

* These sums indicate Colombian paper currency, at present \$12.50 to the £1.

as compared with those of the Andes, are steep and precipitous in many parts. But numerous sites, in point of adaptability, equal to those available on the Andes may be selected here. Here coffee is placed in similar climatic conditions at 1,000 feet nearer the sea-level to those on the mountains of the interior, from 5 to 7 degrees nearer the equator. At the foot of the Sierra Nevada, where one or two small plantations are being formed, I observed at a height of only 200 feet above the sea one of these plantations yielding a fine crop to be harvested just when two years old.

Selections for sites should be made on the slopes of the mountains, not on the hot plains, at from 1,500 to 4,000 and 5,000 feet above the sea.

At a short distance from Barranco, but separated by the tractless forest, is situated Cueva, the mountain property appertaining to the former. Here some excellent sites rising to 5,000 feet are available for coffee. This cultivation, in connection with the projected great plantations on the plains, merits special consideration. Among other advantages that of locality is most favorable when it is remembered that 5 pesos per quintal (about 8s. per cwt.) is no uncommon price paid for the transport of coffee from the interior to the coast. Moreover, it is both interesting and useful to have in connection with and in the immediate vicinity of the hot plains another cultivation established in the genial temperature of the mountains.

On the lower sides, as well as on the hot plains, a different species of coffee, namely, the Liberian, would find a fitting home. This species is well worthy of extensive patronage.

Having dealt in this report with the utility of embarking upon the cultivation of some of the most valuable of tropical products, it should be also noted that other specific elements of wealth await development in this district. For instance, cattle farming has always been one of the most profitable investments in Colombia. Other precious products also claim attention, such as the extensive planting of cocoanuts, which, after being planted, take care of themselves. Of coconut products Ceylon exported in 1890, in the form of fruit,

oil, copperah, fibre, &c., to the value of 7,949,727 rupees. And a considerable proportion of this comes to the United States. Besides this extent of export, as an article of diet the produce of 16,000,000 nuts are consumed locally. It may also be mentioned that recently the manufacture of cocoanut butter has become a great industry in Germany.

In conclusion it may be observed that this region, the resources of which have been so favorably reviewed in this and in my previous report, is in itself phenomenally rich in spontaneously distributed vegetable products. If we turn to the large West India islands, with which in some respects it may be compared, for, presumably, it must have narrowly escaped becoming an island, being completely isolated from the Andes on the one side, and bounded by the ocean on the other, none of these has ever exhibited such expansive spontaneous indigenous wealth of vegetable commodities valuable to commerce. Thus apart from products of minor importance may be mentioned the occurrence of wild cacao in great profusion, divi-divi spread over the plains and yielding many thousands of tons of its legumes for annual export, and henequen (*Agave rigida*) capable of yielding fibre also to the extent of many thousands tons annually. These islands (plantation colonies) were first of all made prosperous by slavery, and by the almost exclusive production of sugar for which this slavery was begotten. But sugar-cane cultivation can no longer be pronounced the privileged product for adoption by these regions. Instead of that, cultivation for more lucrative objects to meet the demands of commerce are now allotted to this new region, the Sierra Nevada; the physical features of which, moreover, offer great contrasts to and throw into the shade all the Antilles.

DEVELOPMENT OF BRITISH GUIANA.

A report to the British Foreign Office from the Governor of British Guiana gives some interesting information as to the trade and industrial development of that colony.* The report begins by saying:

“The financial year of the Colony being now the twelve months ending on the 31st March, it has been deemed convenient to alter the Blue Book year correspondingly. The volume under review, therefore, deals with the twelve months immediately preceding the 31st March, 1893, and when the results shown during that period are compared with those of the ‘preceding year,’ the latter must be taken, unless otherwise stated, to mean the calendar year 1891. Except in a few instances, the statistics for the first three months of 1892 have not been printed, as those for the following twelve months afford all necessary basis for calculation and comparison.”

