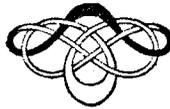
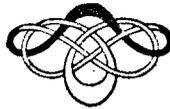


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Handbook of Commercial  
Information for India



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Handbook of Commercial  
Information for India

*By*  
C. W. E. COTTON, C.I.E., I.C.S.  
*Agent to the Governor-General, Madras States  
formerly Collector of Customs, Calcutta*

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## PREFACE TO THE FIRST EDITION.

THE object of this Handbook is to give readers in other parts of the world a bird's-eye view of the foreign trade of British India. The undertaking was suggested by Mr. Chadwick, Indian Trade Commissioner in London, who pointed out that though Sir George Watt's 'Dictionary of the Economic Products of India' and the abridgment of that work entitled 'The Commercial Products of India' furnish much valuable information, they are not compiled on lines directly helpful to business men and omit many details which foreign traders want to know. A handbook with many of the features suggested by Mr. Chadwick, but dealing with the trade of the Madras Presidency only, which appeared in 1916, and the consular report compiled by Mr. Baker, American Consul at Bombay, and published in Washington in 1915, contain much of the necessary material, but as the latter was written chiefly with the object of interesting American exporters in India's import trade, the information to be found in it regarding exports is generally not sufficiently detailed. From the point of view from which the present book is written the import trade is of secondary importance, and general economic conditions and the difficulties of currency and finance which have hampered commercial development in India from time to time have only been briefly alluded to. In the case of every article of present or potential importance figuring in the statistics of exports, however, an attempt has been made to specify the areas in which it is obtainable, the port or ports from which it is shipped, the method of marketing and the unit of sale and shipment. India is so vast and so remote that there is no doubt that on the Continent and in America, if not in the United Kingdom, abundant ignorance prevails with regard to the commercial geography of the country and her trade potentialities. The earlier chapters in the Handbook deal with the principal ports and the facilities for trade at each, while the chief commercial organisations are enumerated and their activities described. Elsewhere will be found a conspectus of the various weights and measures in use in the chief trade centres, while the appendices contain the tonnage schedules in force at the five principal ports and a glossary of the vernacular terms which occur in the book. It is hoped that this varied material will

enable all who are anxious to purchase India's manufactures or raw materials to make larger use of the opportunities which undoubtedly exist for increased trade

I take this opportunity of expressing my grateful acknowledgments to the numerous friends, official and non-official, who have scrutinised my draft articles and assisted me with material. Among the numerous books consulted in addition to those referred to earlier in this preface, the 'Quinquennial Review of Mineral Production in India' (1909-1913) and the 'Munitions Board Handbook' (1919) have been found particularly helpful. My clerk, M. A. Krishnan, who has seen the book through the press and is responsible for the statistical tables and the index, deserves special mention.

C. W. E. COTTON.

CALCUTTA:

26th September, 1919.

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### PREFACE TO THE SECOND EDITION.

The opportunity offered for a wider circulation of this Handbook by the British Empire Exhibition at Wembley, coinciding with the practical exhaustion of the first edition, has prompted the Government of India to ask me to prepare a new edition this year. No new features have been introduced, but the statistics have been brought up to date and the letter-press generally revised. My special thanks are due to those who have helped me to make Parts III A, IV, and V more complete, and to the Commercial Intelligence Department which recruited and supervised the work of the tabulating staff, who have worked hard and well.

C. W. E. COTTON.

MADRAS STATES AGENCY:

Trivandrum, April, 1924.

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NOTE.—All the sterling figures in this volume are calculated on the basis of 1 Rupee = 1s. 4d.

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MAP

# Handbook of Commercial Information

## PART I

### INTRODUCTORY

India is the largest of the three peninsulas which mark the southern configuration of the continent of Asia. This peninsula falls into four well marked divisions. Firstly, the Himalayan range which forms a great natural frontier including the valley of Kashmir and the kingdom of Nepal with Bhutan, abutting on the great tableland of Tibet. Secondly, the Indo-Gangetic plain lying between the mountain range to the north and a line drawn from Karachi to Delhi and Delhi to Calcutta. South again of this line is the peninsula proper with an elevated plateau in the centre buttressed towards its southern extremities by two ranges of hills known respectively as the Eastern and Western *ghats*, the former being much more distinctive and considerable. The fourth division Burma, which properly belongs to the Malayan peninsula, lies to the east.

The total area of the Indian Empire is 1,805,332 sq. miles, with a population (according to the Census of 1921) of 318,942,480 people.

**Area.** It is perhaps not generally appreciated what a large portion of this is not directly under British administration. The area of British India is 1,094,300 sq. miles, with a population of 247 millions, while the Indian States comprise 711,032 sq. miles, with a population of 72 millions.

The territory under the control of the Governor-General in Council is divided into nine major provinces and six lesser charges, each with its separate Local Government or Administration. The Local Governments are the three presidencies of Madras, Bombay, and Bengal, the United Provinces of Agra and Oudh, the Punjab, Burma, Bihar and Orissa, the Central Provinces, and Assam. The minor administrations include the North-West Frontier Province, Delhi, British Baluchistan, Coorg, Ajmer-Merwara, and the Andaman Islands. The following statement shows the administrative divisions of British India, and the present form of Government.

TABLE No. 1.—*The administrative divisions of British India with their area and population.*

Divisions.	Form of Government.	Headquarters.	Hill Station.	Area (sq. miles).	Population (1921 Census).
Presidencies—					
Madras . . . . .	Governor-in-Council	Madras	Ootacamund	142,260	42,318,985
Bombay* . . . . .	„	Bombay	{ Mahabaleshwar Poona	123,621	19,348,219
Bengal . . . . .	„	Calcutta	Darjeeling	76,843	46,695,536
Provinces—					
United Provinces . . . . .	„	{ Allahabad Lucknow	Naini Tal	106,295	45,375,787
Punjab . . . . .	„	Lahore	Simla	99,846	20,685,024
Burma . . . . .	„	Rangoon	Maymyo	233,707	13,212,192
Bihar and Orissa . . . . .	„	Patna	Ranchi	83,161	34,002,189
Central Provinces† . . . . .	„	Nagpur	Pachmarhi	99,876	13,912,760
Assam . . . . .	„	Shillong	Shillong	53,015	7,606,230
Administrations—					
North-West Frontier Province . . . . .	Chief Commissioner and Agent to the Governor-General.	Peshawar	Netragali	13,419	2,251,340
Baluchistan . . . . .	Agent to the Governor-General and Chief Commissioner.	Quetta	Quetta	54,228	420,648
Ajmer-Merwara . . . . .	Agent to the Governor-General, Rajputana, and Chief Commissioner.	Ajmer	Mount Abu	2,711	495,271
Coorg . . . . .	Chief Commissioner‡ .	Mercara	Mercara	1,582	163,833
Delhi . . . . .	„ .	Delhi	Delhi	593	488,188
Andaman and Nicobar islands . . . . .	„ .	Port Blair	Port Blair	3,143	27,086

\* Including Sind and Aden.

‡ Held as a collateral appointment by the Resident in Mysore.

† Including Berar.

The map shows that, while a considerable portion of the interior is comprised of Indian States, they contain no port of even second rate importance and except for Kathiawar, Baroda and Travancore, the coast line is held practically without interruption by British provinces. The consequence is that the contribution of Indian States to the volume of exports, though undoubtedly considerable, is almost completely obscured in the statistical tables, as shipment is necessarily effected in most instances from British Indian ports. The largest Indian State in area is Kashmir with Jammu in the extreme north-west but in wealth and population Hyderabad is the premier State and its ruler, the Nizam, is distinguished by the appellation of His Exalted Highness. Next in importance are the progressive States of Mysore, Baroda, Gwalior and Travancore, which all possess considerable economic resources which are only just beginning to be developed. The principal States in the Kathiawar Agency are Nawanager (3791 sq. miles) Junagadh (3336 sq. miles) and Bhavnagar (2860 sq. miles). Nepal (area 54,000 sq. miles: population 5,600,000) has by the treaty of Segowlie been recognised as an independent kingdom. The British Envoy at the Court of His Majesty the Maharajadhiraja, an officer of the Foreign and Political Department of the Government of India, does not interfere in the internal affairs of the State.

The following table shows the principal Indian States with their area and population.

TABLE No. 2.—*The principal Indian States with their area and population.*

Name of the State.	Area. (Sq. miles.)	Population. (1921 Census.)
Kashmir and Jammu . . . . .	84,268	3,320,518
Hyderabad . . . . .	82,698	12,471,770
Federated Shan States . . . . .	56,313	1,433,542
Jodhpur . . . . .	35,066	1,848,825
Mysore . . . . .	29,475	5,978,892
Orissa Feudatory States . . . . .	28,046	3,807,172
Gwalior . . . . .	26,367	3,186,075
Bikaner . . . . .	23,315	659,685
Kathiawar Agency . . . . .	20,911	2,538,497
Bhutan . . . . .	18,000	260,000
Jaipur . . . . .	16,682	2,338,802
Bhawalpur . . . . .	15,000	781,191
Rewa . . . . .	13,000	1,401,524
Udaipur . . . . .	12,915	1,406,990
Indore . . . . .	9,519	1,151,578
Manipur . . . . .	8,456	384,016
Baroda . . . . .	8,127	2,126,522
Travancore . . . . .	7,625	4,006,062
Cutch . . . . .	7,616	484,570
Bhopal . . . . .	6,902	692,448
Patiala . . . . .	5,942	1,490,739
Kolhapur . . . . .	3,217	832,726
Alwar . . . . .	3,213	701,164
Cochin . . . . .	1,479	979,680
Cooch Behar . . . . .	1,318	592,489
Pudukotta . . . . .	1,179	426,813
Rampur . . . . .	899	453,607
Kapurthala . . . . .	598	284,275

Since 1858 the Supreme Authority in India is vested in the Crown acting through a Secretary of State assisted by a Council. In 1920 a

High Commissioner for India in London was appointed under the provisions of Section 29-A of the Government of India Act, 1919, who discharges functions in England similar to those of the High Commissioners representing the self-governing Dominions. The administration of the Government of India is vested in a Governor-General who is also Viceroy, assisted by an Executive Council and the Commander-in-Chief as *ex-officio* extraordinary member. The six ordinary Members of the Executive Council hold separate portfolios, the present distribution being Home, Education and Health and Lands, Commerce and Railways, Industries and Labour, Finance, and Law and Legislation. Under the control of the Education, Health and Lands Department are Agriculture and Forests, while railway affairs are controlled by a Railway Board under a Chief Commissioner who has the right of direct access to the Viceroy. Posts and Telegraphs, Public Works, and Irrigation are controlled by the Department of Industries and Labour. Under the Finance Department there is the Central Board of Revenue in charge of Customs, Excise, Income tax and Provision Opium. The Commander-in-Chief holds charge of the Army Department. Foreign affairs are the special portfolio of the Viceroy. More detailed information is given in Part III, of the work of the principal departments which have commercial or *quasi*-commercial interests.

Under the Government of India Act, 1919, the development of industries has become a provincial transferred subject. The policy to be pursued in the matter of granting assistance to industries, the development of technical and industrial education, and to a large extent the research work necessary to establish the value of raw materials, is now determined by the Ministers in charge of the provincial departments of industries. The proposal of the Indian Industrial Commission which sat from 1916 to 1918 under the Chairmanship of Sir Thomas Holland, to create an Imperial Industrial Service has in consequence of these changes not materialized but the constitution permits the Central Government to retain control over industrial subjects when it considers such a course to be necessary.

## PART II

### THE INDIAN RAILWAY SYSTEM

The total length of railways opened in British India and Indian States on 31st March 1923 amounted to 37,618 miles of which 18,389 miles were of the standard gauge (5' 6"), 15,508 miles of the metre gauge (3' 3 $\frac{1}{2}$ ") and 3,721 miles of other gauges (2 $\frac{1}{2}$ ' and 2'). These figures include the West of India Portuguese Railway (51 miles) running for all but two miles of its length in Portuguese territory and the Villupuram-Pondicherry and Peralam-Karikal lines (22 $\frac{1}{2}$  miles) which are partly in French India. The total mileage under construction or sanctioned for construction at the same date aggregated 1,776 miles.

The Government of India exercises under the Indian Railways Act, 1890, certain general powers in respect of all the railways in India and has a preponderating financial interest in nearly all of them. Up to 1922 all railway administrations for which the Government of India has to provide funds had to submit an annual programme to the Railway Board, which prepared a general programme of capital expenditure for the ensuing year for the sanction of the Secretary of State, and the Government of India made budget provision for the needs of each railway according to the programme finally sanctioned. But in pursuance of the recommendation of the Railway Finance Committee, it was decided by the Legislative Assembly in March 1922 that the capital programme of railway expenditure should be fixed for five years in advance, provision being made for an expenditure of Rs. 30 crores per annum or a total of Rs. 150 crores during the quinquennium. In accordance with this decision the programme of capital expenditure for 1922-23 was framed for Rs. 30 crores. The actual expenditure during the year was, however, Rs. 19.03 crores (including Rs. 60 lakhs representing outlay on Provincial railways) only. The carry over from 1922-23 on the basis of revised estimates for the year was expected to be Rs. 8.64 crores and the grant for 1923-24 was accordingly fixed at Rs. 38.64 crores (£25.76 millions).

The capital expenditure budgetted for during the last eleven years is tabulated below. The reduction in capital expenditure during the period 1914-15 to 1919-20 was due to circumstances arising out of the war, partly to measures of economy deliberately enforced, and partly to the difficulty experienced in importing materials and stores from Europe.

TABLE No. 3.—*Capital expenditure incurred between 1913-14 and 1923-24 for railways (including Provincial lines).*

Year.	Capital ex- penditure.
	£
1913-14 . . . . .	12,316,000
1914-15 . . . . .	11,432,000
1915-16 . . . . .	4,492,000
1916-17 . . . . .	1,980,000
1917-18 . . . . .	2,528,000
1918-19 . . . . .	4,159,000
1919-20 . . . . .	9,363,000
1920-21 . . . . .	17,388,000
1921-22 . . . . .	15,553,000
1922-23 . . . . .	12,686,000*
1923-24 . . . . .	25,760,000*

\* Budget.

The diversity of conditions governing the relation of the State to the railways in India is due chiefly to the variations of policy adopted from time to time towards railway construction.

**Chief railway systems.** Broadly speaking, the principal railways fall under three categories—firstly, the three railways owned and worked by the State, *viz.*, the North Western, the Eastern Bengal and Oudh and Rohilkhand railways; secondly, those owned by the State but worked on its behalf by companies enjoying a guarantee of interest from Government, eight in number, *viz.*, the East Indian, the Great Indian Peninsula, Bombay, Baroda and Central India, Madras and Southern Mahratta, Assam-Bengal, Bengal-Nagpur, South Indian, and Burma railways; and thirdly, lines the property of private companies and worked some by the owning companies and some by the State or by companies working State-owned systems, the principal being the Bengal and North-Western, Rohilkund and Kumaon and Southern Punjab systems. Besides these there are an increasing number of lines which are the property of Indian States or District Boards or constructed under a guarantee of minimum interest given by such Boards. Of the total mileage, open on 31st March 1923, of 37,618 miles, 27,005 miles were State-owned, or about 72 per cent, and 7,679 miles, or 20 per cent directly managed by Government.

For many years the railway system was a drain upon the finances of the Government of India, but the tide began to turn with the expansion of irrigation in the Punjab and Sind, which

**Railway surpluses.** made the North Western railway one of the greatest grain-distributing lines in the world. During the war working expenses were low, mainly owing to the fact that material for replacements and renewals could not be obtained from abroad. On the otherhand the earnings showed a large improvement year after year, and therefore from 1914-15 the net profit to the State steadily increased. During the war there was practically no expenditure on new construction. Several smaller lines were closed and the rails taken up and sent to Mesopotamia with the result that in 1920 it was found that there

were great deficiencies in rolling stock and equipment to be made good, and heroic measures were adopted to bring the condition of the railways generally up to the standard of increased passenger and traffic requirements. With the return of more normal conditions the profit decreased considerably in 1919-20 and 1920-21. In 1921-22 the railways worked, for the first time for many years, at an actual loss owing mainly to the great stagnation of trade throughout the year and unavoidable increase in working expenses. This loss was converted into a small profit in 1922-23 by recourse to increased freights and fares.

TABLE No. 4.—Profits and losses earned by State railways (including Provincial railways) from 1913-14 onwards.

Year.	Gross.*	Nett.†
	£	£
1913-14 . . . . .	17,973,000	+4,790,000
1914-15 . . . . .	16,419,000	+2,158,000
1915-16 . . . . .	18,489,000	+4,075,000
1916-17 . . . . .	21,986,000	+7,482,000
1917-18 . . . . .	25,042,000	+9,914,000
1918-19 . . . . .	26,120,000	+10,568,000
1919-20 . . . . .	22,421,000	+6,231,000
1920-21 . . . . .	17,641,000	-3,759,000
1921-22 . . . . .	10,681,000	-6,067,000
1922-23 . . . . .	18,174,000	+779,000

\* i.e., Gross traffic receipts less working expenses.

† i.e., Gross profits less interest.

The corresponding figures for railways other than State lines were as shown in the table below, which record, it will be noticed, almost uninterrupted progress throughout the decade.

TABLE No. 5.—Profits and losses earned by railways other than State lines from 1913-14 onwards.

Year.	Gross profits.*
	£
1913-14 . . . . .	2,414,667
1914-15 . . . . .	2,669,067
1915-16 . . . . .	2,462,133
1916-17 . . . . .	2,688,200
1917-18 . . . . .	2,764,200
1918-19 . . . . .	3,304,200
1919-20 . . . . .	3,273,700
1920-21 . . . . .	3,269,800
1921-22 . . . . .	3,173,100
1922-23 . . . . .	3,815,200

\* Net earnings.

The first line opened in India was from Bombay to Kalyan, a distance of 33 miles (one of three experimental railways sanctioned in 1849), but railway construction on an ambitious scale really dates from the acceptance by the Court of Directors of the East India Company of the policy

laid down in Lord Dalhousie's famous minute of 1853 advocating the construction by guaranteed companies of a series of trunk lines uniting the various provinces together and connecting the trade centres upcountry with the principal ports. By the end of 1859 eight companies with a contemplated mileage of 5,000 and an aggregate guaranteed capital of £52 millions had been floated in England, *viz.*, (i) East Indian, (ii) Great Indian Peninsula, (iii) Madras, now merged partly in the Madras and Southern Mahratta and partly in the South Indian, (iv) Bombay, Baroda and Central India, (v) Eastern Bengal, (vi) Calcutta and South Eastern, now merged in the Eastern Bengal Railway, (vii) Scinde Punjab and Delhi, now merged in the North Western and (viii) Great Southern of India (now South Indian) railways.

Each of these companies contracted with the East India Company (or Secretary of State for India) to construct and manage a specified line in return for the provision of land and the guarantee of interest varying, according to the market rate prevailing when the various contracts were made, from  $4\frac{1}{2}$  to 5 per cent on the capital outlay. Half of any surplus profit earned in any half-year was to be retained by Government to be applied to repay of advances made under its guarantee, and while the railways were held on 99-year leases, the State reserved the right to take over any line after 25 or 50 years upon terms calculated to represent the Company's interest therein, against a corresponding right of the latter to surrender and receive payment of its capital at par. Very close control was instituted by Government over the management and working of the railways constructed on these terms, which, though of great political and military value, imposed in some cases a considerable burden upon Indian revenues, as the expectations in regard to profits were not in all instances realised owing to heavy initial outlay incurred in the construction of lines on the standard gauge, uneconomical alignment and alteration of routes and more transitory causes such as the Mutiny of 1857 and the Orissa famine of 1865-67. The original policy was modified in 1862 in favour of construction under subsidy but without guarantee and with a minimum of Government interference, but this attempt to attract capital was a complete failure, and in 1869 it was decided to raise the capital required for railway construction in India by direct State agency and to make working expenditure a charge on current revenues. Simultaneously the right of pre-emption at the end of 25 years was in the case of several of the more important guaranteed lines surrendered by Government in exchange for the absolute right to half the surplus profits in any half-year. By the end of 1879 though 6,128 miles had been opened by companies and 2,175 miles by Government at an approximate cost, respectively, of £97,872,000 and £23,695,226, the Famine Commissioners appointed after the great famine of 1877-78 pointed out that construction was still 5,000 miles short of the mileage needed to secure protection of the country from the consequences of the seasonal failure and that the limit put upon the borrowing powers of the Government for railway purposes hampered progress. It was consequently decided once more to try and attract private capital under guarantee, and although the contract terms offered under the modified guarantee system were less favourable than previously, several com-

panies were formed which have since contributed materially to the development of the Indian railway system. To this period belongs the application of the same principles to railway construction in Indian States of which the pioneers were Baroda and Hyderabad.

The rulers of Indian States have grown more appreciative in recent years of the advantages of the improved railway communications within their territories, and as examples of recent construction, the Mysore-Arsikere and Bangalore-Chik-Ballapur railways in Mysore State (the latter financed by an Indian Company under a guarantee from the Mysore Darbar), and the Quilon-Trivandrum line in Travancore, which were opened in 1917-18, may be cited. Some of these railways, e.g., the Cochin-Shoranur railway, have been constructed out of accumulated State balances.

The mileage on the 31st March 1923 under the various gauges in Indian States is shown in the subjoined table.

TABLE No. 6.—*Mileage under various gauges in Indian States in March 1923.*

Gauges.	Miles.
5' 6"	917
3' 3½"	3,436
2' 6"	914
2' 0"	

The importance of feeder lines as contributory to the growth of traffic in the main lines is now fully recognised, but the revision of the existing terms (which include rebates as well as guarantees) on which the Government of India is prepared to consider offers for the construction of feeder lines with capital provided by companies floated in India or by local bodies, such as District Boards, is almost inevitable in the altered conditions governing the money market after the war, to make the concessions sufficiently attractive to prospective investors. On the 31st March 1918 proposals for the construction of an aggregate of 3,708 miles of railway in all parts of India under branch line terms, at an estimated cost of nearly 14½ millions sterling, were under consideration by the Railway Board. The option of raising part of the capital under guarantee terms and partly under rebate terms has so far been availed of in one instance only (the Mymensingh-Bhairab Bazaar railway, 104 miles long, opened in 1917-18) and the special concession offered in 1915 in the form of a provincial guarantee of 1 per cent for a limited period in supplement to the Imperial guarantee to secure the construction by branch line companies of railways in Assam has already been extended to two branch lines, namely, the Chaparmukh-Silghat and Katakhal-Lalabazaar railways; and there are before Government several other projects to which it is proposed to apply these special terms. In order to find money for their lines District Boards in Madras have for considerable time past been allowed to levy a special

railway cess and the railway properties of the Tanjore District Board afford a striking example of the financial possibilities of this system the extension of which to Bombay and Burma is in contemplation. In other provinces, *e.g.*, Bengal, there are several lines which have been built under a guarantee of minimum interest given by the District Board concerned. War conditions interfered greatly with construction work but the Salem-Suramangalam line built by the South Indian railway with funds provided by the Salem District Board was opened for traffic in 1917-18. The Tinnevely-Tiruchendur Railway financed by the Tinnevely District Board and sanctioned for construction in 1915 was not completed until 1923. The question of future financing of such railways directly from Government funds is at present under the consideration of the Government of India.

The construction and management of State railways was under the control of the Public Works Department of the Government of India until 1905, when, as the result of

**The Railway Board.** Mr. Robertson's report, a Railway Board consisting of a Chairman and two members and secretariat establishment was created to secure expert consideration of the larger problems of railway administration and finance and a more settled and continuous policy in railway construction. With effect from the 1st April, 1924, the Railway Board has been re-constituted and consists of a Chief Commissioner as President, a Financial Commissioner, and two members. The appointment of Chief Commissioner was sanctioned in November, 1922, and he is solely responsible under the Government of India for arriving at decisions on technical questions and advising the Government on matters of Railway policy. The appointment of Financial Commissioner was made in April, 1923. The reorganised constitution has been framed on the recommendations of the Chief Commissioner, which were based on the main principles underlying the report of the Railway Committee of 1921 presided over by Sir William Acworth. Briefly these principles are that the Railway Department (Railway Board) should be given such independence in carrying out its work as is compatible with its position as a Department of the Government of India, and such freedom in shaping and carrying out railway policy as will enable it to treat the railways of India as a property to be developed on commercial lines. In addition to the preparation of the railway programme, the Railway Board decides all general questions of policy and economy and settles disputes between competing interests while its administrative functions include the construction of new lines by State agency, the approval of rates for passenger and goods, the settlement of train services and through traffic arrangements, the control and promotion of the staffs of State railways and general supervision of the expenditure and working of lines in which the Government of India is principally interested. The offices of the Railway Board are in Simla from April to October and at Delhi from November to March. The companies working most of the Indian railways are sterling companies with Boards of Directors in London, who communicate with the Railway Board through the Agents of the lines in India. On these Boards a representative of the India Office holds a watching brief as Government Director.

TABLE No. 7.—Main results of working of all Indian railways treated as one system.

Particulars.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
1	2	3	4	5	6
Total capital outlay, including ferries and suspense, on open lines (in thousands of pounds). £	366,496	377,585	417,870	431,981	446,261
Gross earnings (in thousands of pounds) . . . . . £	57,524	59,435	61,325	61,924	70,435
Total working expenses (in thousands of pounds) . . . . . £	27,868	33,771	40,194	47,200	48,663
Percentage of working expenses to gross earnings . . . . . Per cent.	48.45	56.81	65.54	76.22	69.09
II Net earnings (in thousands of pounds) . . . . . £	29,657	25,664	21,131	14,725	21,771
Percentage of net earnings to total capital outlay (item 1) . . . . . Per cent.	8.09	6.80	5.06	3.41	4.88
Unit-mileage of passengers (in thousands) . . . . . Unit-miles	18,039,577	20,614,612	20,985,008	19,808,613	18,923,943
Freight ton-mileage of goods (in thousands) . . . . . Ton-miles	22,140,806	20,401,666	19,920,898	17,712,901	18,324,825
Average rate charged for carrying a ton of goods one mile . . . . . Pence	.35	.37	.38	.45	.51
Average rate charged per passenger per mile—					
First Class . . . . . Pence	1.3	1.3	1.4	1.7	2.0
Second Class . . . . . „	.59	.63	.65	.76	1.0
Intermediate Class . . . . . „	.35	.35	.36	.37	.45
Third Class . . . . . „	.24	.24	.24	.25	.29

In the foregoing table the main results of the working of all Indian railways treated as one system during the last five years are set forth, while in Appendix III will be found the principal railways with mileage open or in course of construction on the 31st March 1923 and the area and trade centres served by them.

A new route for traffic between India and Ceylon was opened in 1914 *via* Adam's Bridge, where the extension of the South Indian railway

across the island of Rameswaram to Dhanuskodi is connected by a service of turbine steamers with the Ceylon railway terminus at Talaimanaar across a 22-mile strait. The old steamship route from Colombo to Tuticorin has thus, so far as passenger traffic is concerned, been practically superseded.

The standard gauge on Indian railways is 5' 6", but in 1870, chiefly for reasons of economy, the metre gauge of 3' 3 $\frac{3}{8}$ " was adopted provisionally for certain new lines, and has since

been a permanent feature of the railway system. The trunk system will be practically complete when Burma is placed in direct railway communication with India either by the Hukong Valley; the Manipur or the coast route, though direct connections between Delhi and Karachi, Karachi and Bombay, and Raipur and Vizianagram on the broad gauge system remain to be completed.

## PART III

### A.—DEPARTMENTS CONNECTED WITH TRADE

#### The Commercial Intelligence Department.

The Commercial Intelligence Department, which came into existence in 1905 and is responsible for the collection and dissemination of commercial information, forms a convenient link between the commercial public and the Government of India. It answers trade enquiries, effects trade introductions and publishes in the *Indian Trade Journal* (the weekly organ of the Department) statistics and other information of commercial value. The Director-General is also responsible for the compilation and publication of the Annual Review of Trade and all the statistical volumes issued by the Government of India, covering not only commercial but also judicial, administrative and agricultural subjects. The Commercial Museum, which was opened in February 1916, was for financial reasons closed in December 1922, and the Department of Statistics, with effect from the same date, ceased to exist as a separate Department. Among the important publications for which the Director-General is responsible are the following annual volumes: Review of the Trade of India, Statement of the Foreign Seaborne Trade and Navigation of British India, Prices and Wages in India, Statistical Abstract for British India, Agricultural statistics, Estimates of area and yield of principal crops and tariff schedules.

The Department is, through the medium of the Indian Trade Commissioner in London, in close touch with trade developments, of interest to India, in the United Kingdom. Further, by arrangement with the Board of Trade, H. M. Trade Commissioners in the Dominions and Colonies correspond with the Director-General of Commercial Intelligence in Indian trade interests, report to him openings for Indian exports and reply to local enquiries for Indian goods and in this way much has been done to stimulate the overseas demand for Indian produce and manufactures. Sample consignments can be arranged for by the Department through firms of repute in India. Steps are also being taken to push Indian trade with Egypt, Palestine, Mesopotamia, Persia and the Far East with the assistance of consular and other British officers.

In the same building, and controlled by the Commercial Intelligence Department, is a commercial library which is open daily, free of

**Commercial Library.** •charge, to the public. It contains up-to-date books of reference on technical and scientific subjects, periodicals and reports, official and unofficial.

The *Indian Trade Journal* gives publicity to all alterations in the Customs tariffs of the United Kingdom and other countries likely to

**Indian Trade Journal.** affect Indian interests, publishes all the crop forecasts and summarises all the more important subjects dealt with in the proceedings of the different Chambers of Commerce in India.

The department specialises on overseas trade subjects and welcomes enquiries relating to Indian trade, which should be addressed to the Director-General of Commercial Intelligence, 1, Council House Street, Calcutta.