The report continues:

“Important labors fell to the Combined Court of March, 1892, when assembled in Committee of Ways and Means. The Government of the United States having refused to admit the argument put forth by British Guiana, that her customs duties, being imposed for revenue purpose alone, and being neither protective nor differential, could not be regarded as reciprocally unequal or unjust, and having demanded the surrender of duties on United States products amounting to £29,000, as reciprocity for the admission of her sugars duty free into the United States, it became the task of the Combined Court to replace that revenue from other sources, and so to apportion the incidence of taxation to bring under its operation those who had benefited by the remission of the duties, and who might be fairly expected to bear their share of the burden of replacing them.”

* Colonial Reports No. 101. Presented to Parliament, February, 1894.

"But it was fortunately unnecessary to provide the whole of this £29,000. The revenue of the colony from other sources had been steadily expanding, and it was found, after the estimate of expenditure for the ensuing year had been framed, that an additional sum of £17,500 would be sufficient to meet it. Of this deficiency, the planters of the colony, who are the principal beneficiaries under the agreement with the United States, at once assumed a direct responsibility for nearly one-half, to be paid in the convenient form of a tax of 2s. 1d. per acre on sugar estates, which was estimated to yield over £8,000.

"To provide the remainder of the revenue required was not difficult. An additional 5d. in the ton, on the tonnage dues payable by ships bearing the products of other countries to our improved market and enjoying the commodity of the harbor of Georgetown, was estimated to yield £4,400; the stamp duties, which had been abandoned by the Combined Court of 1891, were reimposed in the expectation that they would bring in about £3,000; and finally, as the duties remitted were in many cases too small to benefit the consumer, a contribution was levied on the middle-man by increasing the shop licenses of the several classes. From this last-named source an increased revenue of £1,900 was expected."

The revenue of the colony during the year 1892-'93 amounted to £573,463, exceeding that of the previous year by £10,300. The expenditure amounted to £542,469, being £717 less than that of the previous year, and showing a surplus of revenue over expenditure for 1892-'93 of £30,994.

With reference to immigration, the report says:

"India continues to be the only steady source of the labor supply of the colony, and 2,862 men, 1,201 women, with 630 children, in all 316 less than the year before, were introduced in 1892, and at its close the East Indian population of the colony was estimated at 109,673. Of these 71,011 were resident on estates, 17,339 being under indenture, and the rest, including 16,640 children, free; the remainder were scattered about the colony in villages or engaged in other industries.

"The mortality amongst the indentured immigrants was twenty-six per thousand, and amongst the unindentured thirty-six, a slight increase on the previous year, due to the epidemic of influenza.

* * * * *

"The facilities offered by the Indian and Colonial Government for the remittance of small sums of money to friends and relations in India were largely used, and £3,080 were so remitted during the year. There stood to the credit of Indian immigrants in the savings banks of the colony £113,315, or £1 per head of the population, including children.

"Four hundred and twenty-one marriages were 'arranged' on board ship, and duly recorded on arrival in the colony."

The following are statistics of imports and exports:

The imports for the year amounted to £1,780,319, or £72,550 more than in 1891, while the exports were £99,341 less than those of that period, the actual figures being £2,433,213, as against £2,532,554.

The imports amounted to £6.8 per head of the population, and the exports to £8.14.

The following comparative statement shows the direction and value of the trade of the colony in 1891 and 1892-93:

COUNTRIES.	IMPORTS.		EXPORTS.	
	1891.	1892-93.	1891.	1892-93.
United Kingdom.....	£ 927,397	£ 949,051	£1,220,518	£1,270,794
United States.....	374,935	437,395	1,109,083	980,563
British North America.....	72,106	91,012	44,825	63,820
British West Indies.....	95,128	76,993	37,987	25,019
Bermuda.....	1,109	1,014	2,464	1,177
East India.....	140,718	134,404	223	605
Foreign countries other than U. S.....	88,774	86,735	116,759	89,769
African possessions.....				486
Newfoundland.....	7,602	3,715	695	980
Total.....	£1,707,769	£1,780,319	£2,532,554	£2,433,213

The report states that the telegraph lines of the colony have been renewed in many places, and that a cable fifty-four miles in length has been laid between Georgetown and Bartica, a town at the junction of the Massaruni and Essequibo rivers.