#### **The Geological Survey Department.**

The Geological Survey Department has been in existence for nearly 75 years. It was organised by Dr. Thomas Oldham, who arrived in India for the purpose in 1851. At that time there was only one other geologist on the staff, but in the course of the next 12 years, the total strength of the department was raised to 12. Thirty years later it was 13, and in 1901, 50 years after it had been founded, that, with the addition of two mining specialists, was still the sanctioned cadre. In 1906 the total staff was increased to 20, and at the end of 1922 the number rose to 30.

The activities of the department are directed mainly to the completion of a geological map of India, and to the collection and dissemination of information regarding the mineral resources of the country. The Director gives expert advice with regard to the administration of the rules for the grant of prospecting licenses and mining leases and is consulted on all questions regarding the mineral policy of India, investigations are also carried out on behalf of Provincial Governments concerning water supply, the location of dam-sites, land slips, hydro-electric sites, road-metal, building materials and other problems; the Department is responsible for the upkeep and administration of the geological section of the Indian Museum; it issues annual statistics of the output of Indian minerals and it furnishes professors and lecturers in geology for various educational institutions in India.

**Activities.** The sanctioned cadre of the department is at present: 1 Director, 6 Superintendents, 22 Assistant Superintendents, and 1 Chemist. Its headquarters are in Calcutta, but its activities extend to the whole Indian Empire and frequently beyond. The survey parties usually leave for the field in October, returning to headquarters for recess in May. Owing to the large number of applications for advice and assistance both from Government officials and from the general public, a small proportion of the staff is retained in Calcutta throughout the year; this includes the Curator of the Museum and Laboratory and the Palæontologist. Geological specimens are determined free of charge; many hundreds of such determinations, involving numerous qualitative chemical analyses, are made every year. Fire assays and quantitative work are not, as a rule, undertaken for the public, applicants being usually referred either to the Government Test House or to one or other of the numerous professional analysts in India. Information with regard to the mineral resources of the country is given freely, and the greater part of the time of the clerical staff at headquarters is occupied with replies to enquiries of this nature.

**Publications.** The Geological Survey of India issues various publications, including—

- (1) *Records*, which are published at the rate of approximately one volume of four parts per annum. The *Records* contain the Annual Report of the Department, the Annual Review of Mineral Production, and papers dealing with both scientific and economic matters. Every fifth year, one volume of the *Records* is devoted to a review of the mineral production of India during the preceding quinquennial period;
- (2) *Memoirs*, which are issued from time to time as material is available; they are chiefly descriptive, and relate to the geology and mineral resources of areas which constitute more or less well-defined stratigraphical units. They also contain papers in the nature of monographs which are not suitable for publication in the *Records*;
- (3) *Paleontologia Indica*, published also as material accumulates, and consisting of descriptions of fossils collected during the course of the operations of the Department; and
- (4) Miscellaneous publications, such as bibliographies, guides, etc., issued from time to time.

The geological collections, most of which are housed in the geological section of the Indian Museum comprise some 31,000 specimens of rocks, 12,000 of minerals, and 35,000 of fossils, of which over 14,000 are types. There are four geological galleries in the Museum—

- (a) the Mineral gallery containing a large collection of both Indian and foreign minerals, a complete collection of Indian minerals of economic value, and a representative collection of Indian rocks;
- (b) the Meteorite gallery in which is a fine collection of meteorites comprising representatives of 88 Indian and 365 foreign falls;
- (c) the Siwalik gallery containing a collection of Tertiary mammals; and
- (d) the Paleontological gallery, in which are invertebrate fossils and Gondwana plants.

The galleries are open to the public free of charge daily from 10 A.M. to 4 P.M. except the first Monday of each month on which they are reserved for Indian ladies, and Friday, on which day a fee of four annas is charged. A member of the staff of the Geological Survey is placed at the disposal of visitors on Mondays and Fridays, with the exception of the first Monday in each month, to act as a guide to the collections. Arrangements are also made for students to have ready access to them.

The library of the Geological Survey of India is probably the finest scientific library in the East; it contains more than 50,000 volumes, including a very complete set of scientific serials, most of the latter being obtained by exchange of publications with learned societies and other scientific institu-

tions. Free access to the library is allowed during office hours, and every facility is given to persons wishing to consult geological literature.

### **The Department of Mines.**

The Department of Mines in India came into existence in 1902. It is mainly responsible for the administration of two Acts, viz., the Indian

**Activities.** Mines Act (Act VIII of 1901), and the Land Acquisition Mines Act (Act XVIII of 1885).

Under the first Act it is concerned with the safety of mining employees, both in coal mines and in mines other than coal, throughout British India and Burma. Rules have been made under the Act to provide for greater safety and for effective management, and, apart from the rules, the Inspectors have powers to call upon mine owners to remedy dangers and to forbid the employment of women and children in any mine in which they consider it unsafe for them to work. The majority of any fatal accidents are inquired into and reported upon. Under the second Act, the working of which is confined to Bengal and Bihar and Orissa, the officers of the Department act as Mining advisers to the Local Government, with reference to the support which should be left under railways or to the protective works which should be carried out if such support is not given. For this purpose a considerable number of surveyors are employed. Even in provinces where the Act does not apply and where the coal under railways is reserved by Government as landlords, in the lease, the services of the Department are from time to time enlisted.

The cadre consists of one Chief Inspector, two Inspectors, one electric Inspector, and four junior Inspectors, and as more than three quarters of the work refers to the coal fields of Bengal and of

**Staff.** Bihar and Orissa, the headquarters of the Department have been, since 1909, at Dhanbad, in the district of Manbhum, in Bihar and Orissa, on the edge of the Jharia coalfield. For purposes of administration, British India and Burma are divided into two circles with one of the Inspectors in charge of each. One Inspector in charge of No. 1 Circle which includes the Jharia coalfield is stationed at Dhanbad and the other stationed at Sitarampur, in Bengal, is in charge of No. 2 Circle which includes the Raniganj coalfield. The remaining mines in Bihar and Orissa, all the mines in the Punjab and Baluchistan are in No. 1 Circle, while those in Assam, Bombay, the Central Provinces, Madras and Burma are in No. 2 Circle. Each Inspector has two junior Inspectors to assist him.

The collection annually of figures of output, labour, etc., from all the mines, and the issue of an annual report and a list of mines being worked is undertaken by the department.

The department has no concern with mines in Indian States, but more than one Durbar has asked at various times for the services of an officer in a consulting capacity.

The department is closely associated with mining education. The Chief Inspector is a member of the governing body of Sibpur College, and President of a board known as the Mining Education Advisory Board under which mining instruction is given in the coalfields of Bengal and

of Bihar and Orissa. The two Inspectors are members of this board and each is the Chairman of sub-committees on the coalfields. The Chief Inspector is Chairman and both Inspectors are members of a technical Committee appointed recently to investigate the danger of explosions of coal dust in Indian coal mines. Large scale experiments are being made at Dhanbad whilst the laboratory work is being done at the Alipur Test House.

#### **The Patent Office.**

The law and procedure in India for the protection of inventions and registration of designs closely follows that in the United Kingdom, the only difference of importance being that, in the absence of any legal provision for the registration of Trade Marks, India cannot become a party to the International Convention for the protection of industrial property, under which certain rights of priority are obtainable in other countries. The reciprocal arrangement with the United Kingdom and other parts of His Majesty's Dominions affords, however, a partial substitute.

The Indian Patents and Designs Act, 1911, is in force in British India only (*i.e.*, not in Indian States) and patents granted under it are not valid in the United Kingdom or any of the British Possessions; nor does this Act permit the registration of trade and property marks or names.

The officer who administers this Act is designated the Controller of Patents and Designs. His office is at 1, Council House Street, Calcutta, and all communications relating to applications for patents and the registration of designs should be addressed to him. The Patent Office Handbook (price, one rupee) contains the Acts, rules and instructions.

The Patent Office does not undertake to give opinions on the interpretation of patent law or on the advisability of protecting inventions and designs or on their infringement or to recommend any particular agent or assist in the disposal of inventions. Trade and property marks are not registered.

#### **The Customs Department.**

The Customs Department is controlled by the Central Board of Revenue, attached to the Government of India in the Finance Department. The administration of the Department is in the hands of the Imperial Customs Service, partly recruited in India and partly in England. The Collectors of the five principal ports, Calcutta, Bombay, Madras, Rangoon and Karachi, are appointed from this service, as are the Assistant Collectors at these ports and at Chittagong. Three of the Collectorates are usually reserved for members of the Indian Civil Service temporarily attached to the Imperial Customs Service and two for members of the Imperial Customs Service proper. The subordinate staff at all Custom Houses is appointed locally. At the principal ports the staff consists of Appraisers and Preventive Officers in addition to clerical establishment. For Customs purposes Aden is not a part of British India.

In the Madras Presidency there are a number of minor ports, some of quite considerable importance, subject to the general control of the Collector of Customs at the Presidency town. For the purposes of further control, the littoral is divided up into circles placed in charge of Inspectors of Customs. The staff of the Customs Department in Madras is one with that of the Salt Department, and appointments, transfers, and questions of departmental administration are controlled by the Local Government, which is still in charge of the Salt Department; but it is anticipated that before long the Salt Department will also be placed directly under the Central Board of Revenue. The minor ports in Burma are similarly subject to the control of the Chief Collector of Customs, Rangoon. As in Madras, the Chief Collector is expected to inspect annually each minor port. The ports in Orissa are staffed by provincial officers and controlled by the Government of Bihar and Orissa, and the foreign trade is negligible. The control of the minor ports in the Bombay Presidency vests in the Collector of Salt Revenue, who, as in Madras, is still subject to the Local Government; while the only two ports open to foreign trade in Sind are under the jurisdiction of the Chief Collector of Customs, Karachi. There is no port in Kathiawar open to foreign trade.

The Customs revenue in India is derived mainly from general import duties which are levied for fiscal purposes and not for the protection of Indian industries. Special import duties are imposed on certain classes of goods, such as arms and ammunition, salt, liquors, saccharine, sugar, petroleum and tobacco and export duties on rice, tea, jute, raw and manufactured, and hides and skins. The general import duty which was raised to 20 per cent after the Mutiny, had been reduced to 5 per cent in 1875, and in 1882 was, except for a few special articles, *viz.*, arms and ammunition, liquors, opium and salt, abolished. Until 1860 there was a general export duty of 3 per cent *ad valorem*, but by 1875 it was only applicable to oil, rice, indigo and lac. The duty on wheat was abolished in 1873, and the duties on indigo and lac were remitted in 1880, leaving rice as the principal duty-paying export. In addition to import duties at the ports, there existed a wide-spread system of internal duties not only on the frontiers of Indian States, but even in British territory. A great barrier, known as the Inland Customs line, stretched from the Indus almost to the Bay of Bengal and was elaborately patrolled, the principal justification being the difference in the rate of salt duty in different parts of the country. But the barrier was also employed to tax sugar. The imposition of a uniform salt duty on the acquisition of the salt sources in Rajputana led to the abandonment of the Inland Customs line in 1879. In 1888 an import duty on petroleum was imposed and in 1894 when the depreciation of the rupee rendered additional taxation necessary the idea of a general import duty was revived, the rate being until 1916, 5 per cent *ad valorem*. Cotton was at first exempt when the general duties were again levied, but in December 1894, a 5 per cent *ad valorem* duty was imposed on imported cotton goods and yarn, while an excise duty of 5 per cent was imposed on all yarn of counts above 20 spun in power

spills in British India. In February 1896 the cotton duties were again revised, cotton yarn and thread imported or manufactured in India being made free from duty while a uniform  $3\frac{1}{2}$  per cent *ad valorem* rate was imposed on all woven cotton goods imported or manufactured in Indian power mills, the products of Indian handlooms being exempted. In 1910-11 the Government, to make good the deficit anticipated from the gradual extinction of the opium trade, raised the duty on silver from 5 per cent *ad valorem* to 4 annas (4d.) per ounce and the duties on tobacco, wine and beer were also increased. Machinery to be worked by manual or animal labour, railway material, gold, food grains, coal, raw cotton, raw wool, cotton twist and yarn, sewing and darning thread, printing materials, and books but not paper were, under the tariff in force until 1916, free of duty.

With effect from the 1st March 1916 the tariff schedules were completely recast in order to provide additional revenue to meet the financial disturbances set up by the war. The general tariff rate on imported articles was raised from 5 to  $7\frac{1}{2}$  per cent and export duties imposed on raw and manufactured jute and tea, but the duties on cotton manufactures and silver were not increased. The special duties already in force for salt, liquors, cigars and cigarettes, arms and ammunition and petroleum were enhanced, while the following articles were added to the list of goods liable to duty at special rates—sugar and silver manufactures, 10 per cent, coal 8 annas per ton, and manufactured tobacco, 50 per cent. Iron and steel machinery except for cotton spinning and weaving, railway material, and certain other items (previously on the free list) were charged at  $2\frac{1}{2}$  per cent but books, gold, living animals, raw cotton, raw wool, cotton spinning and weaving machinery, quinine, and certain agricultural instruments continued to be admitted free.

With effect from the 1st March 1917, the policy in force since 1894 was departed from, the import duty on cotton manufactures being enhanced to  $7\frac{1}{2}$  per cent without any corresponding alteration in the excise duty upon the product of Indian power looms which remains at  $3\frac{1}{2}$  per cent. An import duty on petrol of six annas per gallon with an equivalent excise duty upon the products of the Burma and Assam oil fields was also imposed for the first time. From the 1st March 1921 by the amendment of the second schedule to the Indian Tariff Act, 1894, which was embodied in the Indian Finance Act, 1921, the general *ad valorem* tariff rate on imported articles was raised from  $7\frac{1}{2}$  to 11 per cent, a specific rate of duty of 12 annas per gross of boxes was imposed on matches, and a duty of 20 per cent levied on certain articles of luxury such as confectionery, motor cars, etc. The special rates of duty on imported liquors, foreign sugar, and tobacco, other than unmanufactured tobacco, were increased. Cotton machinery, hitherto free, was brought under the  $2\frac{1}{2}$  per cent rate and metallic ores of all sorts were made free. By the Indian Finance Act of 1922, further amending the second schedule to the Indian Tariff Act, the general *ad valorem* rate on imported articles was raised to 15 per cent; the specific rate of duty on matches was fixed at (1) Re. 1-8 per gross of boxes, in boxes

containing on the average not more than 100 matches, and (2) six annas for every 25 matches or fraction thereof in each box, per gross of boxes, in boxes containing on the average more than 100 matches; and the duty on luxury articles was increased to 30 per cent. The special rate of duty on foreign sugar was raised from 15 to 25 per cent. Further amendments were made in the Indian Tariff Act, 1894, by the Indian Finance Act of 1923, and specific duties were imposed on saccharine and saccharine tablets. Under the Indian Finance Act of 1924 specific duties of 4½ annas per pound and six annas per pound have been imposed, respectively, on undipped splints such as are ordinarily used for match making and veneers such as are ordinarily used for making match boxes, including boxes and parts of boxes made of such veneers. For a number of articles chargeable with duty a tariff valuation is fixed, which is revised once a year, the tariff schedules as amended appearing generally in the third week of December and coming into force from the 1st January. In March 1917, the export duties on jute were doubled and now stand at Rs. 4½ for raw jute per bale of 400 lbs. with a special rate of Re. 1½ for cuttings, and for manufactured jute, Rs. 20 per ton for sacking goods and Rs. 32 per ton for hessians. The export duty on tea is Rs. 1½ per 100 lbs. With effect from the 11th September 1919 an export duty was imposed on all exports of untanned hides and skins of 15 per cent *ad valorem* with a rebate of 10 per cent on shipments to the United Kingdom, British Possessions and mandatory territories, but by the Indian Finance Act of 1923 the duty on shipments to all countries has been reduced to 5 per cent.

The taxation of salt is a legacy from the Moghuls. The excise duty levied on salt manufactured by solar evaporation with the import duty on foreign salt has always furnished a considerable revenue. The rate of duty which is identical is lowered or raised according to fiscal exigencies. At the present time it is Re. 1-4 per maund equivalent to about a farthing a lb. In addition there are large supplies of lake salt and of rock salt mined by Government agency.

About half the indigenous salt is manufactured or mined by Government agency and half under license and excise. The imports usually represent about one-fourth of the total annual consumption (1,812,000 tons). The rate of duty has varied from time to time. From 1888 to 1903 it was Rs. 2-8 (3s. 4d.) per maund of 82½ lbs. (except in Burma which enjoyed a privileged rate) but thereafter was gradually reduced to Re. 1 (1s. 4d.) in 1907. In 1916 the rate was raised to Re. 1-4 (1s. 8d.) and from the 1st March 1923 to Rs. 2-8 (3s. 4d.). The current rate, as has already been stated, is Re. 1-4 (1s. 8d.) only. Though the collection of import duty is effected through the various Customs Houses, the amounts so received are credited to a separate head.

The Customs revenue collected at the six principal ports and the all-India totals for the five years 1918-19 to 1922-23 are given in the table below. The totals for 1913-14 for all ports were £6,246,348 (imports) and £858,432 (exports).

TABLE No. 8.—*Customs revenue collected at the six principal ports and totals for British India from 1918-19 (excluding salt).*

Ports.	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.	
	Import duty.	Export duty.	Import duty.	Export duty.	Import duty.	Export duty.	Import duty.	Export duty.	Import duty.	Export duty.
	£	£	£	£	£	£	£	£	£	£
Calcutta . . . . .	3,294,153	1,678,020	4,003,293	2,597,114	6,280,171	2,562,047	7,308,530	2,255,847	7,742,528	2,690,875
Bombay . . . . .	3,133,352	70,604	3,619,916	118,709	5,725,617	68,425	6,219,662	42,684	8,193,914	62,308
Madras . . . . .	505,401	1,358	576,679	32,361	968,935	27,439	1,052,178	30,124	1,601,348	21,705
Rangoon . . . . .	644,383	447,974	811,639	171,660	1,495,716	279,138	1,484,744	400,243	2,154,987	493,242
Karachi . . . . .	710,249	22,011	954,337	113,007	1,664,685	95,088	2,349,044	80,305	2,402,377	57,374
Chittagong . . . . .	5,318	60,781	10,863	129,983	25,482	83,258	33,384	71,840	41,496	96,079
<b>TOTAL FOR ALL INDIA</b>	<b>8,395,767</b>	<b>2,460,995</b>	<b>10,305,771</b>	<b>3,207,417</b>	<b>15,528,207</b>	<b>3,224,601</b>	<b>18,478,970</b>	<b>3,000,822</b>	<b>22,453,309</b>	<b>3,495,423</b>

### **The Indian Stores Department.**

The Indian Stores Department is the outcome of the recommendations of the Stores Purchase Committee, and was constituted in January 1922. Its main function is to purchase in India in accordance with the Stores Purchase rules, stores of all descriptions, except lethal munitions, coal, coke, stationery and a few other classes of articles, for the Departments of the Central Government and the minor Local Governments. Its services are also available to such major Local Governments, Indian States, public bodies, etc., as may desire to avail themselves of those services. The Department consists at present of the office of the Chief Controller of Stores, which is located at the headquarters of the Government of India, and of inspection agencies at Calcutta, Jamshedpur and Karachi. The principal officers of the Department are the Chief Controller of Stores, the Director of Inspection and the Director of Purchase and Intelligence. The inspection agencies consist of (i) a circle of inspection at Calcutta, with branches at Asansol and Kulti, under the control of an officer, styled the Controller of Inspection, Calcutta circle, and (ii) of the Government Test House situated at Alipore. The inspection circle undertakes the inspection not only of finished articles but also of stores throughout the process of manufacture in cases where manufacture is carried out in Calcutta and its neighbourhood. For this purpose an expert staff of Inspectors and Examiners is employed in the circle. At the Government Test House are undertaken physical and chemical tests and also analyses of various descriptions of stores. This organization is fully equipped with an expert staff and with up-to-date machinery and appliances. The organization at Jamshedpur is known as the Metallurgical Inspectorate, and is in charge of an officer designated the Metallurgical Inspector who is assisted by a staff of expert metallurgists. Its function is to inspect throughout the process of manufacture mainly the products of the Tata Iron and Steel Company Ltd., but it also carries out such other tests and inspections of metals as fall within its scope. The organization at Karachi has been lately constituted, and is under the control of an officer designated the Inspector-in-charge. Its functions are similar to those of the Calcutta Circle of Inspection. Sanction has recently been received for an expansion of the staff of the Department, and during the course of the year 1924-25 purchasing agencies will be established at Calcutta and Bombay and inspection agencies at Bombay, Madras and, possibly, Cawnpore. All requests for purchase are made by means of indents drawn up on special forms prescribed by the Department and are submitted to the Chief Controller of Stores. For all orders of Rs. 5,000 and upwards, tenders are usually invited by means of advertisements. For orders below Rs. 5,000, tenders are ordinarily invited only from known and reliable firms who are on the approved list of contractors. Purchases made by the Department are not completed until the articles have been subjected to a very rigid and thorough inspection. The Department is also prepared to undertake inspection in cases where purchases are made by another authority. Calls for inspection in such cases are submitted to the Chief Controller of Stores. For its services a departmental charge of 2 per cent of the value of the articles purchased is made in cases

in which the Department undertakes both purchase and inspection. In cases where the Department carries out inspection only, the charge is limited to 1 per cent of the value of the articles inspected. In connection with the purchasing arrangements, the Department is building up an intelligence bureau for the acquisition and dissemination of up-to-date and reliable information regarding sources of supply, markets, prices, etc. In this connection it scrutinizes indents placed by departments on the Director-General, India Store Department, London, and places, whenever possible, consumers in touch with Indian sources of supply. A scheme of organization for the Department has been approved by the Secretary of State for India, and the Department will be further expanded as necessity arises and the financial situation of the country permits.

The purchasing activities of this Department are at present confined to the Indian markets and they are controlled by the provisions of the Stores Purchase rules. Stores not obtainable in India in accordance with those rules are to be obtained direct by the indenting departments from the Director-General, India Store Department, London. The Indian Stores Department and the India Store Department, London, are at present entirely distinct organizations and function independently of each other.

## B. MISCELLANEOUS ITEMS OF LAW AND PRACTICE AFFECTING TRADE

### Merchandise Marks.

Importers into India, especially from countries other than the United Kingdom, would do well to make themselves acquainted with the law and regulations relating to merchandise marks. In Appendix II will be found the principal provisions of the Indian Merchandise Marks Act, 1889, and connected Acts and the notifications issued thereunder. The following summary of the regulations in force does not claim to be exhaustive. For those seeking more complete information a reference is suggested to the Merchandise Marks Manual which is published under the authority of the Government of India and obtainable of all agents for the sale of Indian Government publications.

Infringements or offences may be classified conveniently under four heads—

- (1) Counterfeit trade marks,
- (2) Trade descriptions that are false in respect of the country of origin,
- (3) Trade descriptions that are false in other respects, and
- (4) Lengths not properly stamped on piecegoods.

The provisions regarding counterfeit trade marks do not cover general get up but do extend to other marks or combination of marks, the imitation of which is reasonably calculated to lead persons to believe that the goods are the manufacture of some person other than they really are, *e.g.*, piecegoods are identified in the bazaar by their labels

or by the manufacturer's or importer's number impressed upon them or the merchandise of a particular firm may be known by the firm's name or initials which form no part of the trade mark. These provisions are intended not only to protect manufacturers against piracy, but the general public from being supplied with goods of inferior or unknown quality under cover of a well known brand. If notice of such infringement is given beforehand by the aggrieved party to the Customs authorities, the goods on arrival are detained, if there is reasonable justification, pending (1) execution of an indemnity bond within 24 hours and (2) institution of proper legal proceedings within a month. *Bona fide* applications made in the absence of definite information for a watch of possible infringements are usually granted for a period of 3 months renewable on reasonable grounds. But formal registration of marks, etc., by Customs officers is prohibited. If in the course of the ordinary Customs examination an infringement is discovered, intimation is sent to the person whose mark is infringed to enable him to proceed as indicated above, but the goods are released if he fails to take preliminary action within a period of 4 days.

It is not necessary to mark the country of origin on any goods imported into India, except where the goods bear some other mark

(2) Trade description false in respect of country of origin.

or indication which is held under the regulations to constitute a false trade description with regard to origin, in the absence of any counter-indication of the real country of origin, e.g.,

Scotch whisky or Jamaica rum, if the produce of Holland. Similarly cognac and sherry require respectively the specific counter-indications 'Not made in France,' 'Not made in Spain,' if not the produce of those countries. The commonest class of cases falling under this description is where the goods bear a mark or label with English words (most frequently the words 'trade mark'), the use of the English language being taken to indicate that the goods are the product of the United Kingdom or British India, and therefore to constitute a false trade description unless corrected by a definite indication of the country of origin (such as 'Made in France') or an indication negating the implication to be drawn from the use of the English language, such as 'Made Abroad,' 'Not made in the United Kingdom or British India,' 'Foreign Made' or 'Foreign Produce.' When the name used is the name of a place in the United Kingdom or British India a counter-indication is required, e.g., the word 'Boston' requires, in the case of American goods, the counter-indication U. S. A., but 'Made in New York or Philadelphia' does not. The use of the English language on foreign made goods is admissible as part of the goods themselves, e.g., the word 'Stamps' or 'Photographs' on albums but not expressions such as 'A present for a good boy' or 'Superior quality.' A consignment of spelter bearing the words 'Extra pure' on the top of the slabs without counter-indication of country of origin, viz., Japan, which was stamped on the reverse with a rubber stamp, was held liable to penalty.

In the case of goods made or produced in a foreign country, the trade description indicative of origin in the United Kingdom or British India which has been corrected by the use of such an expression as 'Made

Abroad' may still be false, if it also suggests that the goods were manufactured in a foreign country other than the actual country of origin (e.g., scents made in Japan bearing the word 'parfumerie'). The counter-indication, which should be such as to negative both these implications, must either specify the actual country of origin or must run, 'Not made in United Kingdom or British India or X' (X being the other foreign country in which the goods might wrongly be supposed to have been manufactured). Similarly the use in a trade description of the language of one foreign country on goods produced in another requires counter-indication of the latter. English manufacturers using French expressions on their goods were ordered to attach a prominent and permanent label 'Made in England' on the offending goods.

When the misleading words or marks consist of what is or purports to be the name or trade mark of a manufacturer, dealer or trader in the United Kingdom or British India, a specific and distinct counter-indication of the country of origin is necessary, e.g., pen-holders of German manufacture bearing the name of a British Indian trader without the country of origin were ordered to be reshipped. Initials are not however treated as names requiring a counter-indication unless they are likely to suggest the name of a British manufacturer; and an exception is made in the case of coverings or labels made in a foreign country but bearing the name of a British Indian manufacturer or dealer who has imported the coverings or labels for his own goods. Goods made or produced in a foreign country but bearing the name or trade mark of a British Indian dealer or a trade description consisting of Indian vernaculars or numerals or pictorial representations such as Indian deities or emblems must bear a counter-indication which is however waived in the case of goods manufactured in the United Kingdom unless in the latter case there is good ground for considering that the marking conveys the impression of Indian origin. A penalty was imposed in lieu of correct-stamping on safety matches made in Sweden bearing the word *Om* in Bengali but without any indication of the country of origin.

*Dhooties* of English manufacture with the words *Bande Mataram* in Bengali woven along the whole borders with the words 'Manchester' stamped in Bengali only in one place were confiscated subject to redemption and reshipment on payment of a penalty and this decision was upheld in appeal.

It is important to note that whenever an indication of the country of origin is required under the regulations, such indication should be (1) in the same language and character as the name or trade mark or trade description, (2) sufficiently conspicuous and indelible and (3) should be repeated for each application of the mark or description in such a manner that it cannot be removed afterwards.

Other false trade descriptions are frequently found on goods in respect of (a) their number, quantity, measure, gauge or weight, or (b) the material of which they are composed.

The cases under (a) usually affect (1) woollen and cotton goods in respect of their measure, size or weight, and (2) packages, boxes or

cartons bearing incorrect indications in respect of the quantities contained in them.

Paper wrappers of cotton braids each containing twelve skeins were marked '6 gra. yards' implying that each skein was 72 yards long whereas the actual length of the braids varied from 44 to 51 yards. Deletion of the misleading marking was ordered under penalty.

Offences under (b) are held to be committed when the trade description suggests that the article is made of a material superior in quality and value than it really is and as such is likely to deceive the buyer. Iron nails described as 'brass nails' were passed on penalty and deletion of the word "brass."

A large number of cases under this head occur in connexion with consignments of white zinc, white and red lead, linseed oil and turpentine which are very frequently imported adulterated. The general rule is that when the percentage of impurity exceeds 5 per cent (10 per cent in the case of turpentine) but not 50 per cent, a qualifying description such as 'adulterated' or 'reduced' is held to be sufficient, but if it exceeds 50 per cent the actual percentage should also be stated. Similarly it has been ruled that condensed milk containing less than 9 per cent of fat contravenes the regulations unless marked 'prepared from skimmed milk.'

As a general rule the Merchandise Marks Act does not require goods

(4) Lengths not properly stamped on piecegoods. to be stamped or marked, though it insists that any stamps or marks affixed should be correct, but by a special provision piecegoods

which are ordinarily sold by length or by the piece must be correctly and properly stamped with the lengths in standard yards. The stamping must be in English numerals accompanied by the word 'yards,' (abbreviation 'yds. '), though marking in inches may be permitted on cloths of small dimensions and delicate make in accordance with the custom of the trade but in all cases it should be placed conspicuously on the fabric itself so as not to be ordinarily removable. For the purposes of this regulation, piecegoods are defined as including woollen piecegoods of all kinds and certain specified descriptions of cotton goods; the provisions however do not apply to any fabric which comes within the scope of the above definition but is ordinarily sold by the unit or with reference to the number. Pieces of mosquito netting imported without the lengths stamped on them were directed to be stamped under penalty or in the alternative with an enhanced penalty in lieu of stamping.

#### Registration of Trade Marks.

There is no recognised registration of trade marks in India. The majority of the Chambers of Commerce consider that the introduction under legislative enactment of such a system would seriously affect existing rights of user between firms in India and also between firms in India and abroad. Registration of new trade marks on payment of a fee is made by the Madras and South Indian Chambers of Commerce and as evidence of the date on which the mark or ticket was registered, may be useful in subsequent litigation, though it conveys no legal rights.

The Bombay Millowners' Association keeps a register of all trade marks in use by members and has a special set of rules governing their registration to which all members upon election agree to conform, in view of the protection afforded by the Association to the trade marks and tickets used by them.

#### **Registration of Partnerships.**

The question whether the registration of business partnerships should be made compulsory has been frequently considered during the last half century. The absence of any such measure hampers materially the development of business between Indian firms and foreign constituents and also restricts the grant of financial accommodation by European banks. In 1908 the Bengal and Bombay Chambers of Commerce prepared draft bills on the subject, but their proposals being unreconcilable the Government of India was not disposed to accept either as the basis for legislation. The Indian Industrial Commission recommended that Government of India should take an early opportunity of re-examining the whole question and the conference of Associated Chambers of Commerce of India and Ceylon held in January, 1920, unanimously adopted a resolution favouring legislation to provide for registration of partnerships and registration of business names but no bill has yet been introduced. The main stumbling block to a practical solution of the problem is the joint family system.

#### **Registration of Business Names.**

Closely allied to the question of registration of partnerships is that of registration of business names for which there is at present no provision of law in India. A movement to introduce legislation on the lines of the United Kingdom Registration of Business Names Act, 1916, has been initiated by the Madras and Bengal Chambers of Commerce and a draft bill prepared by the former body is before the Government of India. The object of such legislation will be two-fold, *viz.*, to identify alien interest and by compelling disclosure of assumed names to facilitate, by rendering more precise, commercial transactions. Action would not be aimed at Indians trading under assumed European names, though disclosure of real names would be desirable in the case of Europeans trading under assumed names. Difficulties are likely to arise in the enactment of any measure relating to business names owing to the joint family system prevalent in India. The Indian Industrial Commission in the course of its sittings examined the question but the evidence placed before it did not justify it in making definite recommendations and the Government of India, as in the case of registration of partnerships, seems indisposed to legislate.

An Act making the registration of business names compulsory was passed in Burma in 1923, but the number of joint family businesses in that province is said to be negligible.

## PART IV

### COMMERCIAL ORGANISATIONS

The principal non-official organisations connected with trade are the Chambers of Commerce at Calcutta, Bombay, Madras, Rangoon and Karachi and other important centres with a membership, except in Bombay, preponderatingly European, though open to Indians also. Closely connected with these and not infrequently employing the same secretariat staff are the associations representing particular branches of trade such as jute mills, cotton mills, etc. The Trades Associations representing the retail traders in the principal cities are scarcely less important bodies, and there are other associations representing general interests of more recent growth such as the Marwari Association in Calcutta, the South Indian Chamber of Commerce in Madras and the Indian Merchants Chamber and Bureau in Bombay which are exclusively Indian in membership. These bodies, though they differ from time to time on questions of policy, are in no sense antagonistic to the older associations.

The membership of most of these bodies is confined to the province or city where their headquarters are situated, but they maintain close touch with similar organisations at other trade centres. In the case of jute, which is grown only in Bengal, the associations connected with it are representative of the entire industry.

These Associations and the leading Chambers of Commerce in particular keep the bureaucracy apprised from time to time of the problems affecting commercial development in India and, undoubtedly, perform important functions in focussing un-official opinion and representing commercial sentiment the value of which is reflected in the recognition, varying according to their status and traditions, which they enjoy at the hands of Government. The Bengal and Bombay Chambers of Commerce have the privilege of electing a representative each to the Council of State and six and two representatives respectively to the Legislative Councils of their Local Governments. The Madras Chamber elects two representatives to the Legislative Council of that Presidency, and the Rangoon Chamber a representative to the Council of State and to the Legislative Council of the Governor of Burma. The Upper India Chamber elects two representatives and the United Provinces Chamber one representative to the Legislative Council of the United Provinces. The Karachi Chamber of Commerce elects a representative to the Bombay Legislative Council. The Calcutta, Bombay, Madras and Rangoon Trades Associations also elect a representative each to the local Councils. These representatives being non-officials enjoy complete freedom of attitude with regard to any legislation or

subject of debate which may come before the councils. The Chambers are also represented in *quasi*-Government institutions such as Port Commissions while seats are reserved for them on the Improvement Trusts of Calcutta and Bombay and on Municipal Corporations. It is usual for both the Imperial and Provincial Governments to obtain the views of the leading Chambers and commercial associations before embarking upon measures which, howsoever remotely, are likely to affect trade, and every consideration is given to any advice tendered.

The London Chamber of Commerce opened in 1912 an East India Section specially charged with the advocacy in the United Kingdom of questions of commercial interest in India.

The constitution and aims of the principal associations are separately treated in the following paragraphs.

#### A.—General.

The organisation styled the Associated Chambers of Commerce of India and Ceylon was established at a conference of representatives of the Chambers which was held in Calcutta on the 8th and 9th January 1920. The first attempt at concerted action by the Chambers was made in 1905 when a conference was held at Calcutta. No further step in the same direction was, however, taken until 1917, when a conference was held at Delhi to consider the question of Indian trade after the war. But meanwhile the need for an organisation had made itself felt from time to time, and after the war it was considered that the time had come when European commercial interests throughout India ought to be more closely organised. It was accordingly decided, at the conference on the 8th and 9th January 1920, to constitute an Association having for its main objects the promotion and protection of the trade, commerce, industries and manufactures of India and Ceylon. The Association at the present time consists of the following fifteen Chambers namely,—Bengal, Bombay, Burma, Calicut, Ceylon, Chittagong, Cooch-nada, Cochin, Karachi, Madras, Narayanganj, Punjab, Upper India, Tellicherry and Tuticorin.

The Association was incorporated in 1920 under the provisions of article 26 of the Indian Companies Act. Its principal work is the organising of an annual meeting of its members at which commercial and industrial questions are discussed and suitable resolutions adopted. The conference of January 1920, to which reference has been already made, was the first of these gatherings. The second was held in Calcutta in January 1921, the third in Calcutta in January 1922, the fourth also in Calcutta in January 1923 and the fifth in Bombay in December 1923. The articles of association provide for the election of a Chamber by whom a President for the year is nominated and also of two Chambers each of whom nominates a Vice-President for the year. A Secretary

is also appointed yearly by the annual meeting. There is no Managing Committee, the executive work of the Association being conducted by the President and Secretary. For the years 1920, 1921 and 1922 the President of the Bengal Chamber was the President of the Association and the Secretary of the Bengal Chamber was the Secretary. For the year 1923 the President of the Bombay Chamber was the President, and the Secretary of the Bombay Chamber was the Secretary. For the year 1924 the Bengal Chamber was again elected to nominate the President and the Secretary of the Bengal Chamber was elected Secretary.

To indicate the extent of the activities of the Association, the subjects of some of the resolutions adopted at the last annual General Meeting in Bombay may be mentioned :—

the Indian Arbitration Act, IX of 1899 ; registration of business names and partnerships ; the currency problem ; rate of exchange for bills drawn in foreign currencies ; Railway Finance ; thefts from railway wagons ; the coal trade ; the Telegraph services ; Customs duty on Government imports ; technical education ; Government competition with private enterprise ; local purchase of stores ; storm warning reports ; the Government of India's loans policy ; proposed protection for the steel industry ; and the continuance of the export duty on hides and skins.

The Indian Jute Manufacturers' Association was constituted in 1884, the name being altered at a special general meeting in July 1902, to the 'Indian Jute Mills Association,' when the rules of the association, as they now exist, were passed.

**Indian Jute Mills  
Association, Calcutta.**

The Association started with a membership of 19 which has risen to 52. The objects of the Association are to encourage and secure united feeling and action, to collect and classify facts and statistics, to open out new markets, if practicable, to fix points of custom, to standardize contracts, to obtain the removal of grievances, to arbitrate on matters of dispute, to communicate with public authorities or kindred associations, generally to promote and to protect the interests of those engaged in the jute industry in all matters relating to it, especially in those touching the interests of the members of the Association, and to do all such other lawful acts as are incidental or conducive to the attainment of the above objects or any of them. All members owning or managing jute mills or holding a power of attorney to represent them in India are eligible for membership.

The Association returns two representatives to the Bengal Legislative Council.

The affairs and funds of the Association are managed by a Committee consisting of a Chairman and 4 members who are appointed annually at a general meeting. The Secretary and Assistant Secretary of the Bengal Chamber of Commerce are *ex-officio* Secretary and Assistant Secretary of the Association. The office of the Association is at the Royal Exchange, 2, Clive Street, Calcutta.

The East India Cotton Association, Limited, Bombay, was founded in 1921 to provide, regulate and maintain suitable buildings or rooms for a Cotton Exchange in the City of Bombay and elsewhere in India, to provide forms of contracts and regulate the carrying out and enforcement or cancellation of contracts, to adjust controversies between persons engaged in the cotton trade, to establish just and equitable principles in the said trade, to maintain uniformity in rules, regulations and usages of the said trade, to fix or adopt standards of classification in the same, to acquire, preserve and disseminate useful information connected with the cotton interest throughout all markets, to decrease the local risk attendant upon business, and generally to promote the cotton trade throughout India, increase its amount and augment the facilities with which it may be conducted; to establish, regulate and maintain a clearing house for the purpose of dealing with cotton and transactions therein; to prescribe the principle of framing of contracts with a view to eliminate the temptation and possibility of speculative manipulation; and to make from time to time bye-laws, rules and regulations respecting the cotton trade, etc.

The affairs of the Association are managed by a Board of Directors, a General Manager, a Clearing House Manager and a Secretary.

Upon the establishment of the East India Cotton Association, the Bombay Cotton Trade Association was wound up voluntarily.

The Indian Tea Association, Calcutta, was formed at a meeting of Calcutta tea agency firms in 1881, the objects and duty of the Association being to promote the common interests of all persons concerned in the cultivation of tea in India.

The Association started with a membership of companies and estate owners representing a planted area of over 103,000 acres, which had increased at the end of 1923 to 511,510 acres. Proprietors and managers of, and agents for, tea estates (including limited companies) are eligible for election as members, all applications being dealt with by the General Committee.

The business and funds of the Association are controlled by a General Committee consisting of 9 firms who are elected annually by the members of the Association. Each of the 9 firms elected nominates a gentleman to represent them on the General Committee, and the General Committee elect their own Chairman and Vice-Chairman. The Secretary and Assistant Secretary of the Bengal Chamber of Commerce are *ex-officio* Secretary and Assistant Secretary of the Association which was affiliated to the Chamber in May 1885.

The Association has since 1900 maintained a scientific department dealing with many and varied questions affecting tea cultivation, and undertaking the investigation of problems relating to the manufacture of tea. The European staff of this department consists of a Chief Scientific officer, an Entomologist, a Mycologist and three other Scientific officers, and the results of their investigations are published from time to time in the form of bulletins or monographs

The Association nominates one representative to the Bengal Legislative Council.

The headquarters of the Indian Tea Association are at the Royal Exchange, 2, Clive Street, Calcutta.

This Committee was constituted by the Government of India on the 31st March, 1921, to secure co-operation and co-ordination in all

**Indian Central Cotton Committee.**

matters relating to cotton, to act as an advisory body to Government and the trade, to promote the improvement of cotton growing and marketing in India and to act as a centre for the dissemination of information on these subjects. The Agricultural Adviser to the Government of India is President and the membership consists of the representatives of the various Provincial Departments of Agriculture, of Chambers of Commerce, of Commercial Associations connected with the cotton industry, of cotton growers and of cotton-growing Indian States, with the Director General of Commercial Intelligence and the Commercial nominees of the Government of Bombay, Madras, the Punjab and Bengal. The Indian Cotton Cess Act of 1923 has given the Committee incorporation as a permanent body and prescribed its constitution. All sections of the trade including spinners and manufacturers, merchants, brokers and ginners are represented on it, and it is therefore in a position to offer authoritative advice to the Government of India and Local Governments on all problems affecting the industry\*.

The Indian Mining Association (founded in 1892) was the outcome of the activities of a Mining Sub-Committee of the Bengal Chamber of Commerce. The objects of the Association

**Indian Mining Association.**

are to protect, by every legitimate means, the interests of those engaged in developing the mining industries of India, to foster those industries, to provide a ready means of arbitration for the settlement of disputes between mining proprietors and to take part in discussions affecting or having a bearing upon mines, their development or working, and for this purpose to enter into communication with the Government and other public bodies.

All persons or companies engaged in conducting mining enterprises are eligible to be members of the Association. The Committee are empowered by the rules to appoint honorary members but such members have no voting privileges. The Association originated with a membership of 13 which had increased to 142 at the close of 1923. Practically all the European and a number of Indian coal concerns in Bengal and Bihar and Orissa are members. The Association enjoys the privilege of electing a representative to each of the Legislative Councils of Bengal and of Bihar and Orissa.

The headquarters of the Association are at the Royal Exchange, 2, Clive Street, Calcutta, and its business is conducted by a Committee of seven members who appoint their own Chairman.

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\*See also page 133 (Cotton Cess Act).

This Association founded in March 1913 represents Indian capital in the Coal mining industry of Bengal and Bihar and Orissa. Out of the 754 coal mines in the Raniganj and Jharia coal fields, as many as 517 are under Indian management. On the 1st of January 1924, there were approximately 300 members on the roll.

The Federation is widely represented on various public bodies and institutions both of Bengal and Bihar and Orissa and elects a member to the Legislative Council of the latter province.

The head quarters of the Federation are at 233, Old China Bazar Street, Calcutta, with branches on the Jharia and Barakar coal fields. Its affairs are administered by an Executive Committee of 13 members assisted by a paid Secretary.

It regularly issues a monthly bulletin summarising the activities of the Committee supplemented by statistics relevant to the coal trade and the traffic position.

This Institute was founded in 1906, "to promote the study of all branches of mining, geology, metallurgy and engineering in India, with a view to disseminate the information obtained for facilitating the scientific and economic development of the mineral industries of India."

Its ordinary membership is open to persons possessing a degree or first class diploma in geology, mining, metallurgy or engineering from a recognised University or School of Science, or a first class certificate of the competency as a manager of a mine, or experience in mines, or work, or practical field work extending over certain specified periods and under certain conditions of responsibility.

Meetings for the reading and discussion of papers and excursions to mines are held at frequent intervals. The Institute publishes an annual volume of Transactions. Technical libraries are maintained for the benefit of members on the coal fields of Raniganj and Jharia. Special investigations are made from time to time.

The affairs of the Institute are administered by a President and a Council of 20 members elected annually from the general body. At the end of 1923 the membership consisted of 251 ordinary members. The headquarters of the Institute are in Calcutta while a branch organisation exists in the Central Provinces.

The Wine, Spirit and Beer Association of India was founded in 1892 with headquarters at the Royal Exchange Buildings, Calcutta, to encourage and secure united feeling and action amongst shippers and importers, to decide points of custom, to arbitrate in matters of dispute, to communicate with public bodies, authorities and kindred associations, to watch the operation of the Excise and Customs laws as they may affect the trade, and generally to promote and protect the interests of persons engaged in the wine, spirit and beer trade of India. The business and affairs of the Association are managed by a General

Committee consisting of not more than 12 firms, of which six are resident in Calcutta and are appointed annually at the general meeting held during the month of March in each year.

## B.—Provincial and Local.

### (i) CHAMBERS OF COMMERCE.

The Bengal Chamber of Commerce was founded in 1834, when Lord William Bentinck was Governor-General. Little is known of its early history. There are no records prior to 1851, when it was more or less reconstituted. For very many years it was housed in the Bengal Bonded Warehouse in Clive Street. But in 1893 the then President, Sir James Mackay (now Viscount Inchcape of Strathnaver) acquired on its behalf the premises of the New Oriental Bank Corporation in liquidation. These premises stood at the corner of Clive Street and what was known then as Old China Bazar Street, on what is reputed to have been the site of Clive's Government House, and later of the house in which Sir Philip Francis lived.

The Bank premises were utilised by the Chamber and the Royal Exchange until 1915, when they were demolished and the present Royal Exchange was erected. The establishment of a Commercial Exchange was mooted in Calcutta as far back as 1857; and in 1881 the organisation of a mercantile exchange was contemplated. But it was not until 1893, when the Oriental Bank premises were acquired, that the idea took practical shape. A mercantile exchange, which by special permission of Queen Victoria was styled the Royal Exchange, was then established as part of the Chamber. The Exchange now consists of upwards of 1000 members, and the Exchange Hall, which is a prominent feature of the new building, is used by them daily as a place of meeting for the transaction of business.

The Chamber itself was incorporated in 1893 as a public company under section 26 of the Indian Companies Acts. Prior to that time it had been an unregistered association of merchants, bankers, ship-owners, insurance companies, brokers and others engaged in commerce and industry. It now consists of 250 members and may fairly claim to be thoroughly representative of the European trade, commerce, and manufacturers of the city. It is managed by a President, a Vice-President, and a Committee of seven who are elected annually by the members, and who conduct its business in accordance with the provisions of the articles of Association. In addition to the work of the Chamber proper, as represented by this Committee, there are no fewer than 22 Commercial associations recognised by and affiliated to the Chamber, whose business is transacted by the secretariat staff of the Chamber, subject to the direction of Committees and Sub-Committees.

An important branch of the work of the Chamber is the measuring and weighing of most of the principal commodities exported from Calcutta-

For this work the Chamber has a special Department—the Licensed Measurers' Department—which has been in existence for forty years. It maintains a staff of about 110 measuring officers who measure and weigh goods chiefly in course of shipment. The measurements so recorded are used by the steamship companies as the basis upon which to calculate freights charged to exporters, and the weights are required chiefly by exporters for contract purposes. The number of packages measured during the year ended 30th June 1923, was 6,417,652, and the number of packages weighed was 10,262,892. There is also in existence in connection with the Chamber a tribunal of Arbitration for the settlement and adjustment of disputes and differences relating to trade, business, manufactures, etc. The tribunal is manned by the members of the Chamber, and proceeds in accordance with the provisions of the Indian Arbitration Act, 1889. Its awards may be filed by either party to any particular dispute in the Calcutta High Court and be made a decree of the Court. The tribunal transacts a considerable volume of business. In 1920 the number of cases instituted was 1,185 and in 1921, 1,824, but probably owing to trade depression the total fell to 968 in 1922 and again to 790 in 1923.

This Chamber, which is the premier institution of the Indian commercial community in Bengal, was founded in 1887. The principal objects of the Chamber are to aid and stimulate the development of commercial and industrial enterprise in Bengal, and to protect the interests of all persons trading therein, to promote unanimity and uniformity of practice amongst the members of the trading community and to represent their views and requirements to the authorities, and to arbitrate, when occasion arises, between parties willing to submit their differences to the decision of the Chamber. The number of members on the roll is over 200. Almost all the leading Indian commercial and industrial firms and persons in every branch of the inland and foreign trade in Bengal are members of the Chamber. A considerable portion of the joint stock capital invested in Bengal in banking, insurance, steamer services, cotton mills, etc., is also represented. The Indian Mining Federation, representing the Indian section of the coal trade, is affiliated to the Chamber.

The Chamber enjoys the privilege of electing representatives to the Legislative Assembly, the Bengal Legislative Council, the Calcutta Port Trust, the Calcutta Improvement Trust and other important bodies.

The headquarters of the Chamber are at Calcutta and its affairs are administered by a Committee consisting of 20 members in addition to the President, the Vice-President, the Honorary Treasurer and the Honorary Secretary, with the help of an Assistant Secretary.

This Chamber was established in 1900 with a view to developing and protecting the trade, commerce and manufacture of India, and in particular that of Calcutta, to consider all questions relating thereto and to oppose or promote any legislative enactments relating to commerce in general. The Chamber is generally consulted by

**Marwari Chamber of  
Commerce, Calcutta.**

Government on matters of public concern as well as on all commercial matters. It is not affiliated to any other public or commercial body but undertakes arbitration work between parties willing to abide by its decision, which under its rules, is not necessarily confined to business disputes.

The number of members on the roll is 1,500.

The Bombay Chamber of Commerce, Bombay, was founded in 1836. Its affairs are controlled by a Chairman, Deputy Chairman and Committee of seven. This Chamber has given particular attention to the publication of statistical returns and enjoys special facilities from the Custom House for their preparation. The daily issues include an arrival return and trade return, details of all import and export manifests are published twice a week and current quotations weekly, while the figures of exports and imports (principal articles) by sea, and of movements of piecegoods and yarn by rail are issued monthly. A Measurement Department is responsible for the measurement of exports in the docks prior to loading and as elsewhere one of the most important functions performed by the Chamber is that of arbitration in commercial disputes.

The Chamber elects a representative to the Council of State and two to the Bombay Legislative Council. It has one seat on the Bombay Corporation and five and one on the Port Trust and Improvement Trust, respectively. There are two classes of members of the Chamber, namely, Chamber members and Associate members. The number of members of either classes is unlimited. Every member elected previous to the 25th March, 1918, is considered a Chamber member. Every person being a British subject engaged or interested in mercantile pursuits is eligible for election either as a Chamber member or as an Associate member. Every person not being a British subject similarly engaged or interested, other than a subject of a State with which the British Empire was at war on the 25th March, 1918, is eligible for election as an Associate member only.

On the 1st January, 1924, the total membership of the Bombay Chamber of Commerce amounted to 144. Of these sixteen represent banking institutions; six, shipping agencies and companies; three, firms of solicitors; three, railway companies; six, engineers and contractors; and the remainder, firms engaged in general mercantile business.

The Indian Merchants' Chamber and Bureau, Bombay, was established in 1907 to promote and protect the trade, manufactures and commerce of India, and to secure organised action on all subjects relating to the interests of the Indian business community directly and indirectly. Eleven leading Commercial Associations of Bombay are affiliated to the Chamber, which is thus thoroughly representative of Indian commercial interests. The Chamber elects a representative each to the Indian Legislative Assembly and the Bombay Legislative Council. It also elects five representatives to the Bombay Port-Trust and one to the Bombay Municipal Corporation. It has recently taken up the

work of arbitration. It publishes quarterly an Anglo-Gujerati journal giving commercial and statistical information.

The Madras Chamber of Commerce was founded in 1836 with a view to watch and protect the interest of trade ; to receive and collect information on all matters of mercantile interest bearing upon the removal of grievances and the promotion of common good ; to communicate with authorities and with individual parties thereupon ; to receive references on matters of custom or usage in doubt or dispute, deciding on the same and recording the decision made for future reference ; and to form by that and other means a code of practice whereby the transactions of business by all engaged in it may be simplified and facilitated.

The number of members on the roll at present is fifty-two, including the leading firms in Madras, the principal banks and the two railways serving the Presidency. The South Coromandel, Cochin, Calicut and Cocanada Chambers of Commerce are affiliated to the Madras Chamber, which is itself affiliated to the British Imperial Council of Commerce, London, and is also an original member of the Associated Chambers of Commerce of India and Ceylon. The Madras Trades Association and the United Planters' Association of Southern India are represented on the Chamber by Honorary members, and Government officials interested in trade and commerce are also invited to join the Chamber from time to time in a similar capacity.

The Chamber has two seats on the Madras Legislative Council, and has in addition three seats on the Corporation of Madras and four seats on the Madras Port Trust Board. The Chamber is also represented on the Advisory Committees of the South Indian and Madras and Southern Mahratta Railways, the Madras provincial Cotton Committee, the provincial State Aid to Industries Board and the Indian Tea Cess Committee.

The Chamber undertakes arbitrations and surveys with reference to matters relating to piecegoods and yarns and general disputes. It publishes fortnightly a price current and market report, also tonnage schedules, etc., and an annual volume which contains its Proceedings for the previous year. Trade marks and tickets are registered on application and payment of a fee which differentiates against non-members, provided that no objection is raised when the proposal is circulated. No application is favourably entertained from an Indian firm trading under a European name. Though registration conveys no right which the party registering does not already possess at law, it deters in a way the use of a particular ticket or mark by an individual firm which may have evidential value in the event of subsequent litigation.

The affairs of the Chamber are conducted by a Chairman, a Vice-Chairman and a Committee of five members, with the aid of a Secretary. The representatives of the Chamber on the Madras Legislative Council are also *ex-officio* members of the Committee during their term.

of office. In addition to these there are special sub-committees, for Coal, Exports, Imports, and Skins and Hides.

The South Indian Chamber of Commerce (founded in 1909) with a membership exclusively Indian, claims to represent Indian commerce,

**South Indian Chamber  
of Commerce.**

trade, industries and banking in the city of Madras and the adjoining districts of the Presidency. The objects of the Chamber are identical with those of similar bodies and its affairs are managed by an Executive Committee of twenty-four members and a President and two Vice-Presidents. Two Honorary Secretaries are elected from among the members of the Executive Committee, and there is also a paid Assistant Secretary. There are two classes of members, resident and non-resident. The right of electing two representatives to the Madras Port Trust was accorded to the Chamber by the Madras Port Trust Act Amendment Act, 1915, and the Chamber also enjoys the privilege of electing two councillors to the Madras Corporation. The Chamber elects a representative to the Madras Legislative Council, and one to the provincial State Aid to Industries Board. The Chamber registers trade marks, surveys goods and undertakes arbitration of disputes. There are about 230 members now on the rolls.

The Cocanada Chamber of Commerce, established in 1868, has no branches, but more or less represents the European mercantile

**Cocanada Chamber  
of Commerce.**

community of the north-east coast of the Madras Presidency carrying on business in Cocanada and in other parts of the districts of Godavari, Kistna, Vizagapatam and Ganjam. It is managed by a Committee consisting of a Chairman and two members, appoints arbitrators and conducts, surveys and publishes annually a report of the proceedings of the Chamber and statistical information regarding the trade of Cocanada port.

This Chamber, formerly called the Native Chamber of Commerce, was founded in 1885. All Indian merchants engaged or interested in mercan-

**Godavari Chamber of  
Commerce, Cocanada.**

tile pursuits and disposed to aid in carrying into effect the objects of the Chamber are eligible for membership. The Chamber undertakes the survey of goods and publishes a fortnightly price current.

The Chamber enjoys the privilege of electing three members to the Cocanada Port Conservancy Board.

The Tuticorin Chamber of Commerce, founded in 1906, has no branches, but represents the European mercantile community of

**Tuticorin Chamber of  
Commerce.**

Tuticorin and neighbourhood. The affairs of the Chamber are managed by a Committee of three members, one of whom is the Chairman, the executive work being in the hands of the Secretary. The Chamber appoints arbitrators, and collects and classifies, for inclusion in an annual report, statistical and commercial information bearing on the trade interests of the port.

The Cochin Chamber of Commerce (founded in 1857) has no branches but used until recently more or less to represent the European mercantile

**Cochin Chamber of Commerce.** community of the West Coast from Mangalore to Quilon. It is managed by a Chairman, an Honorary Secretary, and a Committee, appoints arbitrators, and publishes annually a report containing statistical information regarding the trade of the Malabar ports generally.

This chamber was founded in 1923 to promote foster and protect the commerce of the port of Calicut and the mercantile interests of the Malabar coast. Its affairs are managed by an executive committee consisting of a Chairman, two members and an Honorary Secretary.

All European firms or individuals engaged in mercantile pursuits in Tellicherry are eligible for membership of the local Chamber of Commerce. Its affairs are managed by an Honorary Secretary under the general supervision of the members. It is one of the Associated Chambers of Commerce of India and Ceylon.

**South Coromandel Chamber of Commerce, Cuddalore.** The South Coromandel Chamber of Commerce was founded in 1912 and has no branches but is affiliated to the Madras Chamber of Commerce. The Chamber represents the European mercantile community of South Arcot and Tanjore districts, and the ports of Cuddalore, Porto Novo and Negapatam.

The affairs of the Chamber are managed by a standing committee consisting of a Chairman and Honorary Secretary, and three other original members, the executive work being in the hands of the Secretary. The Chamber appoints arbitrators and collects information bearing on the trade interests of the ports with which it is connected.

The Karachi Chamber of Commerce, founded in 1860 on lines similar to those of Bombay, has for its objects the promotion and protection of

**Karachi Chamber of Commerce.** the general mercantile interest of the province of Sind, 'to communicate with the public authorities, with similar associations, in other

places and with individuals on all subjects of general mercantile interest,' to collect and classify commercial information and to receive and decide references on matters of usage and custom in dispute. Its affairs are managed by a Chairman, a Vice-Chairman, and a Committee of eight elected annually. The Chamber elects a representative to the Bombay Legislative Council and three representatives on the Karachi Port Trust. The number of members on the roll is 66, and there are seven honorary members.

The Chamber undertakes to nominate European arbitrators for the settlement of disputes as to the quality or condition of merchandise and appoints a public measurer to measure pressed bales of cotton, wool, hemp, hides and other merchandise at the port. It also publishes weekly a price current and market report.

**Chittagong Chamber of Commerce.** The Chittagong Chamber of Commerce was founded in 1906 to represent the commercial interests of the European and Indian communities in Eastern Bengal. Its membership includes also the Surma Valley and Assam branches of the Indian Tea Association. The Chamber

elects two members to the Chittagong Port Trust and is represented on the local Municipality.

When requested by the parties, the Chamber appoints arbitrators for the settlement of commercial disputes.

The Upper India Chamber of Commerce, Cawnpore, was inaugurated in September 1888 and the first general meeting took place in January 1889.

The chief aims and duties of the Chamber are to promote and protect the general commercial and industrial interests of the United Provinces of Agra and Oudh, to encourage friendly feelings and unanimity among manufacturers and merchants on all subjects involving their common good, to act as a medium of communication with Government and to receive references from and to arbitrate between parties willing to abide by the decision of the Chamber.