With reference to railways and roads, the report says:

“The only railway which British Guiana has ever possessed is a short line of twenty-one miles from Georgetown to Mahaica, but for many years the question of extending it to the left bank of the Berbice River has engaged the attention of the Government and the Legislature. The general terms of an agreement have been arranged with the Demerara Railway Company, who own the present line, and it may be hoped that within three years, the Demerara and Berbice Rivers will be connected by rail, and the towns of Georgetown and New Amsterdam will be within two or three hours’ reach of each other. The extension will cover some forty miles, and the terms of construction are roughly a government guarantee for fifty years of interest at the rate of four per cent. on the cost of construction, a moiety of working profits over four per cent. being handed over to the government in discharge *pro tanto* of any moneys paid under the contract. The amount guaranteed by the government is approximately the same that is now paid as a subsidy for the steamer service between Georgetown and New Amsterdam, and the road mail service from Mahaica, the present terminus of the railway to Blairmount on the Berbice River. These subsidies will, of course, be withdrawn.

“The existing line is a paying concern. The passenger and goods receipts for the year amounted to £38,824, and the total expenditure to £21,398.

“The roads of the colony run 268 miles along the coast and the banks of the rivers. One hundred and forty-six miles are maintained by government, and cost, with bridges, £16,391. The remainder are maintained almost wholly by the proprietors of the sugar estates through which they run.”

With reference to the general outlook, the report says:

“After years of unprofitable struggle with depressed industries, the colony has emerged confident and unshaken,” and “Seldom in the history of the colony, have the evidences of present prosperity and indications of future wealth been so marked as to-day.”

VI.

COMMERCIAL AND INDUSTRIAL INFORMATION.

ARGENTINE REPUBLIC.

A movement has been started in the Argentine Republic for a system of irrigation to obviate the disastrous effects of droughts in the agricultural districts. A drought of unparalleled severity set in last November and continued until the end of January. The result was that the maize crop was a complete failure, and cattle and sheep perished by thousands. From an engineering point of view, the project is said to be entirely practicable, as the rivers and streams of the country afford almost inexhaustible supplies of water, and in the rainy season, become swollen to such an extent as to render it possible to store immense quantities in reserve tanks. Supplementing these, a system of parallel canals from various points on the rivers is advocated, as well as the sinking of artesian wells. One of the results of the recent drought has been to turn the attention of farmers and stock raisers to other portions of the Argentine Republic, which, it is thought, will not be liable to this objection. The districts affected by drought, it is predicted, will hereafter be devoted more largely to the cultivation of wheat, which does not suffer so much from its effects as do cattle and sheep and the maize crop. The production of wheat in Argentina is increasing by rapid bounds; the wheat exports jumping from 326,000 tons in 1890, to 1,000,000 tons in 1893, and it is claimed that the exports during the current year will reach 2,000,000 tons.

The official report of immigration to the Argentine Republic in 1893 serves to show that the country is steadily recovering from the depression of previous years. The arrivals numbered 110,226, and the departures 64,100, the balance in favor of the Republic being 46,126. During the previous year, 1892, the arrivals were 93,550,

and the departures 55,282, the balance in favor of the country being 38,268, or 7,858 less than in 1893. The *South American Journal* says: "This is distinctly encouraging. It is a conclusive confirmation of the fact that the crisis is lifting, and that Argentina is again entering upon an era of prosperity, which, established on a more stable, because less speculative foundation, cannot fail to be of permanent benefit to the nation. We look upon this increase of immigration as one of the most encouraging features of the Argentine situation, and it is full of promise for all who are interested in the progress of the country."

Lyman & Company, an English Steamship Company of Cardiff, Newcastle and London, have started a regular line of steamers between Buenos Aires and Europe.

The telephone line between Buenos Aires, Argentine Republic and Montevideo, Uruguay, is said to be a financial success. The profits for last year are reported as amounting to \$48,000, which enabled the directors to declare a dividend of 6 per cent.

The population of the city of Buenos Aires was estimated on January 1, 1894, at 580,371.

The Senate of the Argentine Republic was recently engaged in considering a bill to authorize the Government to take a new census of that country.

The completion of the South Coast Railway to Atalaya, Argentine Republic, has already proved of great service to the Saladeros (packing houses). Some consignments have already been sent to La Plata, and thousands of tons, it is said, are being prepared for shipment whenever the port of Rio is opened. Formerly, all this produce was sent by lighters, which sometimes could not approach the shore within a mile or so; now, the railway delivers alongside the ship.

BRITISH HONDURAS.

It appears that the people of British Honduras are contending with several obstacles in the agricultural development of that colony. "The first real honest attempt to foster the agricultural interests of

the colony," says the *Colonial Guardian* of Belize, "was made by Sir Frederick Barlee, not only by reducing the price of land to \$1 per acre, but by changing the mail route from Jamaica, with which we had no trade, to New Orleans, with which we had a large and increasing trade, and which was the greatest importer of tropical fruits in the United States." The results which might have been expected did not follow, and additional measures are now advocated. The lack of progress is attributed partly to administrative inactivity, and in a great measure, to want of population in excess of that employed in the wood industry. Immigration from Spanish Honduras, which seemed to be on the point of growing largely, has been checked, it is stated, by the inability on the part of the immigrants to secure lands on advantageous terms. It is now suggested that the price of town lots be lowered, and that surveys of grants be made more promptly.

CHILE.

The Chilean Congress closed its session on the 17th of January without taking action on the application of the contractors for building the Transandine line for an extra guarantee. The failure to act means the loss of several months in beginning the work of building the last link to connect the Chilean and Argentine sections by means of a tunnel and of some thirty miles of road. This great railroad when completed will provide transportation across the South American continent from Buenos Aires to Valparaiso. The Messrs. Clark, who are the contractors, were unable to obtain the capital to build the last link which is the most difficult and the costliest part of the road, unless Congress would agree to raise the guarantee from 4 to 5 per cent. Congress is said to have been favorable to the proposition, but its passage was defeated for the time being by obstruction tactics. The *Chilean Times* says: "It will pass, however, next session in spite of obstructionists, for the country has already pronounced in favor of it."

Four railway acts have been promulgated by the Chilean Government. One is for a narrow gauge line from Antofagasta to Aguas

Blancas, with branch lines to the Nitrate Works of that district. The second is for the prolongation of the Tongoy line from Cerrillos to Trapiche. The third is for the construction of a line from Rancagua to Peumo, and the fourth provides for the acquisition of the land necessary for the electric tramway between Santiago and San Bernardo.

Statisticians calculate the population of Chile at the end of 1893 at 3,417,000 inhabitants, in which number* are included 50,000 Indians.

JAMAICA.

Information as to a number of industrial and commercial enterprises in the Island of Jamaica has been received. The subject of ramie cultivation in Jamaica has been treated in preceding pages of this Bulletin. A proposal of Mr. Plant, of the Plant Steamship Line, to establish a regular line of steamers between Florida and Jamaica, is apparently receiving strong support in Jamaica. Mr. Plant is quoted as saying: "I think satisfactory arrangements could easily be made, and the cost would not be very great, to run a steamer fortnightly for five or six months during the winter and spring season, which would undoubtedly prove a paying investment for the island. What is most wanted is regularity. A line run from Tampa should go on regular days and at regular intervals, so timed as to make connection here with the Royal Mail steamers, and this would very likely attract a large number of people. * * * I have been running a line of steamers between the port of Tampa and Cuba for several years, and I am proud to say that we have never missed a trip, although we have a semi-weekly service in summer and a tri-weekly in winter. When we commenced that service very few people traveled by steamer, but now the hotels in Cuba are unable to accommodate all the people we take down." Continuing, Mr. Plant said: "When the railway line (in Jamaica) is completed to Montego Bay and Port Antonio, which, I understand, will be about next September or October, the distance of the sea voyage will be somewhat short-