The Chamber began with a membership of 22 which has now increased to 77. Among the members are included all the railways serving these provinces, the principal banks, and, save for a few small ginning and flour and similar mills, all the power-driven industries of the United Provinces and some in the adjoining provinces. The major portion of the joint stock capital invested in Agra and Oudh is represented on the Chamber and in addition there is a considerable individual membership. It is affiliated to the British Imperial Council of Commerce and to the International Federation of Master Cotton Spinners and Manufacturers' Associations, and returns two members to the United Provinces Legislative Council. It is also represented on the Provincial Board of Industries, the Provincial Board of Agriculture, the Cawnpore Municipal Board, the Central and Provincial Cotton Committees, the Provincial Board of Loan Commissioners and the Advisory Committees of the various Railways of the Province. The Chamber maintains a tribunal of arbitration and a commercial survey which are freely availed of.

The headquarters of the Chamber are at Cawnpore and its affairs are administered by a Committee of ten, including a President and a Vice-President.

The United Provinces Chamber of Commerce (founded in 1914) is purely Indian in membership and is intended to protect the interests of Indians engaged in trade or industry in Agra and Oudh.

The Punjab Chamber of Commerce, Delhi (founded in 1905), with local committees at Amritsar and Lahore, is concerned with the trade and manufactures of the North-West Frontier Province and Kashmir as well as of the Punjab. The Chamber shares with the Punjab Trades Association the seat allotted to the representation of Commerce in the Punjab Legislative Council.

The Burma Chamber of Commerce is an association of merchants, bankers and shipping concerns, banded together to protect their several interests. It was first established in 1853, but its activities were somewhat desultory until 1877 when trade was confronted with so many

difficulties with regard to trade with Upper Burma and various export and import problems that a public meeting was held to secure a greater measure of general support. The progress of the Chamber has been continuous ever since. Its membership now comprises all the leading banks and firms in Rangoon; and to it are affiliated the Rangoon Import Association, the Burma Fire Insurance Association, the Burma Marine Insurance Agents' Association and the Burma Motor Insurance Agents' Association. It also has a court of expert surveyors and arbitrators whose duty it is to settle commercial disputes and obviate recourse to legal proceedings.

The Chamber is directly represented on the Council of State, the Burma Legislative Council, the Rangoon Port Trust, the Rangoon Corporation and the Rangoon Improvement Trust.

The headquarters of the Chamber are at 5, Shafraz Road, Rangoon, and its affairs are administered by a Committee of ten, including a Chairman and Vice-Chairman.

#### (ii) COMMERCIAL ASSOCIATIONS.

The Jute Balers' Association, established in 1909 and incorporated in 1918 under the Indian Companies Act, was founded with the object of providing facilities for Indian jute balers, shippers and traders who are not admitted to the Royal Exchange, to conduct sales, to arrange brokerage and to protect and watch over their commercial interests generally. It collects and circulates statistical information, undertakes arbitration and endeavours to secure uniformity in the rules, regulations and usages governing the jute trade.

The affairs of the Association are managed by a Committee of four members with offices situated at 102, Clive Street, Calcutta.

The Marwari Association of Calcutta is a non-political organisation, founded in 1898, with the object of promoting the social, moral and intellectual as well as the commercial well-being of the Marwari community.

The membership of the Association, numbering about 300, consists of the principal Marwari business firms in Calcutta and other prominent men of the same community. Its membership covers all the various branches of trade, both inland and foreign, in which the Marwaris are interested, and its representative character is recognised by Government, its opinion being frequently sought on matters of general public interest and on questions affecting the Marwari community in particular.

The office-bearers of the Association, who are annually elected, consist of a President, four Vice-Presidents, an Honorary Secretary, an Assistant Secretary, a Treasurer, an Auditor, a Solicitor, and fifteen Committee members.

The Calcutta Wheat and Seed Trade Association was formed in 1884 for the regulation of the Calcutta wheat and seed trade, to adjust disputes, and generally to promote and protect the interests of the trade in Calcutta. The affairs and funds of the Association are managed.

Calcutta Wheat and  
Seed Trade Association.

by a Committee of five members consisting of a Chairman and four members who are elected annually at the general meeting of the Association. The offices are in the Royal Exchange Buildings.

This Association was founded early in 1919 with the object of promoting and protecting the interests of those engaged in the hide and skin trade and of developing the trade in raw hides with the British Empire and the Allies. It also includes in its purview an examination of the best methods of flaying, preserving and curing of raw hides. Its membership includes all leading shippers in Calcutta and people upcountry shipping through Calcutta agency firms. It is affiliated to the Bengal Chamber of Commerce and its affairs are administered by a Committee consisting of a Chairman and four members, the Secretary and Assistant Secretary of the Chamber being *ex-officio* Secretary and Assistant Secretary of the Association. The offices of the Association are in the Royal Exchange Buildings.

The Bombay Millowners' Association (established in 1875) was founded with the object of protecting the interests of millowners and users of steam, water and electric power in India, and the promotion of good relations between the persons and bodies using such power.

The membership is preponderantly Indian and the affairs of the Association are managed by a Committee of twenty, including a Chairman and Deputy Chairman.

The Millowners' Association elects a representative for the Legislative Assembly alternately with the Ahmedabad Millowners' Association. It is also entitled to representation on the Legislative Council of the Governor of Bombay, Bombay Port Trust Board, City Improvement Trust, Bombay Municipal Corporation and Indian Central Cotton Committee. The Association keeps a register of all trade marks in use by members and has a special set of rules governing the registration of such trade marks. All disputes between members in connection with their trade marks have to be submitted to arbitration.

There were, on the 1st of January 1924, 94 members of the Association of which one was a silk mill, two flour mills, six ginning and pressing factories, two dye or bleach works and the remainder cotton spinning or weaving mills.

The Association prepares annually a statement showing the names of all cotton spinning and weaving mills working or in course of erection in India, their capital, the total number of spindles and looms in each, the average number of hands employed and the approximate quantity of cotton consumed, and various other monthly statistical returns showing the exports and imports of piecegoods and yarn from and into Bombay.

This Association, which was founded in the year 1881, has for its objects the promotion of friendly relationship and unity among merchants in the city of Bombay dealing in

**Bombay Native Piecegoods Merchants' Association.**

piecegoods, with a view to facilitate and protect this particular line of trade. It corresponds with public bodies on matters affecting

piecegoods trade, and also hears and decides disputes referred to it for arbitration.

The affairs of the Association are vested in a Committee composed of forty-five members. The office bearers are a Chairman, a Vice-Chairman, two Honorary Joint Secretaries, and a Treasurer.

This Association was founded in 1899 'to promote and protect the interests of merchants and to put the grain and seeds trade on a sound footing' and to receive and decide references on matters of usage and customs and form a code of practice for simplifying and facilitating business in the grain and seeds trade and to arbitrate between parties willing to refer to and abide by the judgment of the Association. It is an influential body possessing a large membership, and its affairs are administered by a Chairman, Vice-Chairman and two Secretaries and a Managing Committee of 30 members.

**Grain Merchants' Association, Bombay.**

The Ahmedabad Millowners' Association was started about 1891 with the object of protecting the interests of millowners and users of motive power of any description in Gujarat and Kathiawar and those connected with them and the promotion of good relations between the persons and bodies using such power. The Association represents the chief industrial interests in Gujarat, viz., cotton spinning and weaving, oil and match manufacturing, flour making, brick and tile making, cotton ginning and pressing, power generating, the manufacture of chemicals and drugs, foundries and brass works.

**Ahmedabad Millowners' Association.**

The affairs of the Association are managed by a Committee of ten members, including a President, Vice-President, and two Joint Honorary Secretaries. It elects a representative to serve on the Legislative Assembly of the Government of India alternately with the Bombay Millowners' Association and also elects a representative to the Bombay Legislative Council.

This Association of which the principal firm interested in the manufacture and export of lac are members came into existence in 1921 with headquarters at Calcutta. The Office bearers consist of 2 Chairman, a Deputy Chairman, and Secretary. The Association administers the proceeds on the cess on Lac.\*

The Indian Lac Association.

The Indian Sugar Producers' Association was established at Cawnpore in 1912, the first Annual General Meeting of the members being held on the 9th March 1912. The aims and objects of the Association, broadly speaking, are to ensure, as far as possible, a common policy and concerted action whenever such is called for in the interests of the sugar industry. Problems affecting the sugar industry are naturally of a special character and while, in general matters, Chambers of Commerce serve this as other industries adequately, where the interests of the grower, the manufacturer, the refiner and to some extent, of the dealer, coincide the problem is best dealt with by an independent organisation.

**Indian Sugar Producers' Association, Cawnpore.**

\* Vide page 254.

Government has recognised this and the Association can claim to have done useful work during the twelve years of its existence.

Beginning with the enrolment of 13 members it now represents 90 per cent of the white sugar manufacturers of India. The closer identification of the growers' interests with those of other producers is now one of the particular objects of the Association.

Proposals for the establishment of research work on sugarcane problems on an independent basis by the Association are now under active consideration, the sympathetic interest and assistance of Government having been ensured.

The Committee of management consists of a Chairman, Vice-Chairman and seven members. The office of the Secretary is situated at Cawnpore.

The Employers' Federation of Southern India was founded in the year 1920, its aims and intentions being to promote better feelings between employer and employee, encourage the payment of fair rates of wages, collect and classify facts and statistics, fix points of custom, standardize forms of contract, arbitrate on matters of dispute, promote and protect the mutual interests of employers and employees and particularly to safeguard employers against misguided and unfair action by employees.

All persons employing upwards of 100 employees are eligible to join the Federation.

The number of subscribers on December 31st, 1923, was 45 which included most of the principal employers in the Madras Presidency, representing approximately 39,375 employees.

The affairs of the Federation are managed by a Committee of a Chairman and 5 members, who are elected annually, the Secretary of the Madras Chamber of Commerce being *ex-officio* Secretary of the Federation.

The Federation is recognised by the Local Government, and consulted on all important matters relating to labour.

#### (iii) PLANTERS' ASSOCIATIONS.

So far back as 1801 the indigo planters of Bihar formed themselves into an association to facilitate correspondence with Government in the interests of the community, to safeguard those interests and to deal with applications for the settlement of differences between one member and another or between members and the local *zamindars* and ryots. The objects of the Association have remained much the same throughout, though the rules were remodelled in 1837 at the instance of Government and altered in 1877 and 1905.

When the successful exploitation of synthetic indigo had driven many of the planters to cultivate sugar and other crops, it was decided in 1905 to change the name of the Association to the Bihar Planters' Association.

Association, Limited. Its membership now comprises about 55 factories and it is managed by a Board of Directors, a Chairman, Vice-Chairman and a General Secretary, who are appointed yearly.

The United Planters' Association of Southern India (Incorporated) was formed as the result of a conference of different District Planters' Associations held in 1893. The first meeting took place in 1894 at Bangalore where the head office was situated until 1919, the registered office being at Madras. The chief objects for which the Association was established were to promote and protect in all parts of the world the interests of the various planting industries carried on in Southern India, the collection and dissemination of statistics and information relating to such industries, and the settlement by arbitration of disputes among its members.

United Planters'  
Association of Southern  
India, Madras.

The organisation of the Association has recently been amended, membership being of the different District Planters' Associations like those of Mysore and Wynaad and any company, firm or person who is the proprietor of an estate subscribing to a district association. In addition to a number of individual planters, the membership includes fourteen district associations. The control is in the hands of a General Committee of 28 members who work through an executive committee of five.

The activities of the Association include a Labour Department with six divisional officers and agents throughout Southern India and a Scientific department of three European agricultural experts in addition to a large subordinate Indian staff in charge of four experimental stations. It is affiliated to the London Chamber of Commerce and is represented in London by the South Indian Association. It elects an additional member to the Madras Legislative Council, and is represented on the Indian Tea Association, the Indian Tea Cess Committee, and by an Honorary member on the Chamber of Commerce, Madras.

The headquarters of the Association are now at Madras, where the *Planters' Chronicle*, the official organ of the United Planters' Association of Southern India, is edited. This paper is published weekly and is distributed free of charge to all planters in Southern India and to various scientific bodies all over the world.

There are no provincial organisations in Bengal and Assam to represent the tea-planting community outside the Indian Tea Association,

Bengal and Assam. but there are five flourishing district associations, namely, the Assam and Surma Valley branches of the India Tea Association, the Darjeeling Planters' Association, affiliated to the Indian Tea Association and the Duars and Terai Planters' Associations.

#### (\*) TRADES ASSOCIATIONS.

The chief objects of the Calcutta Trades Association which was founded in 1830 and incorporated under the Indian Companies Act,

**Calcutta Trades  
Association.**

1882, are to encourage friendly communication amongst persons engaged in business in Calcutta, especially on subjects involving their common interests, to collect and circulate statistics and other information relating to retail trade, to consider all questions connected with the trade of Calcutta, and to promote or oppose any legislative or other measures affecting such trade : and further to arbitrate in disputes between parties where the assistance of the Association in that manner is sought for.

For purposes of registration the membership of the Association which is confined to firms engaged in retail trade in Calcutta, whether the proprietorship of such firms be vested in an individual, a partnership or a joint-stock company, is declared to consist of 100.

The administration of the affairs of the Association is vested in the Master, the Deputy Master, the immediate Past Master, the Treasurer and a Committee consisting of six members elected at the annual general meeting, and six appointed by the Master. All Past Masters are also *ex-officio* members of the Committee, so long as they are members of, or are connected with, subscribing firms. The Secretary is the executive officer of the Association.

The principal officer of the Association, formerly styled President has, since 1831, been designated Master. In 1834 the Governor-General, Lord William Bentinck, acceded to a request contained in a memorial addressed to him that the Association should be recognised as a public body, with authority to address Government when they desired, and had sufficient and reasonable cause for so doing, and under subsequent administrations, the status of the Association has continued to be recognised. The Local Government has not only done the Association the honour of submitting various matters of public importance for its consideration, but has also conferred upon the members the right of nominating a representative to the Legislative Council of the province and another to the Calcutta Port Trust.

The registered office of the Association is situated at 34, Dalhousie Square, South.

This Association was founded in 1902 with the object of promoting and safeguarding the interests, general or particular of the trading community in the Bombay Presidency and also of collecting and distributing such information as may protect members of the Association from loss or damage likely to arise in whatever manner. It undertakes arbitration when called upon to do so, collects debts due to members and acts as trustees on their behalf for the liquidation, by persons indebted, of debts due to them. It keeps a watch over legislative or other measures affecting trade and, when found necessary, addresses Government in that regard. Other functions of the Association are the collection and circulation of statistical information relating to trade and the fixing of holidays to be observed by members.

The affairs of the Association are administered by the Master, the immediate Past Master, the Treasurer and Secretary, together with a

Committee of five persons (exclusive of the *ex-officio* members of the Committee) subject to the control of the Association in general meeting. The Past Masters are *ex-officio* members of the Committee so long as they are members of, or are connected with members of the Association. The present membership amounts to 42, and the offices are situated at 15, Tamarind Lane, Fort, Bombay.

The Madras Trades Association, established in 1856 and subsequently incorporated under the Indian Companies Act, was founded with the object of promoting the interest of the trading community of Madras, of furthering the adoption of a more healthy system of trade with reference to credit, and of obtaining, as far as possible, accurate information of the position and movements of those dealing with or indebted to its members. It undertakes arbitration when necessary, collects debts due to the members and generally acts as trustee for the liquidation, by persons indebted, of debts due to them. All questions relating to hours of business and the fixing of holidays are dealt with by the Association, and in addition it promotes or opposes legislative or other measures affecting trade. The present membership of the Association is 32, consisting of both European and Indian firms engaged in trade. The administration of affairs is vested in the members and is controlled by the members in general meeting, the principal officers being the Chairman, the Vice-Chairman, and the Treasurer.

The Association has the right of electing a representative to the Legislative Council of the Governor of Madras, 2 Trustees to the Madras Port Trust, and 2 Councillors to the Municipal Corporation.

The registered offices of the Association are situated at 11, Narasingapuram Mount Road, Egmore, Street, Madras.

The Rangoon Trades Association was founded in the year 1898 with the object of promoting the interests of the trading community of Rangoon and for the general adoption of a healthier system of retail trade with reference to credit. It acts as arbitrator in disputes, collects debts due to members and acts as trustee for the liquidation, by persons indebted, of debts due to members of the Association. It arranges hours of business and holidays, promotes or opposes any legislative or other measures affecting trade, and collects and circulates trade statistics. Its membership, at present numbering 36, consists of firms engaged in trade in Rangoon whether the proprietorship of such firms be vested in an individual, a partnership, or a joint-stock company. The administration of affairs rests in a President, Vice-President and Treasurer, and a Committee consisting of 6 members elected at the annual general meeting. Past Presidents are *ex-officio* members of the Committee so long as they are members of, or are connected with, subscribing firms. The Association has the right of electing a representative to the Legislative Council of the Governor of Burma, to the Port Trust, to the Development Trust, and to the Railway Advisory Committee.

The registered office of the Association is situated at No. 70, Phayre Street, Rangoon.

#### C.—Foreign.

The French Chamber of Commerce, Bombay, which is subventioned by the French Government was founded in 1921 to further and develop French trade with India. It has about 350 members and its headquarters are at the French Consulate, Bombay. The office bearers consist of a President, 2 Vice-Presidents, a Secretary and a Treasurer with the Consul for France at Bombay, and the French Commercial Attaché as Honorary Presidents. The Chamber publishes, every 2 months, a Bulletin in French with reports from all the principal markets and a copy of the current Indian Customs Tariff.

## PART V

### PRINCIPAL PORTS AND TRADE CENTRES

Though the geographical position of India is favourable for international commerce, the littoral of the peninsula is remarkably deficient in harbours to accommodate vessels of the draught now employed in the carrying trade. The west coast ports from Baluchistan to Cape Comorin, with the exception of Karachi, Bombay and Mormugao, are practically closed to traffic from the end of May to the beginning of September by the violence of the monsoon, and the east coast is surfbound and without any natural harbours, though an attempt has been made with some success to convert Madras from an open roadstead into a safe anchorage in all weathers by the construction of sea walls. Calcutta, admirably situated for trade in the rich Gangetic delta, is handicapped not by its distance from the sea but by the bars which tend to form in the Hooghly, and Chittagong, though nearer the sea, suffers in an accentuated form from a similar handicap. Burma is very similarly conditioned, Rangoon, Moulmein, Bassein and Tavoy being all on estuaries at some distance from the Bay of Bengal, and the three last-named suffer also from indifferent internal communications. As a result of these physical characteristics practically six-sevenths of India's foreign trade is concentrated in five ports, Calcutta, Bombay, Rangoon, Madras and Karachi, to name them in order of their importance, of which Bombay and Karachi alone are natural harbours.

These major ports with Chittagong are for administrative purposes placed under the control of bodies styled Port Trusts. These Trusts are composed of Commissioners partly nominated and partly elected, who, subject to the control of the Local or Imperial Government, have certain wide powers vested in them by law to levy dues and taxes in connection with the landing and shipping of goods and to utilize the amounts so realized for the betterment of the amenities of the port.

In the following pages are reviewed the principal features of the different ports beginning with Aden, and after crossing to Karachi following the coastline right round the Peninsula to the southernmost confines of Tenasserim.

### Aden.

Aden is situated on a volcanic peninsula at the junction of the gulf of the same name with the Red Sea and the Indian Ocean. Though it is under the political jurisdiction of the Government of Bombay, the Indian Sea Customs Act does not apply and imports therefrom into British India are regarded as foreign imports.

The settlement, including the island of Perim in the Red Sea, has an area of about 80 sq. miles and a population of 56,500. The port known as Steamer Point has an outer harbour giving a safe anchorage to a number of vessels, while the inner harbour is dredged to a minimum depth of 30 feet and has two berths at which steamers drawing 33 feet can lie. There are no wharves and cargoes are loaded and discharged by lighters and small boats. A metre gauge railway, constructed during the war, runs for about thirty miles into the interior.

A great deal of cargo intended for the adjacent Italian and French colonies, Abyssinia, Arabia, the Soudan, the Persian Gulf and Mombassa, is unloaded here and similarly produce from these destinations is re-consigned at Aden to destinations in Europe and Asia.

### Karachi.

The port of Karachi in the Province of Sind is situated in latitude 24° 47' North, longitude 68° 58' East, and is the nearest port in

**Situation and history.** India to Europe. For about a hundred and fifty years Karachi has been the gate of foreign commerce not only for Sind but also for a great part of North-West India, Baluchistan and Afghanistan; but the value of its trade at the time of the conquest of Sind in 1843 amounted to no more than £80,000 annually. In 1863, the value rose to £4,440,000 but this was due to a temporary cause, *viz.*, the effect of the American war on the Indian cotton market, and it was not until after direct rail communication had been established with the Punjab in 1878 that this level was again touched. Though Karachi possesses large railway workshops and three well-equipped modern flour mills, it cannot be regarded as an industrial centre, but it is of importance as the principal market and port of shipment for the surplus produce of North-Western India and as a storage depôt for the manufactures and foreign produce which the hinterland requires in exchange for the raw products sent down. The principal exports are wheat, cotton, barley, oilseeds, wool, hides and skins and animal bones (bone meal, bone dust, etc.), and the principal imports, cotton and woollen piecegoods, sugar, iron and steel, kerosene oil and coal and coke (largely on Government account for the North-Western Railway).

The present population of Karachi is 217,000. The only railway line directly serving Karachi is the North-Western Railway (broad

**Railway connections.** gauge) which runs on the right bank of the Indus to Sukkur and Quetta and on the left bank to Lahore *via* Hyderabad (Sind) and Rohri. At Hyderabad the narrow gauge Jodhpur-Bikaner Railway connects with the North-Western Railway. The interior of Sind is tapped by a few small feeder

railways on the narrow gauge constructed and managed by Messrs. Forbes, Forbes Campbell & Co. of Karachi.

The present facilities of the port include a continuous line of wharfrage 8,600 feet in length with seventeen ship berths in line, and

one coasting steamer berth completely served by railway, with ninety-seven 35-cwt., one 14-ton, and one 30-ton cranes and one 14-ton crane at a separate pier served by railway to take heavy lifts from lighters and a 30-ton floating crane. In addition there are moorings in the stream for 20 ocean-going steamers, and anchorage for innumerable country craft, apart from a boat-wharf, 1,824 feet in length, specially devoted to this trade. Other amenities include a bulk oil pier at which liquid fuel and petroleum are discharged by pipes direct into the bulk oil installations of the various oil companies, a boat basin, an export yard, a produce yard now largely used as a supplementary export yard, and an import yard.

The affairs of the port were, before the formation of a Harbour Board in 1880, managed under the orders of the Commissioner in Sind and other officers. In 1886 the Port Trust

was created by the passing of the Karachi Port Trust Act (Bombay Act VI of 1886), and the newly constituted body held its first meeting in April 1887. The Chairman, practically *ex-officio*, was the Collector of Karachi, and four of the eight members were elected by the Chamber of Commerce and Municipality and the remainder nominated by Government. In 1902 the number of Trustees was increased to eleven, and in 1909 Government agreed to the appointment of a full-time Chairman.

Since 1907, Karachi has been recognised as a first class port and is the headquarters of a Collector of the Imperial Customs Service, with three Assistant Collectors. The new offices of the Port Trust, completed early in 1916, cost about £63,750.

The value of the foreign and coasting trade of the port in private and Government merchandise and the revenue and expenditure of the Port Trust during the last quarter of a century are given in the table below.

TABLE No. 9.—Value of the trade of the port of Karachi and the revenue and expenditure of the Port Trust over a series of years.

Years.	Import.	Export.	TOTAL.	Revenue.	Expenditure.
	£	£	£	£	£
1897-98 . . . . .	5,807,159	4,848,090	10,655,179	60,261	59,856
1902-08 . . . . .	7,732,099	6,947,016	14,679,114	103,661	86,519
1907-08 . . . . .	14,440,125	7,426,422	21,866,547	219,696	176,351
1912-13 . . . . .	16,908,225	24,680,847	41,589,072	371,117	255,774
1913-14 . . . . .	17,743,844	19,782,049	37,525,893	328,729	287,045
1914-15 . . . . .	14,680,954	15,590,248	30,271,202	237,118	204,309
1915-16 . . . . .	13,846,704	15,401,851	29,248,555	229,123	200,512
1916-17 . . . . .	13,905,458	16,139,454	30,044,912	311,123	208,247
1917-18 . . . . .	15,397,713	24,559,091	39,956,804	445,131	338,898
1918-19 . . . . .	13,729,556	19,024,019	32,753,575	372,017	371,377
1919-20 . . . . .	22,380,902	19,060,923	41,441,825	288,170	243,682
1920-21 . . . . .	33,579,845	20,069,527	53,649,372	382,735	374,930
1921-22 . . . . .	25,387,165	14,598,940	39,986,105	421,225	408,516
1922-23 . . . . .	24,682,396	22,566,658	47,249,054	415,459	415,147

The deficits in 1919-20 and 1922-23 and the reduced surpluses shewn against other years are due to the general decline in trade which followed the conclusion of war, and also to the heavy additional expenditure which had to be incurred in purchasing materials at abnormal rates for repairs and renewals to plant, etc., which could not be given their usual overhaul while the war lasted. There is however every reason to anticipate that, with a revival of trade, there will be a substantial excess of revenue over expenditure in years to come.

The number of vessels (exclusive of fishing boats) entering the port in 1922-23 was 2,869 with an aggregate tonnage of 2,212,229 as compared with 2,859 with an aggregate tonnage of 2,346,617 in the previous year. Of 865 steamers entering in 1922-23 no less than 760 were British.

The debt of the Port Trust Board on the 31st March 1923 amounted in round figures to £1,902,000, against which may be set immensely valuable property in land and material and reserve funds exceeding £3,876,000 in value.

In 1919-20, Mr. Palmer of Messrs. Rendel, Palmer and Tritton, Consulting Engineers, London, was engaged by the Board to report on the West wharf scheme and the future development of the Port. Mr. Palmer's report follows the general lines laid down by the Board for the expansion and improvement of the port of Karachi, which are estimated to cost about £2,000,000, namely :—

1. The immediate construction of a quay wall for 6 berths and equipment thereof on the west side of the main ship channel.
2. The construction of two ship berths at the Native jetty.
3. The widening of the Native jetty frontage.
4. Improved accommodation for country craft.
5. The provision of a fishermen's harbour.
6. More oil piers and a second boat basin.
7. A graving dock.
8. The development of the Lower harbour.
9. The reconstruction of the East wharf.

The Karachi Port Improvement scheme, 1921, as it is called, which resulted from this report, provides for the immediate construction of

Improvement scheme. six and later on, as required, of more berths on the west side of the Harbour. So far, a site, sufficient for six berths, has been reclaimed by means of the suction dredger "Graham Lynn" and further reclamation is now being undertaken. The construction of 3 berths 1,650 ft. long on the west side of the Harbour for steamers of 34 feet draught is in progress and 9 berths will be built as required. Consideration is also being given to a scheme for the provision of 2 liquid fuel pipe lines of 10" diameter at a number of the East wharf berths, so that vessels burning oil may be able to bunker without removal from the loading and discharging berths.

The total expenditure up to the 31st January 1924 was Rs. 72,81,739 (£485,449).

Provided that no unforeseen delays are experienced, it is estimated that three berths on the west side will be ready for occupation by the middle of 1927, when the construction of an additional length of quayage will be considered, if trade developments do not necessitate the question being taken up earlier.

The quay wall is being built on the monolith system, and each of the three berths will be equipped with a liberal number of up-to-date electrically driven luffing cranes of 2 to 5 tons lifting capacity and a two storied transit warehouse for the reception of over 12,000 tons of cargo. The cranes will span three lines of rails and deliver goods into either wagons or transit warehouses. Rail facilities for the expeditious removal and supply of goods will be laid along the quays and behind the warehouses and the whole connected up, as at the existing East wharves, with the North-Western Railway system. The original intention was to use these berths for imports only, but it has now been decided to make them suitable for both import and export cargoes. The width of the channel between the East and West wharves will be 1,400 ft.

There are two other ports in Sind open to foreign trade, *Keti Bandar* and *Sirganda*, under the jurisdiction of the Principal Collector of Customs, Sind, but neither of them is of sufficient importance to deserve detailed mention.

**Minor ports in Bombay Presidency.**

South of Sirganda are *Mandvi*, the chief port of Cutch, and *Dwarka*, a famous place of pilgrimage in an isolated portion of the Baroda State, both ports of call on the Bombay-Karachi sea route. Steamers lie off at some distance of the shore and the traffic is chiefly local. The foreign trade of *Porbander* in Kathiawar was at one time prosperous but it is now chiefly coastwise. The Portuguese port *Diu* on the island of that name on the southernmost extremity of the same peninsula boasts an excellent harbour but its exchanges, once considerable with Mozambique, are now completely stagnant. *Surat*, situated 14 miles from the sea with which it is connected by a river, negotiable only by small country craft, was one of the earliest and most important of the East India Company's factories and its trade was very considerable in agricultural produce and cotton, the value of which was estimated in 1801 at over £1 million: A hundred years later this total had contracted to £200,000 and in the last fifteen years the decrease has been even more marked, most of the trade being now transferred to Bombay owing to the linking up of the two ports by the Bombay, Baroda and Central India Railway. South of Surat is *Daman*, the capital of the Portuguese settlement of that name, which has an area of 82 square miles and a population of 47,000. Even after the decline of the Portuguese power in India the volume of shipments of cotton goods made in Gujarat to East Africa was considerable and between 1817 and 1837 there was also a flourishing opium traffic with Macao, but since then the foreign trade has dwindled to nothing.