ened, and the attractions of the country considerably increased. People will have an opportunity of travelling through the island by rail, and there will not be the same difficulty in getting about from one place to another. It would also give a decided boom to the fruit trade, and fruit steamers could be easily run from Port Tampa to Montego Bay in a very short time as compared with the present voyage to New York."

The practical results of Mr. Plant's proposal, as stated by the Kingston *Gleaner*, would be the establishment of a new route for passenger traffic to and from South America and the North, the opening up of a new market for Jamaica fruits and the carriage of the Jamaica mails in four or four and one-half days to New York. It is possible also that the steamship company would establish their own hotels in Jamaica.

The Atlas Steamship Co. is said to be making an endeavor to reopen the orange trade between New York and Jamaica, and has recently asked for offers of five hundred barrels to be provided fortnightly. The difficulty in the way of developing this trade heretofore has been careless packing of the fruit.

Attention is being directed in Jamaica to the possibility of developing a trade in fruits between that island and Great Britain. The fact that the fruit trade between the United Kingdom and the Cape of Good Hope is being successfully prosecuted suggests the question whether similar results could not be obtained for Jamaica fruits. With the inauguration of the shorter passage by the Royal Mail Line, which is announced to occur shortly, it is thought that the conditions would be very favorable for such an experiment.

The efforts of Mr. Edmund M. Earle, of the Caribbean Sea Fishing Development Syndicate, (limited,) to develop the fisheries of Jamaica and contiguous waters, are still being prosecuted. Mr. Earle asks for government assistance in the shape of a money grant, and remission of duties, fees, etc. At present, large quantities of foreign fish are imported into Jamaica, and it is thought that the population can be furnished with a fresh and adequate daily supply at low prices from the neighboring waters. The

enterprise also contemplates curing and canning fish for export, the cultivation of oysters and the development of the turtle trade.

The preliminary work in connection with the drainage and reconstruction of the streets of the city of Kingston, Jamaica, has been begun, and at last advices, the engineer and his assistants were waiting for pipes and material from England to begin the actual operations. No definite decision has been reached concerning the pavement, but it is thought probable that asphalt blocks will be used in the principal streets.

The Director of Gardens and Plantations in Jamaica deals in his last report with the subject of the future of coffee planting in the island. The maximum export of coffee was reached in the year 1814, when it amounted to 34,045,585 pounds. Economic changes in the island resulted in the decline of the exports. Within a few years past, there has been some revival, but the quantity has only ranged between 8,000,000 and 10,000,000 pounds. "While storms and droughts inflicted heavy blows," says the *Kingston Gleaner*, "capital frightened, labor wanting, and competition vigorous have been the main factors in reducing our coffee exports." The Director's remedy for the prostration of this industry is stated to be "more roads and a better supply of labor." Capital, he thinks, would come if these two things could be guaranteed. A resident of one of the coffee growing districts is reported as saying: "I think that the mountain lands of Portland would be taken up for the cultivation of coffee, if the Government could see their way to making riding tracks into the Crown lands for sale." The lands should be sold for a nominal sum, say 4s. per acre, where the roads were easy, and 2s. per acre in the highest slopes, with a proviso that, say 10 per cent. of the land purchased should be put under cultivation each year for the first three years, and five per cent. for the next three years. The payment for the land should be, say 25 per cent. on possession; balance in equal payments divided over a period of six years."

The Annual Report of the Protector of Immigrants of Jamaica, supplies information as to the importation of East Indian coolies

into that island. During the past year, 480 coolie immigrants arrived. It is said that the coolies in Jamaica are satisfied with the conditions there, as is shown by the fact that many, after serving a stipulated time and revisiting India, return to Jamaica. The Protector endeavored to procure returns showing amount of stock and land in possession of the coolies, but owing to their reticence, it is stated, "the information is not so complete as it may yet become. Sufficient was obtained, however, to demonstrate that the coolies are taking kindly to the island, and are in many instances settling down and forming settlements." The work they perform is well done, and they are earning good wages.

MEXICO.

The proposed establishment of a line of steamers between Baltimore and Tampico, Mexico, is expected to produce important results in the development of trade with Mexico. The harbor of Tampico is a very fine one, and two roads have their terminals at that point, namely, the Mexican Central and the Monterey and Mexican Gulf. The experiment is to be made by the Johnstone Line, now running from Liverpool to Baltimore, of a regular steamship service between Baltimore and Tampico, and it is expected to export to Tampico the products of the Maryland and West Virginia coal mines.

A movement is also on foot for the establishment by the Illinois Central Railway Company of a steamship line between New Orleans and Tampico for the purpose of carrying the products of the United States coming out of the Mississippi Valley for Mexico to Tampico, and in order to bring the Mexican commodities of exchange back by the same route. This movement has the support of the Mexican Central Railroad, which extends from Tampico to the City of Mexico, and from the latter city to El Paso, Texas. The proposed steamship line would connect with the Mexican Central at Tampico, and receive from it commodities brought to that port. The New Orleans *Picayune*, commenting upon the project, says: "The *Picayune*, some days ago, referred to the fact that all indications pointed,

unmistakably, to the great increase in the coffee trade of this city in the near future. More frequent steamship communication with Mexico and Central America will help to bring this about, and should it be found practicable to inaugurate a line of steamers between this port and Brazilian ports, still more rapid strides would be possible in the way of increasing the coffee business."

The *Picayune*, of a subsequent issue, states that the French steamship line which has decided to place large steamers on the route between New Orleans and Havre proposes also to establish a line between New Orleans and Brazilian ports, and also between that city and the Argentine Republic. "These lines," says the *Picayune*, "are expected to afford increased facilities for the coffee trade, as well as to divert a portion of the South American wool trade in this direction. The representatives of this enterprising line propose to make arrangements to handle imports of coffee intended for the Pacific coast, as such imports can be handled more expeditiously through New Orleans than overland by mail from New York, the distance by this route being fully one-third less."

A recent number of the *Mexican Financier* expresses the opinion that, indirectly, Mexico is gaining by the low price of silver, as the demand for land suitable for coffee and other cultures is steadily on the increase, "a fact which is largely explained by the stimulus given to agriculture by the high exchange, which benefits all exporters of staple tropical products." There is said to be a movement on foot in London to bring over 5,000 colonists to settle on coffee lands in Chiapas, under the auspices of the Salvation Army.

It is stated that the Government of Oaxaca, Mexico, is endeavoring to set apart for the cultivation of coffee, without encroaching on private property, about 30,000 acres of land. "It is to be presumed," says the *Two Republics of Mexico*, "that this land belongs to the government, and that it may be purchased at the regular tariff price. If this is the case, the Governor of Oaxaca has it in his power to render the whole country a very valuable service by establishing the precedent of each State finding and surveying all the public lands within its limits. . . . If these lands are surveyed into small

holdings of from one hundred to two hundred acres, and only sold to actual settlers, they would be immediately purchased by Mexicans or foreigners. In this way, the population and the production of the State will be rapidly and materially augmented."

Mr. Lucien Plessy, a contractor from the United States, is building four frame houses, with sloping roofs, "on the American plan," for Sr. Amado Talavera, in Córdoba, Mexico. A number of other persons are having plans made for similar houses to be built in the vicinity of Córdoba. The *Mexican Trader* says that there is a special advantage in building these houses in the hot country, when built on high brick foundations, as they are cool and dry, not being damp like the ordinary Mexican stone houses.