### Bombay.

The port of Bombay which is situated on an island of the same name in latitude 18° 55' N, longitude 72° 54' E, owes its importance to

its geographical position and to its magnificent natural harbour. As is well known, the island was part of the dowry of Catherine of Braganza, Queen of Charles II, who conferred it for an annual rent of £10 upon the East India Company in 1668. After the conquest of the Deccan 150 years later Bombay became a provincial capital but until the middle of the 19th century it continued little more than a collecting centre for the smaller ports of the west coast and for the relatively small strip of land between the western Ghats and the sea. A period of progress was initiated by the establishment in 1838 of a regular monthly mail service to England by the overland route across Egypt and twelve years later commenced the work of linking up Bombay by railway with the cotton growing tracts above the Ghats and the wheat fields of the Punjab and the United Provinces. The American Civil War gave Bombay cotton an unparalleled opportunity and, if the reckless speculation which ensued swallowed up many private fortunes, the port itself emerged with its wharves and accommodation greatly increased and improved and its commercial potentialities unimpaired.

In the following table the total value of the trade of the port during the last quarter of a century is recorded.

TABLE No. 10.—*Total value of the trade of the port of Bombay (foreign and coasting) in private and Government merchandise from 1897-98.*

Year.	Value of imports.	Value of exports.	TOTAL
	£	£	£
1897-98 . . . . .	34,850,330	28,889,280	63,739,590
1902-03 . . . . .	38,562,000	39,104,460	77,666,460
1907-08 . . . . .	60,852,330	46,791,000	107,643,330
1912-13 . . . . .	85,471,660	56,922,660	142,394,320
1917-18 . . . . .	79,642,660	70,921,600	150,564,260
1918-19 . . . . .	96,153,658	67,275,000	163,428,658
1919-20 . . . . .	116,379,403	107,865,981	224,245,384
1920-21 . . . . .	137,109,110	92,513,591	229,622,701
1921-22 . . . . .	113,498,196	89,893,297	203,391,493
1922-23 . . . . .	123,445,332	93,571,311	217,016,643

In spite of the disorganisation caused by plague since 1896 not only to the facilities of the port but also to the local industrial position, the trade of Bombay, as the above table indicates, has until recently continued uninterruptedly to expand, and owing to a variety of causes it suffered to a smaller extent than any other port in India from the adverse conditions created by the war. The temporary setback in 1921-22 was a reflection of adverse trade conditions everywhere and the partial recovery made in 1922-23 suggests that when the export trade revives the record achieved in 1920-21 will be eclipsed.

Bombay is connected with Gujarat and Northern India by the Bombay, Baroda and Central India Railway, and with the Deccan, Central India, the Gangetic plain, Calcutta and Madras by the Great Indian Peninsula Railway.

Of the raw materials brought down to the port for export, by far the most important is cotton, the other principal items being coal, hides, twist and yarn, grain and seeds, and manganese ore, while bullion, cotton manufactures, hardware, metals, machinery, kerosene oil, sugar and timber are the chief imports. Bombay has not the advantages possessed by Calcutta in having rich coal fields within two hundred miles or a system of navigable rivers to bring produce down to the port, but on the other hand she boasts a natural harbour directly upon the sea, which, thanks to its situation, is open at all times of the year.

The principal shipping lines calling at Bombay are the same as those of Calcutta. There is also a large pilgrim traffic to the Hedjaz and trade with the Persian Gulf ports in which Indian merchants take a preponderating part. The coasting trade with Karachi, Kathiawar, the Malabar coast and Goa is of considerable importance. The number of vessels which entered and cleared in the foreign trade in the year 1913-14 was 1,536 with an aggregate tonnage of 3,837,111. In 1922-23, the corresponding figures were 1,523 and 4,422,187.

The harbour is about ten miles long, from north to south, with a general width of from four to six miles, the anchorage for vessels being on the sheltered eastern side of the island.

**Shipping facilities.** There are three fully equipped wet docks, known respectively as Prince's dock, Victoria dock and Alexandra dock, having a total water area of 104½ acres and a total quayside of nearly 4½ miles; also two dry docks, the newer having a length of 1,000 feet and a width of 100 feet and the other a length of 525 feet and a width of 65½ feet. Over 200 hydraulic cranes with a lifting capacity varying from 30 cwt. to 100 tons are in use in the wet docks. Until comparatively recently the railway connection with the docks was decidedly inadequate and necessitated a double handling of goods. Raw cotton had to be transported by carts from the railway goods termini to the Cotton Green at Colaba and thence to the mills or docks, thus adding to the cost of the raw material. The new scheme recently completed by the Bombay Port Trust provides direct communication between the railways, docks and goods depots and extensive storage shed accommodation at Sewri. The cotton trade has now been transferred from Colaba to Sewri where the Port Trust have provided the largest

and best equipped depôt of its kind in the world. About three million bales of cotton can be accommodated and the depôt, with its fireproof ferro-concrete godowns fitted with automatic fire sprinklers, etc., cover an area of nearly 500,000 sq. yds.

The following table gives a comparison between the years 1913-14 and 1922-23 of the principal items of import and export trade dealt Trade of the port. with at the port of Bombay.

TABLE No. 11.—Quantity of the principal items of import and export at the port of Bombay in 1913-14 and 1922-23.

IMPORTS.

Quantity. 1913-14.	Particulars of the principal items of trade.	Unit.	Quantity. 1922-23.
42,649 000	Kerosene oil and Liquid Fuel.	Gallons	78,319,000
656,000	Coal . . . . .	Tons.	562,000
522,000	Cotton . . . . .	Packages.	633,000
452,000	Piecegoods . . . . .	Bales and Cases.	213,000
326,000	Bricks, Tiles, Chunam and Sand.	Tons.	399,000
298,000	Grain . . . . .	"	417,000
238,000	Iron and Steel . . . . .	"	228,000
525,000	Sugar . . . . .	"	180,000
139,000	Machinery, Boilers and Railway Materials.	"	200,000
125,000	Hardware . . . . .	Packages.	88,000
102,000	Timber . . . . .	Tons.	90,000
96,000	Firewood . . . . .	"	88,000
49,000	Twist and Yarn . . . . .	Bales.	106,000
18,000	State Railway and Civil Stores.	Tons.	78,000
16,000	Wool . . . . .	Packages.	13,000
12,000	Hardware . . . . .	Tons.	16,000

EXPORTS.

Quantity. 1913-14.	Particulars of the principal items of trade.	Unit.	Quantity. 1922-23.
5,287,000	Kerosene oil . . . . .	Gallons.	5,675,000
2,195,000	Cotton . . . . .	Packages.	2,879,000
822,000	Seeds . . . . .	Tons.	599,000
612,000	Manganese ore . . . . .	"	364,000
529,000	Twist and Yarn . . . . .	Bales.	257,000
451,000	Grain . . . . .	Tons.	183,000
404,000	Hides . . . . .	Nos.	2,000
237,000	Piecegoods . . . . .	Bales and Cases.	368,000
51,000	Groundnuts . . . . .	Tons.	42,000
46,000	Sugar . . . . .	"	58,000
31,000	Myrobalans . . . . .	"	33,000
31,000	Iron . . . . .	"	30,000
28,000	Bones . . . . .	"	13,000

The affairs of the port are under the supervision and control of the Bombay Port Trust, a body consisting of a Chairman and twenty members, seven of whom are nominated by Government, which had its origin in 1862 in a private concern called the Elphinstone Land and Press Company. This Company entered into a contract with Government to provide a hundred acres for the terminus of the Great Indian Peninsula Railway receiving in return the right to reclaim from the sea for its own advantage two hundred and fifty acres fronting its own properties. Developments of the port immediately followed, but the Government, seeing it inadvisable to vest such a monopoly of the harbour front in a private company, decided to buy it out and transfer its properties to the charge of a public trust. In 1869 therefore the rights of the Company were taken over by Government and finally vested in a newly created Port Trust in June 1873. In 1879 the Trust was reconstituted by Government on a basis which has remained practically unchanged to the present day. With the opening of the Prince's Dock in 1880, the financial difficulties of the Trust disappeared. The revenue in 1922-23 amounted to £1,730,823 against an expenditure of £1,718,310. The net surplus on the year's working was £15,481 and the total debt of the Trust at the end of the year amounted to £13,797,754.

Large developments have been carried out in recent years by the Trust to meet the growing demands of an increasing trade, and four schemes, at an aggregate cost of about £10 millions, have now been completed: (1) the construction of one wet and one dry dock; (2) the reclamation from the sea of about 583 acres of land to the north of the docks to provide goods depôts; (3) the construction of the new Port Trust Railway connecting with the Great Indian Peninsula and Bombay, Baroda and Central India Railways at a point about 6 miles outside the city where it takes over their traffic and distributes it at the various goods depôts or rails it direct into dock as required; (4) a deep water pier at Trombay for the discharge of bulk petrol, with pipe connection to the oil installation at Sewri. The sea wall of the new Alexandra Dock has been extended 1,500 feet on the west to form the new Ballard pier on which a commodious passenger station has been erected, from and to which the mail trains run and at which mail passengers land and embark. An additional passenger berth has been opened at No. 18 Alexandra dock.

A new Custom House adjoins this new landing pier at which the mail sorting offices are also accommodated. Part of the new Port Trust Railway was opened for traffic in January 1915 and the main system is now completed. The traffic of the railway has developed steadily since 1915-16 as the revenue receipts of that year, namely, £66,460 rose to £99,600 in 1916-17 and £155,200 during 1922-23. The total length of the track, including sidings, is over 100 miles. The new docks, railway and goods depôts were all of inestimable value during the period of war when the facilities they provided were fully made use of for Government requirements.

In the following table are shown the revenue and expenditure of the Port Trust during the last twenty five years. In that period the income of the Commissioners has steadily increased and is now nearly six times what it was in 1897-98.

TABLE No. 12.—Revenue and expenditure of Bombay Port Trust from 1897-98.

Year.	Receipts.	Expenditure.
	£	£
1897-98 . . . . .	306,590	319,730
1902-03 . . . . .	394,000	366,600
1907-08 . . . . .	518,400	436,460
1912-13 . . . . .	595,530	515,130
1917-18 . . . . .	1,166,930	1,041,330
1918-19 . . . . .	1,284,144	1,215,136
1919-20 . . . . .	1,346,860	1,328,622
1920-21 . . . . .	1,523,718	1,511,511
1921-22 . . . . .	1,500,480	1,571,338
1922-23 . . . . .	1,730,823	1,718,310

#### Mormugao.

On the Konkan coast south of Bombay there is no port of any size until one reaches Mormugao, though *Janjira*, *Malwan* and *Vengurla* have between September and May a considerable coasting trade with Bombay and Malabar coast ports. Mormugao situated on the eastern extremity of the peninsula of that name in Portuguese India, about five miles south of Panjim or Nova Goa, the capital, is the terminus of the West of India Portuguese railway. This line was built by an English Company under the guarantee of the Portuguese Government and worked since 1903 by the Madras and Southern Mahratta Railway. The port is also worked by the railway but quay and tonnage dues are collected by the Government of Portuguese India and handed over to the Railway. The Portuguese Government also appoint the Port Officer, Port Health Officer and Customs establishment.

Mormugao has developed considerably in recent years as a port. A breakwater 1,200 feet long was completed in 1916 to afford protection against the south-west monsoon and within the

**Port facilities.** sheltered harbour thus created there is a quay wall at right angles capable of berthing several ocean-going steamers. This quay is fitted with 20 travelling cranes including one with a carrying capacity of 30 tons, and one of 25 tons. There is also a steam dredger. The port is open all the year round. Apart from the Customs warehouse there are ten sheds, of which nine belong to the railway and one to a private firm. Loading and discharging is done by the railway company whose wagons run alongside the quay. The Bombay tonnage scale applies in the absence of other agreement or charter. Mormugao is a distributing port and her foreign exports consist chiefly of the produce of Mysore and Hyderabad, and the Bombay-Deccan, particularly cotton and manganese. Ex-

ports from Portuguese India are salt, coconuts and areca nuts. The value of the imports and exports during the last ten years is shown in the following table. Latterly the statistics have been maintained for the Calendar year, and the figures for the first three months of 1918 when the change was made, are included in those for 1917-18 also.

TABLE NO. 13.—Trade of Mormugao harbour from 1913-14 onwards.

Year.	Imports.	Exports.
	£	£
1913-14 . . . . .	154,750	52,219
1914-15 . . . . .	166,328	25,623
1915-16 . . . . .	176,955	89,379
1916-17 . . . . .	226,549	61,315
1917-18 . . . . .	157,154	77,236
1918 . . . . .	282,645	121,966
1919 . . . . .	481,910	119,317
1920 . . . . .	45,900	93,744
1921 . . . . .	442,127	97,229
1922 . . . . .	480,385	71,687

#### Mangalore.

To the south of Goa lies the Bombay district of North Kanara with the ports, only open to the coasting trade, of *Karwar*, *Honavar* and *Bhatkal*, the last-named being close to the frontier of the Madras district of South Kanara. Passing *Coondapoor* which is a port of call only for steamers on the Bombay-Mangalore run, Mangalore, the district headquarters with a population of 54,000, is reached at the junction of the Gorpur and Netravati rivers, about 130 miles south of Mormugao. It is a tidal port served chiefly by backwater communication with the hinterland. There is a Port Officer and Customs Collector. Mangalore is the north-western terminus of the South Indian Railway. Vessels up to 200 tons can anchor inside the backwater; larger vessels lie about three miles from the shore. There is a small lighthouse. The chief exports to Europe are pepper from neighbouring areas, coffee and sandalwood from Mysore, and tiles, rice, salt fish, dried fruits and fish manures to Ceylon, Goa and the Persian Gulf.

The foreign import trade is negligible but Mangalore is the favourite port on the coast for the Laccadive and Amindivi islanders, who bring their coir and other coconut produce there for sale. 114 steamers aggregating 213,420 tons cleared the port in 1913-14 and in 1922-23, 121 steamers aggregating 178,962 tons.

#### Tellicherry.

Tellicherry with a population of about 28,000 is situated about 94 miles south of Mangalore and 14 miles south of Cannanore, a town of about the same size with much smaller foreign trade. Steamers, which anchor about two miles off the shore, can work at Tellicherry even during the monsoon when all the other ports on the coast are closed, owing to the

natural backwater provided by the rocky approaches to the port. A sea-wall of laterite in cement, 1,195 feet in length, has recently been built to afford protection against erosion and a pier, 560 feet in length, to be provided with four 1-ton and one 5-ton fixed cranes, is under construction. Tellicherry is the headquarters of a Port Officer and Customs Collector and is on the Calicut-Mangalore extension of the South Indian Railway. The principal exports are coffee and pepper, which come down by road from estates in Mysore and Coorg, copra, sandalwood and tea.

128 steamers aggregating 381,146 tons cleared the port in 1913-14, and in 1922-23, 101 steamers aggregating 319,748 tons.

#### **Mahé.**

About five miles south of Tellicherry one enters the small French settlement of Mahé with an area of about five square miles and a population of about 10,000 in charge of an *Administrateur*. The town itself is picturesquely situated on the slopes of a hill on the southern bank of the Mahé River where it enters the Arabian Sea. There has been no foreign trade for several years except through the adjoining port of Tellicherry.

#### **Calicut.**

Calicut, the capital of the Malabar district, is some 42 miles south of Tellicherry and about 90 miles north of Cochin. It is 413 miles by rail from Madras, and the headquarters of a Port Officer and Customs Collector and also of an Inspector of Customs, subordinate to the Collector of Customs, Madras. A Chamber of Commerce was opened here in 1923. The population exceeds 82,000. The port is practically closed during the south-west monsoon from the end of May until the latter half of August. The sea is very shallow and steamers anchor about three miles from the shore, connection being maintained by lighters and small boats. Native craft of 150 tons and below lie about 800 yards off the shore.

There are two new piers about  $1\frac{1}{2}$  miles apart, each 775 feet long and fitted with eight cranes (two of each set being of five-ton capacity and the remaining six being of one-ton capacity) to facilitate shipment into lighters.

**Port facilities.** The northern pier is opposite to the Custom House, and the southern abuts on the native bazar. Beypore, seven miles to the south at the mouth of the river of that name, is regarded as a wharf of Calicut port. It has eight wharves along the river bank and native craft of 150 tons burthen are able to anchor half a mile from the mouth. The lighthouse at Calicut is visible 12 miles out at sea.

The number of steamers clearing the port in 1913-14 was 187, the figures of total tonnage being 567,620. The corresponding figures for 1922-23 were 212 and 564,193.

The principal exports are coir, coir fibre, copra, coffee, tea, pepper, ginger, rubber and fish manure. The foreign import trade, which is insignificant, consists chiefly of metals, machinery and provisions.

### Cochin.

Cochin, situated about 90 miles south of Calicut, is the most important port between Bombay and Colombo, and in the Madras Presidency the value of its trade is only exceeded by that of Madras and Tuticorin. The system of backwaters running parallel with the coast affords cheap transport, and when the natural situation of the port has been fully developed, its position should ensure a very great increase in its trade. Cochin is nearly 300 miles nearer to Aden than Bombay and over 300 miles nearer to Durban.

The Cochin harbour scheme contemplates in the first instance the cutting open of a channel across the bar at the mouth of the backwater

**New Harbour Scheme.** to provide ocean-going steamers with access at all tides and in all weather conditions to the inner harbour where anchorage accommodation will be provided for such vessels. As part of the scheme, about 150 acres of land will be reclaimed adjoining the Venduruthi island for port purposes, where it is proposed to locate the offices, godowns, and buildings required for the harbour authority. As the success of the scheme depends on the possibility of dredging the bar to a depth of 30 ft. and keeping it open at all seasons of the year at a cost within the financial capacity of the port, an experimental channel, about 150 ft. wide, was cut across the bar and completed in May 1923 at a cost of about Ra. 9 lakhs (£60,000). The Harbour Engineer's report on the result of the experiment is under the consideration of the Madras Government. If the experiment is declared to be a success, the next stage of the scheme, *viz.*, the dredging of the permanent channel and the provision of moorings for vessels will be proceeded with at a cost of about Ra. 45 lakhs (£300,000). A dry dock at a cost of Ra. 3.87 lakhs (£25,800) is in the meanwhile nearing completion. Though the present port of Cochin lies in British territory, it is impossible to make any large development of it without including in it areas of the Cochin State and ultimately of the Travancore State also. An agreement has therefore been entered into by the British Government with the Cochin and Travancore Darbars under which, subject to certain conditions, the three Governments are joint partners in the financing and development of the harbour and will divide among themselves equally the customs collections of the port from the time it becomes the regular practice for ocean-going steamers to come inside and discharge at moorings, the existing arrangements under the Interportal convention of 1865 being superseded. It is hoped to introduce a Port Trust Bill at a very early date and constitute a Trust for the port on the lines of those at Bombay and other major ports. If the new harbour scheme materialises it will be necessary to link Ernakulam with the Podanur-Mangalore broad gauge section, of the South Indian Railway by a broad gauge line instead of the metre gauge which at present connects it to Shoranur, so that no break of gauge may check the flow of traffic to the port from the fertile hinterland it is designed to serve.

Steamers now anchor in the roads about 2½ miles from the wharves and while business at the port is practically at a standstill from the end of May until the middle of August when the trade in coconut produce is slack, cargo can be

**Present port facilities.**

worked when required owing to the protection afforded by the Mallapuram sandbank three miles to the north. Launches tow the cargo boats to and from the steamers. A new Custom House has lately been opened with wharves designed to carry seven cranes. The Customs and Port offices and principal business houses occupy the foreshore of British Cochin, while the railway serving the port has its terminus at Ernakulam, the capital of the Indian State of Cochin, on the eastern side of the back-water about two and a quarter miles away.

By the Interport Convention of 1865, the Cochin Darbar agreed to abolish the tobacco monopoly and inland transit duties and to equalize

the rates of Customs duties at its ports with those in force at British Indian ports as well as to sell salt within its limits at prices ruling in the adjoining district of Malabar. In return for these concessions, the British Government guaranteed a minimum customs and tobacco revenue of £7,360. As there are no ports in the State open to foreign trade and as the Customs revenue has gone up very considerably at Cochin in recent years, this subsidy has lately been increased. The exports from Cochin consist chiefly of coir, copra, coconut oil, tea and rubber, and the groundnut trade has great potentialities when the railway communications have been improved, as the area under this crop in the adjoining districts is steadily increasing. The port is the headquarters of a Port Officer and Customs Collector. The population of British Cochin is 21,000 and of Ernakulam 23,000.

The number of steamers clearing the port in 1913-14 was 225, their aggregate tonnage being 715,313. The corresponding figures for 1922-23 were 233 and 730,588.

Proceeding further south, the coast line for about 200 miles is that of Travancore.

By the Interport Convention of 1865 the Travancore Durbar agreed to apply at all its seaports the tariff in force from time to time at ports in British India. The duty on salt is enhanced or reduced in accordance with the rates current in British India. Tea on which export duty has been levied at a land Customs station in Travancore is exempt from export duty on shipment at a Cochin or other British Indian port and revenue realised on foreign produce imported at British Indian port for re-export to Travancore is credited to the State.

#### Alleppey.

Alleppey, the premier port and commercial centre in Travancore with a population of 32,000, is situated about 50 miles north of Quilon and 35 miles south of Cochin. A canal connects the port with the interior backwaters. It is a convenient depot for the storage and disposal of all fresh produce and possesses a harbour affording safe anchorage during the greater part of the year. A mud bank in the roadstead acts as a natural break-water against the force of the roughest seas. The aggregate tonnage of vessels touching at the port is about 300,000.

The chief exports are copra, coconuts, coir fibre and matting, cardamoms, ginger and pepper. The port possesses a lighthouse and pier, and a tramway worked by *coolies* conveys goods from the latter to the warehouses.

### Quilon.

Quilon, the Coilum of Marco Polo, has been a trading centre from very early times. It is connected with Alleppey by backwater and is on the Shencottah-Quilon-Trivandrum branch of the South Indian Railway constructed at the cost of the Travancore Darbar. The chief industries are cotton spinning and tile manufacture. Vessels anchor about  $\frac{3}{4}$  mile from the shore and a railway siding runs up to the landing place. The chief exports are coconut oil, coir mats, timber and fish, but the foreign trade is insignificant.

### Tuticorin.

After rounding Cape Comorin, the southernmost point of the peninsula, one enters again the Madras Presidency and reaches Tuticorin. This port, which is open all the year round, with a population exceeding 44,000, has next to Madras the largest trade in Southern India. It is the headquarters of a Port Officer and of a Customs Collector, and is the south-eastern terminus of the South Indian Railway. An Inspector of Customs, who controls in addition the minor ports of Kayalpatnam and Kulasekharapatnam, is also stationed here.

The harbour is so shallow that steamers anchor about five miles from the shore and continuous dredging is necessary to keep the channel open between the shore and the roadstead. At the same time Hare Island, upon which the lighthouse is situated, affords considerable protection to the lighters and other craft used for landing and shipping and work is seldom interrupted by the weather. The port is equipped with two piers. The South Indian Railway runs alongside the landing and shipping wharves from which passengers and goods can be transhipped to launches and lighters. About £24,000 has been spent since 1911-12 in affording increased facilities for the landing, shipping, storing and clearing of goods. These improvements include a new pier, a new Customs goods shed, new trolley lines, and a shed for storing combustibles and reclamations along the foreshore for stacking goods.

The scheme for the construction of a deep water harbour at Tuticorin contemplates the dredging of a narrow landlocked canal through the coral reef and Hare Island, with two sidings, each 700 ft. long at the western extremity of the canal for vessels to lie in, and the excavation of a turning basin beyond the western extremity with banks on the north and south sides to accommodate two other vessels. The cost of the scheme is estimated at about Rs. 40 lakhs (£267,000), which is within the capacity of the port to finance. A sum of about Rs. 6 lakhs (£40,000) was spent during the year 1923-24 and estimates for Rs. 12 lakhs (£80,000) have been sanctioned for 1924-25. The whole scheme is expected to be completed in five years.

A bill for the constitution of a Port Trust has recently been passed by the Madras Legislative Council and a Trust will be formed at the port very shortly.

Passenger traffic to and from Ceylon has largely been diverted upon the opening of the Dhanushkodi route and the volume of goods traffic has not yet recovered to pre-war levels.

There is a very considerable trade with Ceylon in rice, pulses, onions, chillies and livestock for consumption in that island. Other chief articles of export are raw cotton (to Japan, the United Kingdom and, prior to the war, Germany), tea, coffee, senna leaves and palmyra fibre. The number of steamers that cleared from the port in 1913-14 was 526, the total tonnage being 1,183,736. In 1922-23, the number was 302, the total tonnage being 820,826. The value of the foreign trade in 1913-14 was £6,592,000, of which more than £4,500,000 was export trade. In 1922-23, the corresponding figures were £3,353,000 and £2,489,000.

#### Dhanushkodi.

Dhanushkodi is the terminus of the South Indian Railway on the south-eastern extremity of the island of Rameswaram, at the junction of Palk Strait with the Gulf of Manaar and connected with Talaimanaar in Ceylon 21 miles distant by a daily turbine steamer service, the journey being made in about two hours. The port is equipped with two piers. Cargo is loaded direct from the railway trucks on these piers into steamer hatches. The port was opened in 1913 and so far has scarcely justified the expenditure incurred upon it. It is the headquarters of an Inspector of Customs, who also controls the ports of Pamban at the western end of Rameswaram island, Mandapam on the mainland opposite Devipatnam and Tondi. The chief exports are coffee, fish (dry and salted), rice, rubber, tea and cotton piecegoods. The population consists almost entirely of employees of the Railway, Post Office and Customs. All business on behalf of shippers is transacted by the South Indian Railway. The number and tonnage of vessels cleared during the last ten years, with the value of the export trade, are shewn in the table below.

TABLE No. 14.—Number and tonnage of vessels that cleared from Dhanushkodi and the value of its export trade.

Year.	No.	Tonnage.	Value of export trade.
			£
1913-14 . . . . .	27	7,096	Not available.
1914-15 . . . . .	479	121,762	467,200
1915-16 . . . . .	726	171,048	1,474,000
1916-17 . . . . .	683	174,287	1,707,300
1917-18 . . . . .	823	192,582	2,131,700
1918-19 . . . . .	587	141,216	1,618,800
1919-20 . . . . .	547	104,017	1,259,800
1920-21 . . . . .	373	93,919	1,074,500
1921-22 . . . . .	455	114,714	1,806,500
1922-23 . . . . .	371	94,489	1,423,800

### Negapatam.

The chief port in the Tanjore district is Negapatam, about 13 miles south of Karikal, with a population of 54,000. The harbour is equipped with wharves and other facilities for the landing and shipment of goods and the considerable foreshore to the north is utilised for the storage of timber. Negapatam is the terminus of a branch of the South Indian Railway and a siding runs into the harbour premises. The port is further connected by river and canal with the tobacco-growing areas to the south.

A safe anchorage for steamers is found within two miles of the shore and there is a plentiful supply of boats of from 5 to 12 tons which serve as lighters. The numerous sailing craft which trade between this port and Ceylon anchor

#### Port facilities.

about half a mile away. Negapatam is the head-quarters of a Port Officer and Customs Collector as well as of an Inspector of Customs whose jurisdiction extends from Nagore on the north to Pudupatnam (a sub-port of Tondi) on the south, a distance of nearly 100 miles. The harbour is situated at the junction of the Kaduvaiyar River with the sea and the bar at the mouth cannot be crossed by fully laden boats at low water. Nagore, 5 miles to the north, a great place of pilgrimage for Mahomedans, is a wharf of Negapatam.

The Europe mail for the Straits Settlements is railed from Bombay to Negapatam and thence taken to Penang and Singapore by a connecting steamer. The number and aggregate

#### Foreign trade.

tonnage of the steamers clearing the port during 1922-23 was 110 and 317,989 tons, respectively, as compared with 243 steamers, aggregating 684,300 tons in 1913-14. The principal exports from Negapatam are groundnuts for Europe (chiefly to Marseilles and Trieste prior to the war), and coloured cotton piecegoods, tobacco and fresh vegetables for Penang, Singapore and Colombo, the port being the chief provisioning centre for the *coolies* who are constantly leaving by this route to work on rubber and tea estates in Ceylon and the Federated Malay States.

### Karikal.

The French settlement of Karikal, covering an area of 53 square miles and a sea-board of 12 miles with about 60,000 inhabitants, is surrounded except to seaward by the Tanjore District. Karikal, the capital, is situated on the north bank of the river Arasalar about 1½ miles from its mouth. The *Administrateur* is subordinate to the Governor at Pondicherry. The port boasts a lighthouse, 142 feet high, and is connected by railway with Peralam. The port is an open roadstead and has no direct trade with France, but there is a considerable rice traffic by country boat with Ceylon and the Straits Settlements. The Standard Oil Company has a large installation at Karikal, which is a free port, including several big storage tanks, and a factory for making kerosene oil tins and wooden cases. In this way the bonding of large quantities of oil is avoided, despatches being made into adjoining British territory and duty paid thereon only when requisitioned. In 1922, 2½ million imperial gallons of oil were imported by sea.

The chief traffic is rice, arecanuts, matches, fire works and kerosene oil.

#### Cuddalore.

Cuddalore is situated about 15 miles south of Pondicherry with a population of 51,000. Cuddalore Old Town is on the main line of the South Indian Railway from Madras to Tuticorin and is connected with the port by a siding which runs up to the wharves. Steamers anchor about a mile off shore, and the harbour wharves are situated on the western bank of the Uppanar backwater and have lately been provided with a quay wall to facilitate the loading and unloading of cargo boats therefrom. There is a lighthouse on the eastern bank of the backwater. Cuddalore is the head-quarters of a Port Officer and Customs Collector with an Inspector of Customs whose jurisdiction extends over the ports of Cuddalore, Porto Novo, Tirumalaivasal and Tranquebar, besides *chaukis* and outgates on the Pondicherry and Karikal frontiers. The export trade consists principally of groundnut kernels (chiefly to Marseilles), oil-cake for manurial purposes (to Ceylon and Java) and coloured piecegoods (to the Straits Settlements). The coasting trade consists mainly of groundnut oil, refined sugar from Nellikuppam and pulses. The foreign import trade is negligible.

The number and aggregate tonnage of steamers clearing the port in 1922-23 was 136 and 403,577, respectively.

Proceeding further north the coast-line for fifteen miles is that of Pondicherry.

#### Pondicherry.

Pondicherry, the capital of the French Settlements in India (*Etablissemens francais dans l'Inde*) and the residence of the Governor, is situated on the Coromandel Coast, 104 miles

**Situation.** south of Madras, by road through Chingleput, Tindivanam and Mahilam. The roadstead possesses as good an anchorage as is to be found in the Bay of Bengal and there is also a pier 300 yards long fitted with electric elevators and having a reinforced concrete flooring with two lines of rails to facilitate the landing and shipment of goods. The town, which has a population of 47,000 enjoys a good water supply and is lighted by electricity. Steamers can anchor within two or three hundred yards of the pier but loading and unloading is done mostly from the shore in country boats.

Pondicherry is the centre of the export trade in groundnuts from French territory and the adjoining British districts to Marseilles. The town contains three spinning and weaving mills, of which the most important is under English management; these

**Trade and industries.** three mills have 1,638 looms and 68,944 spindles and find employment for 6,000 persons and their productions are shipped chiefly to the French Colonies. There is also a cottage industry for producing coloured cloth called *saylasse*, which is exported to Singapore. There is a factory where bonemeal manure is prepared for the planters in the Shevaroy Hills and in Ceylon, an ice manufactory and a factory for making nut butter owned by a British firm. The Standard Oil,

Burma Oil and Asiatic Petroleum Companies have small storage tanks near the railway station.

Pondicherry is the headquarters of a British Consul and there is a Chamber of Commerce founded in 1854 and reorganized in 1914. The French Territory round Pondicherry has an area of approximately 115 square miles and a population in 1922 of about 126,000 and the frontier which has a perimeter of about 70 miles, is guarded by a cordon of land customs posts, the principal one being at Pondicherry station as the bulk of the traffic is railborne. Pondicherry is connected with the main line of the South Indian Railway by a branch which takes off at Villupuram and is also connected by motor services with Cuddalore, fifteen miles to the south. The principal exports are shelled groundnuts (arachides décortiquées), unbleached cloth, guinées (blue cloth manufactured locally chiefly for French Colonies), *saylasse* cloth for the Straits Settlements, ghi, onions, mangoes and bone meal manure. The chief imports are raw cotton, arecanuts, foodstuffs, cement, wood and other building materials, wines and spirits by sea, and by land coal, gunnies and motor spirit. Pondicherry is a free port and no import duties are levied. There are special arrangements in force to regularise the free transport of articles that are dutiable in British India between one French village and another through intervening British villages. The British Indian rupee is the usual unit of currency, though the only bank in Pondicherry is a branch of the Banque de l' Indo-Chine. This Bank issues notes, which are legal tender only in French India, of one, ten and fifty rupees denomination. The trade statistics are shewn in francs. The combined value of the imports into Pondicherry, Karikal, and Mahé in 1922 amounted to 25,982,589 francs and the tonnage of vessels entering and clearing the 3 ports was 472,324, of which, 104 ships with an aggregate tonnage of 355,441 cleared from Pondicherry.

#### Madras.

The next port of importance as one proceeds northwards, for *Sadras* and *Covelong* have degenerated into mere fishing villages, is Madras, the capital and chief port of the Presidency of that name, 1,032 miles south-west of Calcutta, which has a population exceeding half a million. Until an artificial harbour was constructed, Madras was an open roadstead with a surf-beaten coast line, communication between ship and shore being effected by *masula* boats and *catamarans*. The present harbour has been formed by two concrete walls projecting into the sea so as to enclose a space of about 200 acres with an entrance from the north-east, within which as many as 15 vessels drawing up to 30 feet can be accommodated.

There are six wharves provided with all modern conveniences for the rapid discharge and loading, alongside each of which one vessel can lie in 26 to 30 feet of water in low tide. There are also eight mooring berths inside the harbour, and two berths outside, protected by the north arm of the harbour. A tug of 950 h.p. is available at all hours for assisting in the mooring and unmooring of vessels. Landing and shipping of cargo for vessels at moorings is effected by lighters of 20 to 100 tons capacity. These lighters are

discharged and loaded at the wharves. The western face of the harbour has been quayed so that the ships can now lie alongside and work cargo direct out of and into the sheds. There are three other quays connected up by rail with all parts of the harbour for the discharge of case oil and petrol, coal, horses and cattle. Vessels can enter and leave the harbour at all times of the day and night. Oil from bulk oil steamers is pumped ashore direct through the pipes into the merchants' installations.

The west quay is provided with modern hydraulic cranes, capable of working directly into and out of the holds of vessels lying alongside

**Cranes.** and there are several small one-ton hydraulic cranes between berths for loading or discharging lighters and barges. In addition to these there are ten one-ton and seven two-ton hydraulic cranes at the wharves for lighter working, and several steam cranes of three-ton capacity. The cranes for working heavy lifts consist of one 15-ton gantry crane, one 33-ton and one 40 ton titan.

The warehouse accommodation covers over 10 acres and includes four transit sheds for the storage of goods in transit between ship and shore

**Other facilities.** and three warehouses with flat roofs for the convenience of shippers dealing in groundnuts and other staples which ordinarily need be cleaned, dried and graded before shipment from Madras.

There is a nine-acre boat basin which gives the necessary protection in all weathers to all the small craft. It is provided with 1,600 feet of shallow quay walling alongside of which barges and cargo boats can lie and is largely used for the landing and shipping of iron and stone and non-dutiable coastwise cargo. This boat basin also contains a slipway for the repair of vessels of 400 tons. An area has also been reserved in which smaller boats and barges can be built.

There is a two-acre timber pond provided with small jetties and cranes together with all facilities for handling timber for which there is a large storage area. There is also another large quayed pond with cranes, railways, etc., for bar iron.

The harbour is connected with the broad gauge system of the Madras and Southern Mahratta Railway on one side and the metre gauge system

**Railway communications.** of the South Indian Railway on the other. All the sheds and quays are adequately served by railway sidings so that cargo may be discharged into or out of railway wagons directly by steamers.

The affairs of the port are administered under the Madras Port Trust Act, 1905 (II of 1905) (as amended up to 1919), by the Madras Port

**Port Trust.** Trust Board consisting of fourteen members, six nominated by Government, four elected by the Madras Chamber of Commerce, two by the South India Chamber of Commerce and two by the Trades Association, and a Chairman. Normally the Government nominees include the Collector of Customs, the Presidency Port Officer, and the Agents of the Railways working into Madras. The Board also are Conservators of the Port under the Indian Ports Act, with a Royal Indian Marine officer as Deputy Port Conservator.

The value of the foreign and coasting trade of the port in private and Government merchandise and the revenue and expenditure of the Port Trust are shown below.

TABLE No. 15.—Value of the trade of the port of Madras and the income and expenditure of the Port Trust over a series of years.

Year.	Value of imports.	Value of exports.	TOTAL.	Receipts.	Expenditure.
	£	£	£	£	£
1897-98 . . .	4,789,686	3,783,738	8,573,424	41,712	41,774
1902-03 . . .	5,015,249	3,622,794	8,638,043	49,224	38,237
1907-08 . . .	7,198,012	4,918,648	12,116,660	70,134	50,219
1912-13 . . .	8,435,056	6,004,815	14,442,871	83,025	56,567
1917-18 . . .	8,859,774	7,224,478	16,084,252	107,068	81,635
1918-19 . . .	9,963,292	6,417,659	16,380,951	131,463	94,529
1919-20 . . .	11,815,812	12,999,743	24,815,555	169,978	111,707
1920-21 . . .	17,976,070	7,570,486	25,546,556	197,252	133,339
1921-22 . . .	15,712,820	7,913,396	23,631,216	169,533	139,478
1922-23 . . .	15,420,770	9,162,826	24,573,596	186,950	148,904

The debt of the Port Trust Board amounted on the 31st March 1923 to ₹94,366. These loans are being paid off by equated payments at a rate which will amortise the whole of the Trust's debt in 1952.

Proposals for further improvements to cost £330,000 are now before Government and include a large increase in the shed space, the provision of modern electric portal cranes to work direct from ships' holds, and the construction of an additional ship quay, besides many minor amenities.

The chief imports into Madras are cotton manufactures, metals and ores, cotton twist and yarn, railway plant and rolling stock, machinery and millwork, sugar, spices, oils, hardware and apparel, and the chief exports, seeds, leather, raw cotton, grain and pulse, coffee, tea, cotton manufactures, coir, Bimlipatam jute and spices.

The number of vessels that entered and cleared the port in the foreign trade in 1913-14 was 511 with an aggregate tonnage of 1,182,944, the corresponding figures for 1922-23 being 632 and 1,989,179.

North of Madras there is no port of importance open to foreign trade until one reaches Masulipatam.

#### Masulipatam.

Masulipatam, the principal port in the delta of the Kistna River, is now connected by a branch line from Bezvada with the main line from Madras to Calcutta. The railway has a goods siding for traffic which runs along the wharves and facilitates shipment. A Port Officer and Customs Collector are stationed here. The port has few natural advantages. Large vessels cannot anchor within five miles from the shore, and the harbour wharves (five in number) are distant another three miles up a tortuous tidal creek, with a lighthouse near the entrance. Native craft up to about 150 tons can cross the bar at the

mouth of this creek at high tide but in foul weather communication between ship and shore is practically suspended. Steamers touch here only occasionally and foreign trade is chiefly by native craft with Ceylon, the principal exports being paddy, rice, gingelly and cotton seeds. The prosperity of the port has never recovered from the cyclone of 1864, when a tidal wave caused a disastrous inundation involving the loss of 30,000 lives. The present population is about 44,000.

In 1922-23, 151 sailing vessels cleared with an aggregate tonnage of 12,499.

#### **Cocanada.**

About 120 miles to the north of Masulipatam is Cocanada, situated on the Godavari delta, which in spite of certain disabilities ranks fourth in importance among the ports of the Madras

**Features of port.** Presidency. Large steamers anchor about seven miles from the shore and service with them is maintained by lighters ranging from 16 to 86 tons, which land their cargo at the numerous small wharves situated near the mouth of the Cocanada canal. Smaller craft can come within three miles, and if not drawing more than five feet can, at certain tides, even reach Cocanada itself. There are 28 jetties and wharves from which goods may be shipped. In spite of constant dredging the greatest difficulty is experienced in keeping the entrance of the canal clear of silt.

Cocanada, with a population of 53,000, is the headquarters of a Port Officer and Customs Collector as well as of an Inspector of Customs whose jurisdiction extends from the port of Gopalpur in the Ganjam district to Kottapatam in Guntur. The European and Indian mercantile communities each boast a Chamber of Commerce. The principal shipments to Europe are raw cotton to the United Kingdom and France, while rice and paddy go in large quantities to Ceylon and Mauritius. The import trade consists chiefly of kerosene oil from America, unrefined sugar from Java and metals from the United Kingdom. Cocanada is connected by a branch railway running from Samalkota (10 miles distant) with the main line from Madras to Calcutta. There is a station near the wharves and a large shed for the storage of goods awaiting shipment. In 1913-14, 192 steamers with an aggregate tonnage of 496,021 cleared the port. The corresponding figures for 1922-23 were 159 and 452,536.

#### **Vizagapatam.**

Vizagapatam, with a population of 45,000, is a port with great potentialities situated at the headquarters of the district of that name, about 545 miles south of Calcutta and 105 miles north of Cocanada. Two miles from the port at Waltair is the junction of the Madras and Southern Mahratta with the Bengal Nagpur Railway.

A scheme for the development of a deep water harbour by dredging out a swamp about six square miles in area and widening and deepening at the same time a tidal creek,

**New harbour scheme.** which connects it with the sea, has been investi-

gated and the necessary land acquired. The harbour will be constructed and worked as part of the Bengal Nagpur Railway undertaking, and funds for its construction will be provided by the Government of India. Simultaneously the area to be served by the port will be extended by completion of the branch line already partly constructed from Vizianagram (a junction some 40 miles north of Vizagapatam of the Bengal Nagpur Railway) to Raipur in the Central Provinces which will tap an area rich in manganese, cotton and oilseeds. The existing landing and shipping wharves which boast a single big crane, are on the northern side of the tidal creek about three furlongs from its mouth and steamers anchor about a mile from the shore under shelter of a bluff and are served by cargo boats of a carrying capacity of about two tons each. Owing to the heavy surf communication with ships in the roads is at times fraught with considerable danger. Vizagapatam is the headquarters of a Port Officer and a Customs Collector and there is a lighthouse. The principal exports are manganese (which in pre-war time went chiefly to Antwerp and Baltimore), groundnuts, myrobalans and molasses and there is considerable *cooly* traffic at certain seasons with Rangoon. All foreign imports are transhipped at Calcutta or Madras, none being received direct. 164 steamers with a total tonnage of 390,629 cleared the port in 1913-14, and in 1922-23, 127 steamers with a total tonnage of 311,205.

#### **Bimlipatam.**

The port of Bimlipatam is 21 miles north of Vizagapatam. A good road connects it with Vizianagram, sixteen miles distant on the Bengal Nagpur Railway and another road with Vizagapatam. Apart from a regular *cooly* traffic with Rangoon for the Burma rice harvest there are considerable exports of Bimlipatam jute (*hibiscus cannabinus*), myrobalans, mowra and gingelly seeds. The harbour is an open roadstead and ships lie about a mile off the shore, and loading and unloading is effected by lighters. There are many private *godowns* for storing produce awaiting shipment, but no wharves or cranes. The number of steamers clearing in 1922-23 was 104 with an aggregate tonnage of 252,690, which were engaged in the coasting trade. The foreign trade, never considerable, was practically extinguished by the war.

#### **Gopalpur.**

In the Ganjam district the only port deserving mention is Gopalpur, which is situated ten miles from Berhampur on the Bengal Nagpur Railway. There is no foreign trade but steamers engaged in the *cooly* traffic with Rangoon call at certain seasons.

North of Gopalpur the sea-board for 250 miles is that of Orissa, the maritime trade of which is chiefly inter-provincial and the only ports that deserve mention are Balasore, Chandbali and Cuttack.

#### **Balasore.**

Until the opening up of the country after the great famine of 1866, Balasore, situated on the right bank of the Burabalang River and the headquarters of the district of that name, was the only port of which

Orissa could boast. It was frequented at that time by vessels with cargoes of rice from Madras and with cowries, then largely used for currency, from the Laccadives and Maldives. The port is of historical interest as being one of the earliest European settlements in India, factories having been established here in the 17th century by English, Dutch, French, Danish and Portuguese merchants. The subsequent growth of Calcutta as the chief entrepôt of commerce and the silting up of the river together with the abandonment by Government of its monopoly of the salt trade and manufacture have all contributed to the decline of the trade of the port. The foreign trade is now confined to Ceylon, Mauritius and the Maldives. The chief items of export are rice, dry fish, provisions and spices, while the imports are salt, textiles, metals, mineral oils and tobacco.

#### **Chandbali.**

Chandbali situated on the left bank of the Baitarani River is now usurping the place occupied by Balasore as the chief port of the province. It has a large coasting trade with Calcutta and other Indian ports, while its foreign trade is mainly with Ceylon, the Maldives and Mauritius. The exports consist mainly of rice and the imports are cotton twist, piecegoods, kerosene oil, salt and gunny bags. There is in addition a considerable passenger traffic with Calcutta, which is served by steamers of the India General Navigation and Railway Company and of the River Steam Navigation Company. In the statistical returns of maritime trade, Balasore and Chandbali are treated together. The value of their combined trade in 1922-23 was £228,502, the number of steamers and sailing vessels that cleared being 88 with a tonnage of 21,988.

#### **Cuttack and False Point.**

Cuttack with a population of 51,000 is situated 253 miles from Calcutta at the apex of a triangle formed by the Mahanadi and Katjuri rivers. It is on the main line of railway running between Madras and Calcutta and is connected by canal with Chandbali and False Point, and for statistical purposes is identified with the latter. There is a harbour and lighthouse at False Point, the former consisting of an anchorage, land-locked by islands and sandbanks, with two navigable channels inland. The harbour is safe and roomy, the channel properly buoyed and a soft mud bottom prevents injury to vessels running aground. The port is open throughout the year and a Port Officer and an Assistant Superintendent of Customs are stationed here.

The trade of False Point has always been chiefly coastwise but a not inconsiderable export trade used to be carried on formerly with Colombo and Mauritius in rice and oilseeds. The imports are mainly salt, cotton yarn and twist.

In 1922-23, 2 vessels with a tonnage of 3,488 entered and cleared, and the total value of the trade of the port was £1,157 only, as compared with £121,200 in 1913-14.

### Calcutta.

Calcutta, situated in latitude 22° 33' N., longitude 38° 21' E. on the river Hooghly with a population, including that of Howrah, of about 1,300,000 is the premier city in India and was until 1911, the Imperial Capital. The port serves the great jute, tea and coal industries, the wheat and seeds traffic of Bihar and the United Provinces and generally the agricultural areas tapped by the main lines of the East Indian, Bengal Nagpur and Eastern Bengal Railways and by the numerous waterways connecting the delta with the interior of Bengal and Assam. The total volume of the rail-borne traffic of Calcutta during the last pre-war year amounted to 10,389,000 tons of which 8,605,000 tons were inwards and 1,784,000 tons outwards, while river steamers and country boats brought into Calcutta during the same year an additional 1,126,000 tons. In 1921-22, the total volume for the year amounted to 7,979,000 tons, of which 6,253,000 tons were inwards and 1,726,000 tons outwards, while river steamers and country boats brought in an additional 1,227,000 tons. No later figures are available as the registration of inland trade statistics has been discontinued.

The growth of the sea-borne trade of the port particularly in the ten years preceding the outbreak of war had been very remarkable and is shown in the table below giving the volume and value of merchandise imported and exported. To this progress a set-back, which is reflected in the same table, was caused by the prolongation of hostilities as the situation of Calcutta precluded any military traffic as at Bombay and Karachi from being handled to any considerable extent in mitigation of the effects of the scarcity of private tonnage and of the restrictions imposed upon certain classes of exports and imports and upon shipment of goods to particular destinations. The post war figures show considerable variation and trade has not yet returned to normal levels in all directions but there are indications of an improvement over even pre-war figures in the tonnage and value of miscellaneous exports.

TABLE No. 16.—*Total value of the trade of Calcutta in private and Government merchandise from 1897-98.*

Year.	Value of imports.	Value of exports.	TOTAL.
	£	£	£
1897-98 . . . . .	24,194,556	34,115,694	58,310,250
1902-03 . . . . .	27,206,587	39,222,973	66,429,560
1907-08 . . . . .	44,745,939	52,770,448	97,516,387
1912-13 . . . . .	49,198,270	74,571,532	123,769,802
1913-14 . . . . .	56,548,746	75,000,913	131,549,659
1914-15 . . . . .	47,288,779	52,775,117	100,063,896
1915-16 . . . . .	43,576,434	63,671,836	107,247,270
1916-17 . . . . .	46,211,475	66,787,289	112,998,762
1917-18 . . . . .	47,552,767	62,141,170	109,693,937
1918-19 . . . . .	56,294,737	76,510,900	132,805,637
1919-20 . . . . .	60,187,054	93,850,336	154,037,390
1920-21 . . . . .	81,966,592	74,958,706	156,925,298
1921-22 . . . . .	70,635,859	60,955,127	131,590,986
1922-23 . . . . .	57,011,653	79,881,368	136,893,021

The gross registered tonnage of vessels entering the port has increased ten-fold in the last fifty years. The number of vessels that entered and cleared from the port with cargoes in the foreign trade in 1922-23 was 1,238 with a gross tonnage of 6,828,381, as compared with 999 of 3,077,199 tons burden in the last pre-war year. The principal items in the export and import trade and the volume of the traffic are shewn in the following tables. Shipments of coal which had increased from 7,600 tons in 1882-83 to over 3 million tons in 1913-14 (exclusive of bunker coal and Government stores) fell away thereafter and though there was a temporary recovery in 1920-21 the total for 1922-23 was only 910,000 tons. The movements of rice are entirely dependent on the character of the season and there are therefore large fluctuations as between different years especially on the import side, e.g., over 417,000 tons were imported in 1919-20 as compared with only 66,000 tons in 1922-23.

TABLE No. 17.—Quantity of the principal items of import and export in the trade of Calcutta in 1913-14 and 1922-23.

IMPORTS.			
Quantity. 1913-14.	Particulars of the principal items of trade.	Unit.	Quantity. 1922-23.*
		Tons.	
521,000	Salt . . . . .	"	450,000
475,000	Iron and Steel . . . . .	"	288,000
355,000	Sugar . . . . .	"	175,000
398,000	Rice . . . . .	"	66,000
91,000	Railway Plant, Government Stores, Rolling stock . . . . .	"	111,000
114,000	Timber . . . . .	"	80,000
144,000	Cotton piecegoods . . . . .	"	95,000
70,000	Molasses . . . . .	"	58,000
61,000	Cement . . . . .	"	63,000
42,000	Spices . . . . .	"	40,000
26,000	Other metals . . . . .	"	26,000
12,000	Oilseeds . . . . .	"	2,000
EXPORTS.			
Quantity. 1913-14.	Particulars of the principal items of trade.	Unit.	Quantity. 1922-23.*
		Tons.	
4,056,000	Coal (including bunker coal) . . . . .	"	1,462,000
898,000	Jute, raw . . . . .	"	553,000
856,000	Jute manufactures . . . . .	"	741,000
347,000	Rice . . . . .	"	274,000
226,000	Linseed and other oilseeds . . . . .	"	173,000
133,000	Wheat, barley, maize . . . . .	"	3,000
96,000	Pulses . . . . .	"	70,000
95,000	Tea . . . . .	"	90,000
90,000	Pig Iron . . . . .	"	119,000
74,000	Manganese ore . . . . .	"	365,000
55,000	Hides and Skins . . . . .	"	28,000
44,000	Manure . . . . .	"	33,000
28,000	Raw cotton . . . . .	"	18,000
13,000	Saltpetre . . . . .	"	10,000

\* Figures are subject to revision.

The affairs of the port are administered by a Port Trust, founded in 1870, which is at present composed of a Chairman and Deputy-Chairman and 14 Commissioners, of whom nine are elected and five appointed by Government.

**Administration.** The powers and duties of the Commissioners are prescribed by the Calcutta Port Act III of 1890 but they are also appointed under section 7 of the Indian Ports Act to be conservators of the Port of Calcutta and as such have charge of the navigable channels of the river leading to, as well as within the limits of, the port proper. The Pilot service is controlled by Government but the Commissioners discharge the duties of the Port Approaches department and Harbour Master's department under the control of a Deputy Conservator.

The income derived by the Port Commissioners has more than doubled during the last fourteen years as the following table shows, but equilibrium was only maintained during the war by the imposition of surcharges, and in 1919-20 and again in 1921-22, there were deficits on the year's working.

TABLE NO. 18.—*Income and expenditure of the Port Commissioners from 1909-10.*

Year.	Income.	Expenditure.
	£	£
1909-10 . . . . .	789,101	799,824
1910-11 . . . . .	855,978	854,918
1911-12 . . . . .	904,793	888,028
1912-13 . . . . .	949,754	980,021
1913-14 . . . . .	1,008,552	1,044,097
1914-15 . . . . .	865,350	1,035,959
1915-16 . . . . .	1,062,354	993,800
1916-17 . . . . .	1,048,229	1,042,113
1917-18 . . . . .	1,055,945	1,041,956
1918-19 . . . . .	1,270,588	1,080,922
1919-20 . . . . .	1,490,374	1,503,458
1920-21 . . . . .	1,773,889	1,677,414
1921-22 . . . . .	1,481,136	1,602,637
1922-23 . . . . .	1,765,035	1,743,165

When the Commissioners entered upon their duties in 1870 they took over from Government four jetties and some minor works of improvement of the river banks which formed the foundation of the present inland vessels' wharves. They also leased from Government the Strand bank lands. Together with these assets they accepted liability for a capital debt of £184,000, including the value (£117,700) of the port block made over to them. In the half century that has elapsed extensive properties on both sides of the river have been acquired by and are now vested in the Port Commissioners. The limits of the port which originally extended only from Cossipore to Garden Reach, a distance of about 9 miles, were advanced in 1896 to Budge Budge which is 16 miles below Calcutta in order to include the petroleum depôt at that place, and in 1921 northwards

9 miles to Konnagar. The port includes the jetties which are situated immediately south of Howrah Bridge, the docks at Kidderpore which is practically speaking a suburb of Calcutta, and a number of moorings in the stream where the greater portion of the coasting traffic is dealt with by steamers discharging into and loading direct from boats. The left bank of the river from Cossipore to Kidderpore and the right bank from Messrs. Burn & Co.'s engineering works at Howrah down to the Botanical Garden are practically continuous wharves for the discharge of inland steamers and country boats, and immediately above the Botanical Garden a frontage of 5,000 feet is reserved for timber ponds while further upstream there are a number of bunker coal depôts leased to different concerns with a total river frontage of 2,300 feet and 9 pontoon landing stages.

The foreign import trade of the port is dealt with at the jetties which consist of nine berths with a total river frontage of 4,745 feet but one of these is used by the coasting trade for landing cargoes *ex* boat. Three of the foreign import berths are provided with double-storeyed sheds and the total areas of all the transit heads is 579,600 sq. ft. In addition there are warehouses at the jetties having a total floor space of 324,156 sq. ft. where imported goods, not immediately required, can be stored at package rates or compartments can be hired at monthly rates of rent.

The quays are equipped with 49 fixed and 13 derricking 35-cwt. cranes, with two other derricking cranes of a capacity of 1 ton each and one fixed crane to lift 5 tons. In addition the heavy lift yard at Armenian ghat is provided with a 30-ton Goliath transporter.

During 1922-23, 680,053 tons of goods were landed at the jetties, of which 9 per cent was stored at the jetty warehouses, 67 per cent removed by gates, 23 per cent by rail, and the remaining 1 per cent by boats.

The Kidderpore docks were commenced in 1884-85 and the first vessel entered in 1892. For a long time they were used almost exclusively for exports, but latterly imports of rice and sugar have been dealt with and just previous to the outbreak of war, when the jetties became congested, a few steamers with foreign imports were discharged there. There are 18 berths for general produce and 10 coal berths; two of which are provided with Beckett's mechanical loading plant. To six of the general produce berths are attached two-storeyed transit sheds and the total floor space of the eighteen transit sheds amounts to 852,500 sq. ft.

The total traffic shipped or landed by the Port Commissioners at the docks in 1913-14 amounted to over 4,850,000 tons but there has been a steady falling off during and after the war, and in 1922-23 the total amounted to 2,892,000 tons only.

The 60 ft. lock entrance to the docks will take vessels of 58' 6" beam and 510 feet length. The other entrance, 80 ft. in width, by means of which vessels up to 600 feet in length could be got into No. 1 dock, can only be used at slack water and when the rise of the tide is at least 13 feet above datum, and consequently practically the whole traffic of the

docks is passed through the 60 ft. lock. A new lock entrance 80 ft. width by 550 ft. in length is now under construction.

There are two graving docks inside the Kidderpore docks for the use of ocean-going steamers, while a third small graving dock situated between the two entrances is reserved for the use of Port Commissioners' vessels.

Adjacent to the Kidderpore docks are the Kantapukur grain and seeds depôt with over one million square feet of shed space, where practically the whole of the wheat and seeds export trade is concentrated and where storage accommodation is found for imports of sugar from Java. On the opposite side of the docks are the hide depôts and the tea warehouse, the former with storage accommodation to the extent of one million square feet of space including a covered area of over 360,000 square feet and the latter with 304,000 square feet of accommodation. The new tea warehouse recently erected gives another 283,212 square feet of accommodation. These sheds and warehouses are all owned by the Port Commissioners but a number of industrial trading concerns have rented land from the Commissioners in the immediate neighbourhood of the docks; and there are many indications that the importance of the place as a trade centre will rapidly increase as soon as normal trade conditions are restored.

The petroleum depôt at Budge Budge is situated on land belonging to the Port Commissioners and under their control. Each importing

(3) Petroleum wharf at Budge Budge. company has a separate installation comprising shed accommodation for the storage of oil in tins and cases on the riverside, factory sheds behind, and a back area for the storage of oil in bulk. The total storage capacity of the depôt is in round figures 50 million gallons.

Recently the Tank Storage Company opened a depôt for the storage of petrol in bulk and three tanks with a combined capacity of two million gallons have already been erected, with pipe connections enabling tank steamers to transfer their loads direct into the installations.

The Port Trust Railway runs parallel to the river, behind the jetties and transit sheds from Cossipore to the docks, its function being to

(4) Port Trust Railway. connect up the docks and jetties with the three main railway systems serving Calcutta. Incidentally also it carries a certain amount of local traffic such as baled jute from the press-houses north of the Howrah bridge to the docks.

The total length of railway track, controlled by the Port Trust Railway, including the lines between Howrah and Shalimar on the right bank of the river, is 157 miles with 62 engines and 2,020 covered wagons and open trucks, but a large portion of the traffic is carried in foreign trucks.

The port being separated from the sea by 80 miles of difficult river, highly skilled pilotage is necessary for the entry of vessels for a total distance of about 120 miles. The principal obstacles to navigation are the bars which

(5) River approaches. exist in various parts of the river and which can only be crossed by deep draught ships at or near high water. Considerable improvement of the bars has been effected in recent years by dredging. The average draught of vessels has been steadily increasing, and in 1922-23, 31

vessels drawing more than 28 feet, navigated the river, the deepest draught being 30 feet 4 inches.

Further improvements in the arrangements for the arrival and despatch of vessels have recently been effected by the lighting of a portion of the river. The first section of this lighting scheme, namely, between Mud Point and Saugor, has been in use for some years, both for inward and outward vessels and an extension from Mud Point upwards to Kulpi has just been completed, which facilitates the movement of vessels in both directions.

In December 1913 a Committee was appointed by the Government of Bengal to consider the question of the general adequacy of the arrangement of the port of Calcutta for meeting the rapidly increasing demands of trade.

The Committee had before them a comprehensive scheme which had already been drawn up by the Port Commissioners which they adopted almost in its entirety. The view was taken that only a slight extension of the jetties was practicable while the extension of the Kidderpore docks was considered to be neither practicable nor economical as it would involve the construction of another lock entrance. The future expansion of the foreign import trade would therefore have to be met by the construction of new docks and jetties at Garden Reach just below the Kidderpore docks. As the construction of the entrance to the new dock system would involve considerable delay, the Committee recommended the immediate construction of four riverside berths with large two-storeyed transit sheds at Garden Reach above the proposed site for the new entrance so that the urgent demand for additional accommodation might be met. This latter work was begun in 1914 but was seriously delayed during the War owing to the impossibility of obtaining the necessary materials and it is only recently that the whole series of riverside berths has been completed.

The commencement of work on the new dock system—King George's Dock—was necessarily postponed until after the War, when the Commissioners, after obtaining expert advice both in regard to the engineering and traffic problems involved, commenced work in the year 1920. A great deal has since been accomplished and the construction of the large entrance lock measuring 700 ft. by 90 ft. and of the two dry-docks measuring altogether 1,165 ft. by 80 ft., which also form an alternative entrance, is well in hand, while the work on the construction of the quay walls of the wet dock has made fair progress. It is hoped that the first section, comprising the entrance lock, four general produce berths and the heavy lift yard, may be ready for opening during 1927.

### Chittagong.

The port of Chittagong, with a population of 36,000, is situated in latitude 22° 14' N. and longitude 91° 50' E., 11 miles from the mouth of the Kornafuli River in Eastern Bengal. Though it has been a trading centre since the sixteenth century when the Portuguese frequented it,

it was not until the Assam Bengal Railway was completed in 1895 that its claim to be regarded as the natural outlet for the trade of Assam and north-eastern Bengal was generally recognised. Jute, formerly the chief article of export, was brought down by water to sea-going sailing vessels moored in the stream, while the tea trade was non-existent and the import trade insignificant. At the present time the export trade consists chiefly of jute, tea, rice and paddy. Jute arrives generally ready for shipment by train from Chandpur after being baled there or in Narayanganj, while tea is conveyed from the estate to the nearest station on the Assam Bengal Railway which unloads it directly into transit sheds at the jetties.

The popularity of the port for shipments of tea, which is now the chief export, has developed enormously during recent years, the chief reasons being accessibility, and light handling which ensures the arrival of consignments on the London market in good condition. The foreign import trade which is slowly increasing consists chiefly of salt, for which special storage accommodation to the extent of about 25,000 tons is provided by Government, railway material, tea garden machinery and galvanised sheets.

The present amenities of the port consist of four jetties built by and belonging to the railway, which are fitted with four 10-ton and seventeen other cranes. The railway has also constructed

**Port facilities.** seven sheds, three for storage purposes, which will accommodate 88,500 chests of tea, 37,400 bales of jute and 170,000 bags of rice, while the four transit sheds can take 270,000 chests of tea, 74,400 bales of jute and 176,000 bags of rice. Further space is available for the construction, when funds are available, of three more jetties and a proportionate number of additional cranes, storage and transit sheds. The port has provided fixed moorings for seven cargo steamers and swinging buoys for three more. There are also berths for two tank steamers for the oil trade. Chittagong possesses no graving or dry docks at present but there are engineering works at which minor repairs to ships may be effected. There are several ship-building yards in which during the last two years of the war eight or nine sailing brigs were built.

Before the formation of the existing Port Trust the affairs of the port were administered by an officer who held the combined appointment of Port Officer and Collector of Customs. In

**Port Trust.** 1879 these appointments were separated and the Port Commissioners Act of 1887 having come into force in April 1888, the management of the port changed hands though entire control was not made over to the Commissioners until the 1st April, 1889. The trust at present consists of nine Commissioners, 6 appointed by the Local Government and 3 elected by the same authority in such a way as it might direct, the Commissioner of the Chittagong division being ordinarily appointed the Chairman in addition to his other duties. The Custom House is in charge of an officer of the rank of Assistant Collector in the Imperial Customs service.

The value of the trade of the port has expanded considerably in recent years. In 1890 the foreign trade was valued at £1,006,600 and the coasting trade at £1,106,600 : the revenue of the Port Trust being £3,749. The effects of the completion of the Chittagong-Chandpur section of the Assam Bengal Railway were not immediately operative and the first appreciable advance dates from the opening of traffic of the hill section in 1904 bringing tea gardens into direct communication with the port. The revenue of the Port Trust rose in that year nearly to £8,000 and the value of the total trade, import and export, to £2,746,600. Thereafter progress was steady until hampered by the outbreak of hostilities, the revenue realised by the Trust in 1913-14 being £15,700. The principal sources of revenue till 1904 were Port dues and mooring fees, but in that year river dues on goods were introduced at the rate of 2 annas per ton, later on increased, to meet war conditions, to 4 annas in April 1915, and now standing at Re. 1 per ton. In 1912-13 the proceeds of a special duty on exports of jute\* were handed over to the Port Trust whose income with these two additional sources of revenue has quadrupled in the last quarter of a century.

In common with all the smaller Indian ports the value of the trade of Chittagong and the aggregate tonnage of the steamers entering the port declined considerably in the last two years of the war, but apart from this the financial position of the Chittagong Port Trust is far from satisfactory as it has no reserves or revenue producing expenditure and its income is scarcely sufficient to pay ordinary conservancy charges. There is no surplus from which the interest and sinking fund payments for a loan, to be expended on the new works and improvements so urgently required, could possibly be found. Since 1914 the deterioration of the river has given rise to frequent complaints from ship-owners, traders and the railway administration alike, and until the natural disadvantages under which the port at present labours have been removed, the future of Chittagong is uncertain. A single dredger which is scarcely large enough for the need of the port is constantly at work and though jute and tea are both measurement cargo, steamers are liable to be neaped if they leave fully loaded, except when the tides are favourable. The view is generally held that unless a considerable sum of money is expended on improvements and the river made permanently navigable for the largest class of ocean-going steamers, the port, though it serves a large and prosperous area, has no great future before it. In 1917 Sir George Buchanan was deputed by the Railway Board to advise as to the engineering works and improvements necessary to make the port suitable for accommodating the largest ships and the sum of the expenditure that these works would involve. His proposals excluding the cost of dredgers amounted to £250,000 and there was in his opinion no engineering difficulty in keeping the Kornafuli River permanently open for navigation by the largest ocean-going steamer. The question of the provision of funds for the purchase of adequate dredging plant is now before the Government of Bengal.

**Finances.**

\* In the case of raw jute, two annas per bale of 400 lbs. and in the case of manufactured jute, 12 annas per ton, of 2,240 lbs.

The value of the foreign and coasting trade of Chittagong in private merchandise in 1922-23 was as follows—

TABLE No. 19.—*Value of the foreign and coasting trade of Chittagong in 1922-23.*

Items of trade.	Foreign trade.	Coasting trade.
	£	£
Imports . . . . .	580,000	940,000
Exports . . . . .	3,760,000	1,266,700
TOTAL . . . . .	4,340,000	2,206,700

The corresponding figures for 1913-14 were £4,161,000 (foreign) and £1,686,800 (coasting).

The number of vessels that entered and cleared the port in the foreign trade in 1913-14 was 39 with an aggregate tonnage of 106,012. The corresponding figures for 1922-23 were 35 and 82,780.

There is at present no railway connecting India proper with Burma, but one route *via* Chittagong and an alternative route *via* the Hukong valley have been surveyed. The shortest sea route is between Chittagong and Akyab.

#### Akyab.

Akyab, the headquarters of the Arakan Division, and the only port on the western seaboard of Burma of any commercial importance, boasts five public and thirty-five private wharves. The former are fitted with one 5-ton and one 3-ton crane in addition to two hand cranes. It is the headquarters of a Port Officer who is *ex-officio* the Customs Collector and the population exceeds 30,000. There is a jetty for deep-sea vessels, which can accommodate ships with a draught of 18 feet but the loading and unloading of cargo is usually carried out in the stream. Akyab has no railway communications but the British India Steam Navigation Company used before the war to run a weekly steamer service from Rangoon to Calcutta and back *via* Akyab and Chittagong, calling at two minor ports, Kyaukpyn and Sandoway, between October and April. There is also a launch service owned by the Arakan Flotilla Co., plying between Akyab and other Arakan coast ports, and a large sea-borne trade is carried on by native craft. The principal articles of import are apparel, coal, cordage and rope, while the only exports of importance are rice and paddy.

250 steamers with an aggregate tonnage of 294,220 cleared the port in 1913-14, and 220 steamers with an aggregate tonnage of 368,739 in 1922-23.

### Bassein.

Bassein, the headquarters of the Irrawaddy Division, with a population of 43,000 is situated nearly seventy miles from the sea and is important only as a rice shipping centre. The main branch of the Bassein river is navigable by vessels of a draught of 27 feet and large quantities of rice are loaded during the season by ocean-going steamers. The import trade is unimportant. There is direct railway communication with Rangoon and several river steamer services exist, the most important of which is that run by the Irrawaddy Flotilla Co. There are five public and twenty private wharves for the landing and shipping of goods but the port at present lacks warehouses and cranes and loading is effected entirely in the stream. The Port Officer is also *ex-officio* the Customs Collector.

68 steamers with a tonnage of 192,860 cleared the port in 1913-14 and 53 steamers aggregating 148,005 tons in 1922-23.

### Rangoon.

Rangoon, the capital of Burma and the headquarters of the local Government, with a population of about 342,000, is the chief port of the province of Burma and in the volume and value of its trade the third seaport of British India. It is situated on the Hlaing or Rangoon River about 24 miles from the sea. The only line directly serving Rangoon is the Burma Railway, metre gauge, which connects the capital with Bassein, Henzada, Prome Martaban (for Moulmein), Mandalay and Myitkyina.

The present facilities of the port include 2 wharves of a total length of 2,800 feet, comprising 6 berths, with depths from 20 to 26 feet below

**Port facilities.** low water of spring tides, for ocean-going steamers, 5 pontoons and jetties capable of accommodating ocean-going steamers and 27 pontoons and jetties for inland vessels. The wharves are equipped with fifteen 3-ton hydraulic cranes, sixteen 35-cwt hydraulic cranes and two 7-ton steam cranes. On a jetty is a 30-ton sheerlegs for heavy lifts which is to have its capacity increased to 40 tons very shortly. There are 23 swinging and 14 fixed moorings in the river for ocean-going steamers, 6 of the latter being reserved for oil tankers. The port lacks a dry dock suitable for ocean-going vessels, but in every other respect is well-equipped with modern conveniences for loading and unloading vessels and for the handling and storage of cargo.

The affairs of the port are administered by a Trust consisting of thirteen members, eight of whom are nominated by Government, four elected by the Chamber of Commerce and one by the Rangoon Trades Association.

**Port Trust.** The following table shows the income derived by the Port Commissioners from 1890-91 and the expenditure on the port. It will be remarked that even during the years 1914-15 to 1917-18 when there was a temporary decline owing to tonnage scarcity in receipts, the working of the port continued to show a profit, and the revenue totals for the past two years have been far in excess of anything previously recorded.

TABLE NO. 20.—Income and expenditure of the Rangoon Port Trust.

Year.	Income.	Expenditure.
	£	£
1890-91 . . . . .	70,566	86,164
1895-96 . . . . .	76,524	64,631
1900-01 . . . . .	95,088	92,023
1905-06 . . . . .	127,543	126,458
1910-11 . . . . .	231,090	230,508
1913-14 . . . . .	345,652	248,869
1914-15 . . . . .	302,532	275,322
1915-16 . . . . .	302,512	265,665
1916-17 . . . . .	300,846	259,942
1917-18 . . . . .	275,687	271,680
1918-19 . . . . .	348,481	283,727
1919-20 . . . . .	348,700	299,728
1920-21 . . . . .	364,116	347,470
1921-22 . . . . .	501,261	421,344
1922-23 . . . . .	512,949	439,525

The figures for expenditure exclude sums transferred to reserve funds.

The total liability in respect of borrowings on capital account on the 31st March 1923 amounted to Rs. 3,57,01,262 (£2,380,084). Provision for paying off this liability is made by means of sinking funds. The amount standing at the credit of the sinking fund on the 31st March 1923 was Rs. 1,03,90,568 (£692,705), and at the credit of the reserve fund Rs. 54,07,807 (£360,520).

The value of the foreign and coasting trade of the port in private and Government merchandise as given in the table below, will show how Rangoon has developed during the last 33 years.

TABLE NO. 21.—Value of the trade of the port of Rangoon from 1890-91.

Year.	Import.	Export.	TOTAL.
	£	£	£
1890-91 . . . . .	5,892,533	5,977,866	11,870,399
1895-96 . . . . .	5,765,456	6,762,400	12,517,866
1900-01 . . . . .	7,861,066	11,026,333	18,887,399
1905-06 . . . . .	9,891,400	13,768,933	23,660,333
1910-11 . . . . .	12,013,333	18,559,466	30,572,799
1913-14 . . . . .	16,614,416	20,879,075	37,493,491
1914-15 . . . . .	12,016,432	19,376,888	31,393,320
1915-16 . . . . .	12,541,000	18,260,800	30,801,800
1916-17 . . . . .	14,409,654	21,200,452	35,610,106
1917-18 . . . . .	12,980,133	19,664,200	32,644,333
1918-19 . . . . .	16,766,831	25,530,738	42,297,569
1919-20 . . . . .	20,145,073	32,980,702	53,125,775
1920-21 . . . . .	29,327,724	30,498,916	59,826,640
1921-22 . . . . .	24,576,197	36,591,593	61,167,790
1922-23 . . . . .	28,888,044	36,217,003	65,105,047

The foreign sea-borne trade westward is carried principally by vessels of the Bibby, Henderson, and Ellerman's City and Hall, Hansa and British India lines, while traffic to the Far East is principally in the hands of the British India and Java Bengal lines, the Nippon Yusen Kaisha and Osaka Shosen Kaisha. The British India S. N. Co. also enjoys the bulk of the coasting trade and the Irrawaddy Flotilla Co. operating from Rangoon has almost a monopoly of the very considerable river-borne traffic. The headquarters of the railway and of all other large businesses in Burma are in Rangoon, and about 90 per cent of the foreign trade of the province passes through the port. Of the coasting trade, about 80 per cent of the trade with other provinces and about 40 per cent of the inter-port provincial trade goes through Rangoon. There is a large Chinese trading population in the city and considerable trade is done with the Far East. The principal imports from foreign countries are cotton manufactures, including twist and yarn, metals, provisions and oilman's stores, wines and spirits, silk, sugar, salt, woollen goods, leather goods, glass, cement, bricks and tiles, chemicals machinery and millwork, hardware, and oils, mineral and non-mineral. Rangoon's chief exports to foreign countries are rice, grain and pulse, paraffin wax, hides and skins, cotton, pig lead, zinc concentrates, wood and timber, rice bran, rubber, mineral oils, tobacco and cutch.

In 1922-23, 1,644 vessels with an aggregate tonnage of 3,329,260 entered and 1,658 vessels with an aggregate tonnage of 3,369,545 cleared from the port.

#### Moulmein.

Moulmein, near the mouth of the Salween River, is the largest of the Tenasserim ports and the head-quarters of a Port Officer who is also the Customs Collector. It contains several saw mills and was once the centre of a flourishing ship-building industry, of which there was a partial revival in the last two years of the war. In pre-war times, the British India Steam Navigation Company used to run steamers three times a week between Rangoon and Moulmein and fortnightly along the Tenasserim coast, and the steamers of the Asiatic Steam Navigation Company also called here. The railway from Rangoon has captured much of the sea-borne trade; its terminus being at Martaban, on the opposite bank of the Salween and connected with Moulmein by a steamer ferry service. There are also launch services from Moulmein up the Salween, Ataran and Gyaing rivers. There are sixteen public and forty private wharves for the landing and shipping of goods, but no cranes, and steamers use their own winches and donkey engines to lift cargo. Loading is usually done in the stream off Mupun, about three miles below Moulmein town. The principal imports into Moulmein are apparel, coal, coir manufactures and cordage and rope, while the chief exports are rice, rice bran, teak and jungle wood, lac, hides, fishmaws and cigars. The population exceeds 61,000.

263 steamers with a tonnage of 323,377 cleared from the port in 1913-14, and 116 steamers aggregating 196,963 tons in 1922-23.

### Tavoy.

Tavoy, which is situated about 35 miles from the mouth of the Tavoy River, came into prominence owing to the hectic exploitation, during the war, of the wolfram and tin mining industries. The population, which exceeded 135,000 in 1919 has now fallen to 27,000. In addition to one public wharf there are twelve private wharves for the landing and shipping of goods. The Custom House is in charge of the Deputy Commissioner who is *ex-officio* the Customs Collector. A steamer service between Tavoy and Moulmein is maintained by the British India Steam Navigation Company as far as the mouth of the Tavoy River, which is unnavigable for ocean-going steamers, whence a launch conveys passengers and cargo to the town.

233 steamers with an aggregate tonnage of 175, 833 cleared from the port in 1913-14. The corresponding figures for 1922-23 were 183 and 85,799.

### Mergui.

Mergui is the centre of the Burma rubber and pearl-fishing industry. The area of cultivation under rubber in the district has increased from less than 4,000 acres in 1909 to 17,500 acres in 1922, one-half of which has been tapped. The port possesses two public and four private wharves for the landing and shipping of goods. The Deputy Commissioner, who is in charge of the Custom House, is *ex-officio* the Customs Collector. Exporters for the most part use their own jetties.

The import trade is not of much importance. The principal exports are rubber, tin and pearls. The total number of steamers that cleared the port in 1913-14 aggregated 206 with a tonnage of 144,570. In 1922-23, 180 steamers cleared with a tonnage of 69,693.

### Tonnage clearances with cargoes.

The following table shows the tonnage of steamers and sailing vessels that cleared with cargoes from British Indian ports distinguishing British and British Indian from foreign ships during the pre-war quinquennium and in post-war years.

TABLE NO. 22—*Tonnage of steamers and sailing vessels that cleared with cargoes from British ports from 1909-10 to 1913-14 and from 1919-20 onwards.*

Nationality of the vessels.	Average of 5 years ending 1913-14.	1919-20.	1920-21.	1921-22.	1922-23.
	Tons.	Tons.	Tons.	Tons.	Tons.
British ships, including British Indian.	6,069,000	5,135,000	5,618,000	5,283,000	5,794,000
Foreign ships	1,738,000	1,029,000	1,428,000	1,270,000	1,650,000
TOTAL	7,807,000	6,164,000	7,046,000	6,553,000	7,444,000

The nationality of the vessels that cleared during the same periods is shown separately in the next table. There have been it will be noticed a larger number of Japanese, Dutch, U. S. A., and Italian steamers in recent years, while Austria-Hungary has of course disappeared altogether and Germany and France are much below pre-war levels, though the former is on the up. grade. The figures for France do not, of course include clearances from Pondicherry. The vessels flying the flag of the Chinese Republic are nearly all sailing ships engaged in trade with Burma ports.

TABLE NO. 23.—Nationality of vessels cleared with cargoes from 1909-10 to 1913-14 and from 1919-20 onwards.

Nationality.	NUMBER OF VESSELS.				
	Pre-war† average.	1919-20	1920-21.	1921-22.	1922-23.
British*	2,593	2,312	2,553	2,403	2,450
German	225	..	4	21	43
Austro-Hungarian	119	..	..	..	..
Japanese	62	206	177	149	139
Norwegian	53	45	51	29	39
Dutch	39	31	45	50	81
Italian	36	38	57	49	76
French	28	23	17	5	4
Russian	13	8	4	..	..
Greek	5	7	6	6	23
Swedish	4	12	17	14	22
American	..	39	110	61	84
Chinese	..	11	10	8	4
Other nationalities	9	17	17	8	11
<b>TOTAL</b>	<b>3,186</b>	<b>2,749</b>	<b>3,068</b>	<b>2,803</b>	<b>2,976</b>

\* Including steamers registered in British India.

† 1909-10 to 1913-14.

#### Principal trade centres.

India's foreign trade is to a great extent centred in the five principal ports but though the population is chiefly rural, there are a considerable number of towns in the interior which deserve mention either as distributing or industrial centres. Calcutta is of importance from the latter point of view as the centre of the jute manufacturing industry, all the jute mills in Bengal being situated within its boundaries or within a few miles of them on the banks of the Hooghly. There are several flour and rice mills, a large number of oil mills, iron foundries, tanneries, etc., and the great Tata Iron and Steel Works at Jamshedpur are only about 150 miles away. Though an examination of the share register of the jute mills and other company-owned trading concerns in Calcutta would probably disclose a preponderance of Indian holders, control

with but few exceptions is in the hands of British firms acting as managing agents. The outstanding industrial features of Bombay and its environs are its cotton spinning and weaving mills, 80 in number, and the Hydro-electric works at Lonavla and in the Andhra valley. It is at the same time the chief distributing centre in western India for very large imports of cotton manufactures. A preponderating share of the trade of Bombay is in Indian hands and the majority of the mills are under Indian management. Madras industrially is of no great importance, though it possesses the two most up-to-date cotton textile mills in India. It is not a terminal port and therefore, whenever tonnage is scarce, it is liable to suffer from infrequency of steamers calling. The chief industry of Rangoon is rice milling, but there is also a large export trade in timber and oil and the city is developing rapidly in commercial importance. Though European capital and control predominate, there is a considerable Indian and Chinese element participating in the trade of Rangoon. In Karachi the wheat trade is largely financed by European firms, though Parsees, if to a much smaller extent than at Bombay, have important commercial interests.

Of the trade centres in the interior, Cawnpore in the United Provinces with a population of 216,000, is industrially and commercially of great and growing importance. It is an important railway

**Cawnpore.** junction and its situation about 870 miles from Bombay and 630 from Calcutta has made it a convenient distributing centre for the imports of Manchester piecegoods, hardware and machinery from both these ports, while its factories produce very large quantities of leather goods, woollens, cotton textiles and tents. The city also boasts flour mills, iron foundries, bristle factories and chemical works and there are a number of flourishing minor industries.

Delhi, with a population of 304,000, is now the capital of the Indian Empire. It is the junction for nine railway lines and an important clearing house for the Punjab and the western

**Delhi.** districts of the United Provinces particularly in cotton, silk and wollen piecegoods. There are cotton spinning and weaving mills, a biscuit factory, and several flour mills. It is noted also for its art industries, such as ivory carving, jewellery, lac work, silversmiths' work, pottery and gold and silver embroidery.

Ahmedabad, with a population of 274,000, is, next to Bombay, the most important industrial centre in that Presidency. It contains 71 cotton mills.

**Ahmedabad.** Amritsar, about 30 miles east of Lahore with a population of 160,000, is also of considerable importance commercially. Apart from its entrepôt trade in piecegoods a large business in skins and hides is done here and its carpet

**Amritsar.** industry is well known.

Agra, with a population of 185,000, is, of course, chiefly famous for the architectural monuments of the Moghuls though its manufactures of carpets and *daris*, embroideries, and stone work are considerable. It is also a collecting centre for better qualities of hides.

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Bangalore in the Mysore State has a population of 237,000. It is 219 miles by rail from Madras. Its chief manufactures are carpets,

**Bangalore.** cotton textiles and woollen goods and leather. The Civil and Military Station, which adjoins the city, is an assigned tract under the administration of the British Resident.

Lahore, with a population of 282,000, is the capital of the Punjab and though of small importance industrially, apart from the large workshops of the North Western Railway, it is the chief trading centre for the agricultural

**Lahore.** produce of the province.

Benares, (population 198,000), situated on the Ganges about 400 miles north-west of Calcutta, is the holy city of the Hindus. Commercially it is chiefly of interest on account of the very considerable silk weaving industry established there.

**Benares.**

Lucknow, with a population of 241,000, shares with Allahabad the claim to be the cold weather capital of the United Provinces. Its industries are of small moment but commercially it is of interest as a distributing and collecting centre for the rich agricultural produce of Oudh.

**Lucknow.**

Nagpur, (population 145,000), on the line between Calcutta and Bombay at the junction of the Great Indian Peninsula and Bengal Nagpur Railways, is the capital of the Central Provinces. Its commercial importance is due to its prosperous weaving mills, cotton ginning and pressing factories, and the extensive manganese deposits in the neighbourhood.

**Nagpur.**

Jubbulpore, (population 109,000), an important railway junction linking the East Indian with the Great Indian Peninsula Railway contains a central gun carriage factory, a number of spinning and weaving mills, potter-works, oil and flour mills and a large railway workshop.

**Jubbulpore.**

Mirzapur, in the United Provinces (population 55,000), boasts a considerable brass industry for the manufacture of domestic utensils, but it is mainly important commercially on account of its shellac and carpet factories.

**Mirzapur.**

Madura, with a population of 139,000, is the centre of considerable silk and cotton weaving and dyeing industries and is the second town of importance in the Madras Presidency.

**Madura.**

Lashkar, the capital of the Gwalior State, (population 80,000), contains a number of State-owned factories and is the centre of an important stone quarrying and carving industry.

**Lashkar.  
(Gwalior.)**

Dacca, with a population of 119,000, is the most important city in Eastern Bengal, in the heart of the jute growing districts. Its muslins were formerly famous in Europe and there are still a number of handlooms working in the district.

**Dacca.**

Mandalay, the chief city of Upper Burma, with a population of 149,000, is located about 400 miles north of Rangoon on the Irrawaddy river. In the days of the Burma kings it thrived, but now its trade is declining, though the silk manufacturing industry is still of some importance.

**Mandalay.**  
Srinagar, the capital of Kashmir, with a population of over 142,000, is situated on the Jhelum river. It is famous for its embroideries and carved wood work, and the largest silk filature in India.

**Srinagar.**  
Sholapur and Amraoti are the centres respectively of the cotton industries of the Bombay Deccan and Berar, and other important cities not separately noted are: Hyderabad, the capital of the Nizam's Dominions with a

**Other cities.**  
population of 404,000, the centre of a considerable cotton trade, Allahabad (population 157,000), Jaipur (population 120,000) in the Indian State of the same name, the chief commercial city in Rajputana and famous for its artistic pottery and brassware, Baroda, the capital of the Gaekwar's territory about 245 miles north-east of Bombay, and Mysore the garden city of Southern India with a population of 84,000.

## PART VI

### THE FINANCING OF TRADE.

The bulk of India's external trade is financed by branches of the large British, colonial and foreign exchange banks. The principal exchange banks transacting business in India

**Exchange Banks.** are (1) *The Chartered Bank of India, Australia and China*, with Indian branches in Calcutta, Bombay, Madras, Rangoon, Cawnpore, Delhi, Amritsar, Karachi and Tavoy; (2) *the National Bank of India* with Indian branches in Calcutta, Bombay, Madras, Rangoon, Karachi, Lahore, Amritsar, Delhi, Cawnpore, Chittagong, Mandalay, Tuticorin, Cochin, and Aden; (3) *the Mercantile Bank of India* with branches in Calcutta, Howrah, Bombay, Madras, Rangoon, Karachi, Simla and Delhi; (4) *the Eastern Bank* with branches in Calcutta, Bombay, Madras and Karachi, and also in Baghdad; (5) *the P. & O. Banking Corporation* with branches at Bombay, Calcutta, Karachi and Madras; the head offices of these five banks being in London; (6) *the Hong Kong and Shanghai Banking Corporation* with its head office at Hong Kong, and branches in Bombay, Calcutta and Rangoon; (7) *the Yokohama Specie Bank*, with its head office at Yokohama, and branches in Calcutta, Bombay, and Rangoon; and (8) *the International Banking Corporation* of New York with branches in Calcutta and Bombay.

It is to the Indian branches of these and other similar banking institutions that bills drawn on Indian importers of foreign merchandise will ordinarily come for collection on maturity, being sent to them either direct by the foreign drawer, or by the head office or other branch of the bank which has purchased the bills from him or with which he has arranged a credit; and both in this way and in supplying local knowledge of the reliability and standing of purchasing firms, the Indian branches play a part of considerable importance in the import trade of the country. But it is with the export trade that their operations are chiefly concerned, and the methods which they adopt for financing it deserve explanation in rather more detail.

Except in the occasional years of famine or severe scarcity, the balance of trade is ordinarily, and often very largely, in favour of India; that

**Balance of trade.** is to say, the value of exported produce and merchandise appreciably exceeds the value of imported goods, and consequently the proceeds of import bills received by the Indian branches of the exchange banks for collection are in most years, even when supplemented by the considerable deposits that they obtain, insufficient to provide funds for the purchase of all the exporters' bills offered to them. Normally the gap is filled by the banks in one of three ways. They can place themselves in funds by purchas-

ing the Secretary of State's council bills and telegraphic transfers or by selling to the Government of India sterling drafts drawn in favour of the Secretary of State for India ; by importing sovereigns ; or by importing gold and silver bullion.

In order to meet the heavy obligations of the Government of India in England, the Secretary of State for India sells for sterling rupee bills

**Council bills.** of exchange (usually called council bills) and telegraphic transfers payable by the treasuries in India. Tenders for a stated amount of these bills are invited weekly, and are received each Wednesday at the Bank of England. Allotments are made, up to the amount put up to tender but subject generally to a minimum price, to the highest bidders, and in normal times, and at present, tenders may be submitted by any person. But during the war council bills and telegraphic transfers were only sold to the British exchange banks, and to a few other recognised banks and firms ; and even in normal times the greater part of the weekly amounts offered is generally taken by them.

Occasionally council bills and transfers are procurable on other days than Wednesday, being then termed intermediate bills and transfers, or 'specials ;' and during the war deferred telegraphic transfers, payable in India sixteen days after purchase in London, were issued to counteract the uncertainty of the mails. These 'deferreds' are still obtainable.

Sovereigns are at present legal tender in India at Rs. 10 each and are receivable at Government treasuries and currency offices at this rate

**Import of sovereigns and of bullion.** but they are not issued. As the market value of a sovereign varies between Rs. 15-8-0 and

Rs. 16-8-0, the import of sovereigns like the import of gold and silver bullion is more an ordinary commercial, than an exchange, transaction. From time immemorial there has been in India a keen demand for the precious metals for domestic purposes, jewellery and the like, and the import of sovereigns and of bullion to meet this demand normally operates in exactly the same way as the import of other merchandise to reduce a favourable trade balance ; only, when the exchange banks are the importers, the proceeds of the sale in the bazaar become immediately available to finance exporters' purchases of produce. During the war the import of both gold and silver except on Government account was prohibited, so that this method of settling the trade balance ceased to be available, and both gold and silver had to be sold on import to Government at prices notified from time to time. These restrictions have since been removed and the import of sovereigns and of gold bullion takes a prominent place among the methods of settling the trade indebtedness of other countries to India.

Exporters' bills purchased by the exchange banks instead of being held till maturity are frequently rediscounted on arrival in London, and the banks are thus able to secure a quick turnover of their resources. Indian bills, both import and export, are usually drawn at three months' sight, but bills of four months' usance are not uncommon, and occasionally six months' bills are taken.

The upcountry branches of the exchange banks also engage in the local trade of the places in which they are situated; but their number is not large, and for the most part the finance of the internal trade of the country is in the hands of the Imperial Bank of India, of a certain number of joint stock banks, and of the large class of indigenous bankers variously known in different parts of the country as *shroffs*, *mahajans*, *chetties*, etc. At the head of this system stands the Imperial Bank of India.

The Imperial Bank of India was constituted on the 27th January 1921 by the amalgamation of the three Presidency banks of Bengal, Bombay and Madras under the Imperial Bank of India Act. The Bank carries out the general banking business of the Government of India and holds all the treasury balances of the Government of India at headquarters and at its branches. The total number of branches and agencies of the three Presidency banks prior to the amalgamation was 69. The Bank has undertaken to open 100 new branches within five years of the amalgamation and the total number of branches and agencies at present is 127. The Bank frequently holds the unemployed cash of the local banks, including the exchange banks; it makes advances to them, when necessary, on Government or other securities and in times of stress it comes to their relief if they are in difficulties; it thus occupies the rôle of the 'banker's bank.'

The branches of the Imperial Bank of India share with a certain number of old established joint stock banks, such as the Allahabad Bank and the Central Bank of India, in the development of internal trade. But the banking facilities of the country at large are at present so inadequate that there is room for a large growth in the operations of joint stock banks without any undue curtailment of the sphere of the indigenous banker; and it is the latter who, with the assistance of the Imperial Bank of India, is and will probably continue to be, responsible for a great portion of the internal trade of India.

This trade is financed by the Imperial Bank of India in two ways, either directly by advances against merchandise hypothecated to them, or indirectly through *shroffs* whose *hundis* or internal bills of exchange they purchase. In the latter operation the Imperial Bank of India is at the centre of a web at whose extreme circumference may be found the local dealer in grain. Probably the actual *shroff* from whom a bill is bought will be a man well known to the Bank in a presidency town or one of the larger cities; but he will only have come to the bank for accommodation when he has exhausted his available funds in purchasing or discounting the bills of smaller *shroffs* upcountry, and this process will be repeated possibly more than once, until the village purchaser of grain from a cultivator, the original drawer of the bill, is reached. In the instance taken the bill would be a produce bill, but for approved customers the Imperial Bank of India often discounts pure finance bills, known as 'hand' bills.

The discount or *hundi* rate charged by the Imperial Bank of India generally rises and falls approximately to the same extent and at the same time as the bank rate.

The principal clearing houses in India are those situated at the presidency towns of Calcutta, Bombay, Madras, Rangoon, and at Karachi. The Imperial Bank of India, the exchange banks and most of the English banking agency firms and the better known local joint stock banks at these places constitute the membership of these clearing houses, but no bank as of right is entitled to be a member unless approved by the rest. The Imperial Bank of India at Calcutta, Madras, Bombay, Rangoon, and Karachi performs the functions of settling bank at the centres named.

The following table shows the total amount of cheques cleared annually at the five clearing houses. The hectic trade boom of 1920 is strikingly reflected therein.

TABLE No. 24.—*Total amount of cheques cleared annually at clearing houses from 1907 onwards, in thousands of pounds.*

Year.	Calcutta.	Bombay.	Madras.	Rangoon.	Karachi.	Total.
	£	£	£	£	£	£
1907 . . .	149,627	84,300	10,320	(a)	3,533	247,780
1908 . . .	141,873	83,900	11,693	(a)	4,287	241,753
1909 . . .	131,840	95,833	12,987	(a)	4,680	245,340
1910 . . .	148,253	111,013	14,100	31,787	5,020	310,153
1911 . . .	171,753	117,367	13,993	36,993	5,000	344,106
1912 . . .	192,207	137,040	14,247	40,287	7,640	391,421
1913 . . .	222,013	146,200	15,707	41,320	8,327	433,567
1914 . . .	186,873	115,353	14,240	33,260	8,760	358,486
1915 . . .	215,113	111,253	12,813	27,127	9,107	375,413
1916 . . .	320,113	160,340	16,633	32,353	10,020	539,459
1917 . . .	314,620	224,360	15,227	33,107	13,513	600,827
1918 . . .	496,113	355,747	16,373	46,180	16,193	930,606
1919 . . .	601,660	505,547	20,087	58,913	14,793	1,201,000
1920 . . .	1,022,593	929,293	61,447	71,860	21,253	2,086,446
1921 . . .	611,147	598,007	26,067	79,167	23,660	1,338,248

(a) Figures not available.

## PART VII

### IMPORT TRADE

The outstanding feature of India's foreign trade from the earliest times has been her absorption of the precious metals. The commercial trend has always been towards the West but from the days of the Roman Empire until the enterprise of the East India Company more or less stabilised the sea route round the Cape, exchanges were mainly confined, owing to the difficulties of land transport, to articles of high value and comparatively small bulk, such as costly muslins, silks, ivory and precious stones. With the application of steam to sea traffic and the opening of the Suez Canal the character of the trade was permanently changed and the greater part of India's international exchanges are now concerned with raw materials of considerable bulk and comparatively low value. In the fifty years prior to the outbreak of the great war the excess of exports over imports was persistent. During the first four periods, for which figures are given in the table below, the excess was equivalent to 29 per cent and in the twenty years ending 1913-14 to 19 per cent. This difference was maintained during the war as well as in 1919-20, for though the high sterling value of the rupee encouraged imports, there were buyers to take exports consisting almost entirely of raw materials regardless of cost. Early in 1920-21 the inevitable reaction set in. The United Kingdom, the United States of America and Japan, the best customers for India's exports, showed signs of satiety, and owing to the partial failure of the monsoon in 1919 the embargo on the export of food grains could not be wholly withdrawn. The total volume of imports exceeded that of exports by £58,932,425 and in the following year by £30,781,115. In 1922-23, import trade, except as regards the precious metals, was stagnant until unsold stocks had been cleared, while conditions were favourable for great developments on the export side, had the European markets been able fully to respond. The principal reason, however, for the excess of exports over imports, amounting to £6,211,237, was the general fall in prices of imported articles, while the level of export values showed little change.

TABLE NO. 25.—Foreign trade of India (quinquennial averages) from 1864-65.

Year.	IMPORTS.	EXPORTS.*
	Value in £	Value in £
1864-65 to 1868-69 . . . . .	32,880,000	38,440,000
1869-70 to 1873-74 . . . . .	27,566,666	38,560,000
1874-75 to 1878-79 . . . . .	32,146,666	42,086,666
1879-80 to 1883-84 . . . . .	41,213,338	53,606,666
1884-85 to 1888-89 . . . . .	50,086,666	60,186,666
1889-90 to 1893-94 . . . . .	59,133,333	72,446,666
1894-95 to 1898-99 . . . . .	59,040,000	75,953,333
1899-1900 to 1903-04 . . . . .	73,793,333	91,046,666
1904-05 to 1908-09 . . . . .	104,000,000	116,895,167
1909-10 to 1913-14 . . . . .	132,580,000	165,034,866
1914-15 to 1918-19 . . . . .	132,213,782	155,420,520
1919-20 to 1922-23 (four years)	217,657,955	205,075,739

\* Including re-exports.

In the first century A.D. in return for her exports of spices, precious stones and cotton fabrics of the finest texture, India received corals, copper, tin and lead as well as the precious metals and until the seventeenth century these items predominated in the import list. The early history of the East India Company is a struggle against bitter opposition, based on the fact that the trade with the East Indies involved the export of bullion from England and did not sufficiently enlarge the market for the latter's woollen manufactures, and to silence this opposition as far as possible the Company had to export woollen goods in excess of the Indian demand and to sell them at a loss. Until the spinning jenny was invented, no European looms could compete with those of Dacca and Surat, but the import of cotton goods from India was banned by one Act inimical to the English wool trade and later by another as threatening the infant Manchester weaving industry. The Home Government looked to the East India Company to supply saltpetre for its gunpowder and hemp for its shipping, but the Indian silk industry had considerable ups and downs. In the first half of the eighteenth century exports of bullion from England to India aggregated 27 millions, while the value of merchandise exported was only 9 millions. A great change was effected by the battle of Plassey when the Company acquired control of the revenues of Bengal. Between 1760 and 1809 the total exports of bullion amounted to £14½ millions only, while the value of merchandise shipped to India increased to £48½ millions. The first half of the nineteenth century witnessed a remarkable change in the character of the trade between India and England. Henceforward India began to receive those very commodities as imports which had hitherto bulked so largely in her export trade, viz., cotton manufactures and sugar. The Lancashire cotton industry had so developed that by the middle of the century imports of cotton piecegoods represented about half the total imports of foreign merchandise into India. In 1869-70, of a total of £21,946,660 cotton manufactures accounted for £10,846,660, almost all from the United Kingdom. The next most important single item was the head which includes wines, beer and spirits which amounted

to more than £1,000,000, followed by copper for domestic utensils £906,660, iron and steel £873,330 and salt £500,000. Sugar had then scarcely begun to take its curiously prominent place among the imports into the greatest sugar producing country in the world but in the next half century, the value of arrivals of sugar increased from £476,660 to £5,000,000 and now exceeds £10,000,000 annually. Other classes of imports which have increased in volume and importance in recent years have been mineral oil (kerosene), which has superseded to a great extent vegetable illuminants even in remote bazaars upcountry, matches, and provisions while the arrivals of spices have reached nearly four times the level of India's exports of the same commodities. Though progress was suspended temporarily by the war, the most striking features of recent years have been the greater volume of imports of machinery, railway material, and motor vehicles, while some satisfaction may be derived from an appreciable falling off in the quantity of hardware, and iron and steel in the last two years.

TABLE No. 26.—*The principal articles of importation into India for 1913-14 and 1918-19 to 1922-23 and their values.*

Name of the article.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	£	£	£	£	£	£
Cotton manufactures—	44,199,510	40,369,871	39,336,193	68,080,020	37,968,703	46,763,469
Grey piecegoods.	16,966,515	15,729,434	15,011,856	17,684,673	15,100,783	20,296,350
Coloured piecegoods.	11,907,883	7,879,640	8,600,092	23,045,597	5,062,692	8,400,222
White piecegoods.	9,523,204	8,758,647	10,642,225	14,596,677	8,445,516	10,007,778
Twist and yarn.	2,775,163	5,910,899	2,906,808	9,052,223	7,674,319	6,172,322
Other sorts.	3,025,045	2,096,251	2,325,719	3,750,850	1,574,993	1,876,799
Iron and Steel.	10,871,928	8,290,919	10,884,243	20,862,682	14,094,038	12,248,987
Sugar.	9,971,251	10,409,094	15,328,441	12,335,316	18,335,217	10,325,968
Railway material.	6,680,734	605,659	3,058,184	9,420,330	12,007,076	7,372,168
Machinery and Mill-work.	5,172,206	3,335,697	6,012,127	14,917,151	22,896,720	16,640,727
Mineral oil.	2,743,764	2,408,790	6,176,643	5,560,613	4,892,911	4,534,874
Hardware.	2,632,089	2,138,897	2,910,313	6,055,891	3,946,027	3,432,690
Woolen manufactures.	2,568,168	1,440,492	1,065,681	3,086,891	819,124	1,010,429
Silk manufactures.	2,067,553	2,472,674	3,949,551	3,728,751	1,991,370	2,110,298
Provisions and Oil-manstoves.	1,649,087	1,292,074	1,939,408	2,406,406	1,802,417	1,848,692
Copper (excluding ore).	1,378,852	457,538	1,401,411	1,788,292	826,675	1,817,044
Glass and Glass-ware.	1,296,853	830,711	1,332,063	2,250,788	1,483,296	1,730,682
Instruments and Apparatus.	1,214,014	1,446,351	1,479,829	3,874,099	3,432,035	2,101,026
Shoes.	1,154,875	1,606,131	1,510,197	1,273,859	1,283,985	1,035,643
Apparel.	1,140,992	1,223,173	1,056,934	2,175,233	750,825	727,359
Haberdashery and Millinery.	1,066,551	710,577	645,683	2,012,583	419,599	620,146
Paper and Paste-board.	1,058,454	1,813,779	1,563,048	4,869,952	1,560,768	1,857,782
Motor cars and cycles.	1,022,042	259,261	2,618,962	8,228,863	1,923,732	1,699,900
Dyeing and Tanning substances.	942,633	1,059,951	1,259,295	2,492,415	2,136,776	1,859,330
Spirits.	852,870	1,495,902	1,425,996	2,190,723	1,595,985	1,521,889
Silk (raw).	839,309	693,575	1,189,631	1,110,165	961,532	1,046,843
Drugs and Medicines.	780,490	977,932	1,216,643	1,468,551	1,036,816	1,107,237
Fruits and Vegetables.	758,563	621,101	1,264,021	1,118,826	1,120,021	1,223,317
Precious stones and Pearls, uncut.	714,693	252,345	353,278	489,813	460,830	1,504,907
Carried over.	102,576,361	86,319,404	109,029,270	189,206,998	138,244,459	125,253,669

TABLE NO. 26.—The principal articles of importation into India for 1913-14 and 1918-19 to 1922-23 and their values—contd.

Name of the article.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	₹	₹	₹	₹	₹	₹
Brought forward	102,576,361	86,319,404	109,029,270	182,205,993	138,244,459	125,253,059
Coal, Coke and Fuel	710,920	156,933	85,705	202,458	3,900,318	2,140,799
Building and Engineering materials.	707,130	645,535	826,537	1,505,908	1,337,926	1,036,773
Aniline and Alizarine dyes.	609,915	779,566	922,870	1,575,601	1,947,040	1,636,781
Chemicals . . .	676,506	1,661,710	1,073,670	1,774,280	1,272,509	1,344,696
Matches . . .	597,651	1,098,358	1,365,549	1,113,425	1,858,698	1,078,711
Salt . . .	584,432	1,554,018	1,395,327	1,520,897	1,011,204	1,125,324
Paints and Painter's material.	645,659	845,429	871,424	1,301,445	856,406	917,991
Tobacco . . .	501,923	1,439,736	1,345,771	1,972,749	1,100,354	1,504,407
Soap . . .	500,400	667,424	814,375	939,542	599,173	759,545
Timber . . .	497,553	431,819	817,551	679,003	555,985	305,956
Stationery (excluding paper, etc.).	466,523	469,447	521,094	1,214,303	609,159	611,031
Beer, Ale and Porter.	439,365	461,137	518,691	672,451	652,697	559,077
Rubber . . .	352,961	628,174	1,110,943	1,630,379	1,029,227	1,201,339
Tea chests . . .	349,435	606,736	454,559	351,543	392,238	417,095
Belting . . .	251,637	557,549	360,537	973,975	672,540	554,940
Roses . . .	237,934	232,277	102,552	252,123	133,204	163,572
Cutlery . . .	188,823	127,980	226,007	368,027	112,153	154,329
Grain, Pulse, etc.	185,630	749,030	2,069,394	33,747	6,237,230	362,135
Cotton, raw . . .	181,319	802,663	451,876	1,129,990	2,295,223	1,155,623
Carriages and Carts	169,169	71,997	190,333	549,318	422,203	201,255
Grand Total (including all other articles).	122,165,268	112,669,423	138,648,263	223,732,561	177,664,222	155,138,460

Though the innate conservatism of the bazaar tends to maintain the markets for particular brands and classes of goods there is little evidence, in the records of Indian trade, of discrimination in favour of, or against the goods of any particular country.

**Cotton manufactures.** The traditional customs of the greater portion of the Indian population contend to stereotype the demand for particular classes of cotton manufactures which admit of little variation. The unbleached *dhooti* and *sari* which are worn by so many millions are the staple articles of import from Manchester. An improvement recorded in recent years in the imports of white and coloured goods, may point to a slow but definite change in the public taste, but is probably more correctly ascribable to the more effective competition in Bombay mills in the production of grey goods of qualities superior to the *T cloths* and *domestics* in which they formerly specialised. The local character of the factors affecting the distribution is emphasized by the fact that Calcutta, the port which serves Bengal, Bihar and the eastern half of the United Provinces and Central Provinces, as well as participating in the rationing of the big upcountry entrepôts of Delhi and Cawnpore, continues to import a preponderating quantity of unbleached goods. In this connection it may be noted that the share of the United Kingdom in the import of grey goods fell from 98.8 per cent in 1913-14 to 89.5 per cent in 1922-23 while that of Japan rose from 5 per cent to 9.6 per cent. No less than 66 per cent of the total imports of cotton manufactures into Calcutta in 1913-14 were unbleached goods

in a year when her total imports of cotton manufactures represented one half of the imports for all India and in 1922-23 the percentage was 77. Madras, like Bengal, also exhibits a marked preference for the unbleached article but the figures for Karachi in 1922-23 are 66 per cent for white, 22 per cent for coloured and 11 per cent only for grey. The Rangoon market is *sui generis*. The Burman prefers to wear a lower garment of coloured silk but for work-a-day use he is content with a cotton substitute which, custom demands, should be coloured and the proportion of coloured piecegoods in the total volume of imports was 50 per cent in 1913-14, of white which is required by the emigrant Indian population, 25 per cent, and of grey 10 per cent. The corresponding percentages for 1922-23 were 49, 32, and 19, respectively.

In 1897-98 the total imports of sugar were 212,000 tons, of which just over half was shewn as beet sugar. The countervailing duties

imposed in 1899 and enhanced in 1902, to  
**Sugar.** prevent the ruin of the cane sugar industry by  
 bounty-fed beet sugar, did not diminish the total volume of imports, for as the supply of beet sugar declined, its place was taken by cane. Mauritius, which already supplied more than any other individual country, nearly doubled its shipments by 1903-04, while in the same period Java made a very remarkable advance, increasing its supplies from 7,000 tons to 56,000 tons. Java continued its progress during the next ten years, and in 1913-14 sent 583,000 tons out of total imports of 803,000 tons; Mauritius contributing 138,000 tons only and, although the countervailing duties had meanwhile practically become a dead letter owing to the adherence of most countries to the Brussels Convention, the imports of beet sugar from all sources only amounted to 75,000 tons. Since, as during the war, Java has maintained its position as chief supplier. In 1921-22, 623,300 tons out of 717,600 tons came from this source, the corresponding figures for 1922-23 being 371,000 tons and 442,400 tons, respectively. Until February 1921 Mauritius sugar supplies were under control and shipments from that island during the last four years have only averaged 32,000 tons. Ten thousand tons of Cuban sugar were imported in 1922-23 *via* the United States of America and sixteen thousand tons of beet sugar.

Bengal with its jute mills and its collieries and Bombay with its cotton mills divide between them the greater part of the imports of iron and steel  
**Iron, steel and machinery.** and machinery and mill-work which when war broke out had assumed a position only second to that held by cotton manufactures in India's import trade, and it is no matter for surprise that these classes of imports have during the last three years bulked largely in the table. The author of the 'Review of the Trade of India for 1903-04' remarked that the importations of iron and steel in that year totalling 459,155 tons constituted an advance of nearly 85 per cent on the figures for 1898-99, which he described as a 'year of normal trade.' In the face of this it is interesting to note that ten years later in 1913-14 the total had risen to 1,015,512 tons. More than a quarter of this consisted of galvanized sheets, the predilection for which in building

especially for roofing sheds and warehouses, is patent to anyone who travels in India. In value but not in volume, imports of iron and steel have passed pre-war levels. The practical cessation of all supplies from the United Kingdom persisted until 1920-21, but in the last two years there has been a remarkable recovery, and the ambitious programme for rehabilitating the railways points to great developments hereafter under the head of "railway materials." Imports of machinery and mill-work had in 1913-14 a value twice as high as in 1903-04, yet in 1921-22 the total was again 450 per cent and in 1922-23, 300 per cent higher, which, even allowing for the rise in prices meanwhile, constitutes an appreciable advance in volume.

Silk goods are so generally used by the Burmese of both sexes for personal adornment that the imports of that commodity into Burma to some extent reflect the material prosperity of that province. Bombay is, however, by far the biggest market for imported silk manufactures, of which Bengal, Sind and Madras take little. The value of the imports of raw silk has considerably advanced since 1918-19. The chief item which shews Madras in a place much higher than its general position is that of spices, principally betel-nuts.

Regarding private trade as a whole, its division between provinces (including treasure with merchandise) in 1913-14 was as follows :—Bombay 43 per cent, Bengal 35 per cent, the balance falling in nearly equal shares to the other three maritime provinces. But Bombay's figures include practically the whole of the imports of treasure, and if the figures of private merchandise alone are taken, the apportionment should be :—Bengal 39 per cent, Bombay 34 per cent, Madras, Sind and Burma 9 per cent each. Bengal was the chief importer of salt, and Burma next, the other maritime provinces relying practically entirely on indigenous supplies. The corresponding percentages for 1922-23 are :—Bombay 38 per cent, Bengal 36 per cent, Sind and Madras 9 per cent each, and Burma 8 per cent. A striking feature of the trade of Burma is the relatively large quantity of provisions and silk manufactures which it imports. The fact that that province took more than half the total Indian imports of milk and butter may be attributable to the national aversion from keeping milch cows, but as an importer of biscuits and canned and bottled provisions, as well as of other luxuries, Burma takes a position quite out of proportion to its population, which can only be ascribed to a higher standard of living and to a greater freedom from oriental conservatism.

India's legitimate import requirements were starved while the war lasted, and in many directions return to peace conditions was slow. Comparisons between pre-war and post-war trade are vitiated to a great extent by the rise in prices which are still much above the levels of 1913-14. A general decline in the volume of imports of cotton piecegoods is noted (though a considerable recovery was made in 1922-23) which may be attributed in part to other than economic causes. In the last two years transport difficulties

and the increased cost of Indian coal have encouraged abnormal importations of foreign coal. Of 882,000 tons imported in 1922-23, 497,000 came from the United Kingdom and 254,000 from Natal, 70 per cent of the whole going to Bombay. In 1918-19 only 400 motor cars were imported. The figures for 1919-20 were 9,925 and in 1920-21, 15,432. The market became in consequence heavily overstocked and the totals for the last two years have been 2,895 and 4,323 only. A considerable advance in imports of chemicals may be explained as due to the development of internal industries which require these articles for their processes; matches registered an advance in quantity and value but not in quality; while the improvement in tobacco should be ascribed to the increasing consumption of cigarettes by the civil population. Owing to the failure of the Northern India wheat crop in 1920, 440,000 tons of wheat valued at over £6,000,000 were imported from Australia and U. S. A. Pacific ports in 1921-22.

Perhaps the most interesting reflection of the war upon India's import trade is to be found in the redistribution of the business between

Origin of imports. various countries participating before and since.

TABLE NO. 27.—General distribution of import trade showing the percentages borne by the principal countries in the imports of merchandise into India in 1913-14 and from 1918-19 onwards.

Name of country.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
United Kingdom . . . . .	64.1	45.5	50.5	61.0	50.7	60.2
Germany . . . . .	6.9	..	-.02	1.4	2.7	5.1
Java . . . . .	5.8	6.6	9.4	4.7	9.9	5.5
Japan . . . . .	2.6	19.8	9.2	7.9	5.1	6.2
United States of America . . . . .	2.6	9.5	12.1	10.5	8.1	5.7
Belgium . . . . .	2.3	-.803	-.3	1.6	2.0	2.7
Austria (a) . . . . .	2.3	..	-.06	-.2	-.1	-.1
Straits Settlements . . . . .	1.9	3.3	2.9	1.4	1.5	1.9
France . . . . .	1.5	1.1	-.9	1.1	-.8	-.8
Mauritius . . . . .	1.4	1.5	-.6	-.3	-.8	-.4
Italy . . . . .	1.2	-.5	-.7	1.2	-.7	-.9
China . . . . .	-.9	1.4	1.8	-.9	-.98	1.2
Holland . . . . .	-.8	-.1	-.5	-.9	-.9	-.9
Australia . . . . .	-.5	1.3	1.6	-.4	3.5	-.4
Hongkong . . . . .	-.5	1.0	1.3	-.7	-.6	-.6
Persia . . . . .	-.4	-.6	1.1	-.4	-.6	-.8
Ceylon . . . . .	-.4	1.7	1.2	-.6	-.5	-.6
Russia . . . . .	-.03	-.003	-.07	-.06	-.02	-.006

(a) Figures prior to 1921-22 represent Austria-Hungary.

The country of import for the purpose of the above table is the country from which the goods have come whether by land and sea or sea only,

without interruption of transit save in the course of transhipment or transfer from one means of conveyance to another.

Even before the war the margin by which the United Kingdom had dominated all other competitors had been subject to gradual reduction. In 1853-54 the United Kingdom sent nearly 76 per cent of the whole imports, foreign as well as coasting, into Bengal, China coming next with 5 per cent and 'New Holland' (Australia) with 4 per cent, while France with 3½ per cent was practically the only European competitor, shipments from Antwerp and Cadiz being very small, from Hamburg even smaller, and from Rotterdam non-existent. Fifty years later, the United Kingdom in 1903-04 supplied 64.9 per cent of the foreign imports, Belgium coming next with 3.9 per cent, and Germany with 3.4 per cent; while Russia's percentage was 2.9, that of Austria-Hungary 2.6, of France 1.9, and of the United States and Japan 1.5 each. Ten years later again in 1913-14, as the above table shews, the United Kingdom still retained its position almost unchanged, Belgium's share had fallen to 2.3 per cent and Russia's had become negligible, while Germany's percentage had grown to 6.9 and the United States and Japan had progressed *pari passu* to 2.6 per cent each. The increase in the trade with Germany was attributed partly to the special technical skill which that country developed in certain lines and partly to the displacement of expensive British goods by cheaper substitutes more readily absorbed in the bazaar. The latter advantage passed after the outbreak of war to Japan and the great benefit, which that country was able to secure from war conditions, is amply illustrated in the percentages for 1918-19 in the above table. As for the United Kingdom the steady decline in its predominance arose directly or indirectly from the same causes, the diminution in the volume of some exports from that country being due to the Home Government's control and of others to the restrictive effect of high prices. Japan and the United States of America owe their advance between 1913-14 and 1918-19 principally to the fact that Indian importers of iron and steel and other hardware were perforce compelled to turn to one or other of these countries to replace the supplies which they could no longer obtain from England. Other heads under which imports from Japan made a great advance on pre-war figures are glass and glassware, cotton piecegoods with paper and paste-board, while large quantities of dyestuffs came in from the United States. The share of the United States in the import trade, although still considerably greater than formerly, has shown a steady decline since the Armistice, dropping from 8.1 per cent in 1921-22 to 5.7 per cent in 1922-23. The share of Japan, which made a slight recovery in imports from 5.1 per cent in 1921-22 to 6.2 per cent in 1922-23, also shews a very marked decline, as compared with the percentage for 1918-19, though still nearly treble the pre-war average. Germany, on the other hand, has recorded substantial progress, particularly in 1922-23, when sterling credits were employed to advantage in extensive purchases of copra and other raw material, but the 1913-14 level has not yet been recovered. It is worthy of remark that Belgium has practically recovered its old share of the trade, while France and Italy have even more modest places in the list than in 1913-14.

## PART VIII

### EXPORT TRADE

A brief survey of the early history of Indian trade having been made elsewhere, and detailed references to the case of particular exports

being subjoined (*vide p. 110 et seq.*), it is only necessary to say in general terms that with the growth of mechanical aids to manufacture in Europe, India has since the beginning of the nineteenth century come to be regarded like Argentina chiefly as a producer of primaries. In a year of seasonal prosperity India is able to grow wheat and rice in excess of the needs even of her vast population, and her shipments of food grains with those of raw cotton, raw jute, raw hides and skins and oil seeds constitute one-half of her total exports. The principal exceptions to this classification are jute manufactures, which during the war took an increasingly prominent place in the table, and East India 'kips' (partially tanned hides). During the war circumstances and policy encouraged larger exports of manufactured or partially manufactured goods, and in the post-war boom of 1920-21 the percentage of exports of private merchandise, falling under this category, reached its peak, but has since declined to approximately pre-war levels. In the following table the values of the principal articles of Indian merchandise exported from India are shewn in 1913-14 and for the years 1918-19 to 1922-23. Raw cotton is now the most important single item in the list and other articles which have markedly improved their position are jute manufactures, tea, metals and ores and lac.

TABLE NO. 28.—*