"As the result of nearly three centuries of work," says the *Two Republics of Mexico*, "the great drainage system of the valley of Mexico is nearing completion." Eighteen months will see the opening of the great water-way for the escape of the imprisoned floods of the valley, which, in centuries past, have been a menace to the city and its safety. The canal and tunnel through the mountain range have a total length approaching forty miles. Nine-tenths of the tunnel, six miles in length, is now complete, and on the 5th of next May it is expected that it will be open throughout. The tunnel discharges into the Rio Panuco, and thence into the Gulf of Mexico, draining the valley and freeing it not only from the danger of floods, but from the sanitary evils which have long resulted from defective drainage. The total cost of the work will be about \$10,000,000.

Information is at hand of the perfecting of a project for Mormon colonization in Northern Mexico, which, it is stated, rivals in size and importance the first migration to Utah. A contract has been drawn up for the purchase by the Mormon Church of three million acres of land and the settlement of twenty thousand Mormon colonists. The representatives of the Mormons are A. F. McDonald, George A. Teasdale, Brigham Young and Henry Evering, of Salt Lake City, Utah. The movement is said to be the culmination of a plan by which the Mormons are to remove in large numbers from Salt Lake City to this portion of Mexico. The tract is situated in

the Degollado district of Northern Chihuahua, about one hundred and twenty miles south of New Mexico. The land is part of the highlands of Chihuahua, and lies at an elevation of seven thousand feet above the sea. It is said to be fertile and especially adapted for grazing purposes. It is also rich in timber. Brigham Young and other Salt Lake City capitalists obtained a concession from the Mexican government for the construction of the road from Deming to Guaymas, but after completing nearly one hundred miles of grading abandoned the work. This concession was recently taken up by General Mexia and Mr. Lancaster Jones, of the City of Mexico, who are now preparing to build the road, which will tap the great lumber regions of the mountains of Northern Mexico, and will open up a route into the United States to the north and to the ports of the Pacific on the west. The survey passes through the present Mormon colonies of Juarez, Porfirio Diaz, Pachecho and Dublin, in Northern Chihuahua. These colonies have been established for nine years, and are said to be in a prosperous condition. The colonists have reclaimed the wilds, and have large farms under cultivation with orchards, flour mills, cheese factories, dairies, woodenware factories and other industries. One of the Mormon agents is quoted as saying that polygamy will not be re-established in Mexico.

The City Council of Mexico has granted a concession to Mr. J. Carter, of Chicago, for the establishment in that city of a messenger service such as is in use in the cities of the United States.

Rapid progress on the railroad across the Isthmus of Tehuantepec is reported. The work is being done by an English contractor for the Mexican government, and is said to be approaching completion. It is now said that the line will be finished in July next.

A project is on foot to settle Belgians in the State of Michoacan, Mexico. Mr. I. Verplanken, a Belgian established in business at Patzcuaro, is mentioned as the promoter of the scheme. The colonists are to engage in agricultural pursuits.

MISCELLANEOUS.

It is proposed to turn a portion of the unfinished Panama Canal to account. During the stormy weather, the port of Colon is difficult of access. On the Panama side, vessels lie at anchor in the bay, and cargoes have to be lightered to and from the city. It is now suggested to utilize portions of the abandoned canal for improved harbor facilities. For this purpose, four miles on the Panama side, and about fourteen miles on the Colon end, could be rendered available, securing safe harborage for vessels, and enabling cargoes to be transferred from steamers to the cars of the Panama Railway.

At the opening of the new Congress of Uruguay on the 15th of February, President Herrera read a message giving an account of last year's administration, and enumerating the various economies which had been effected. The Budget, it is said, in spite of a decrease of revenue, "showed almost an equilibrium between receipts and expenditures."

A commercial treaty has just been concluded between France and Bolivia, according to which the latter country grants the treatment of the most favored nation to French products. France, in exchange, applies her minimum tariff to imports from Bolivia.

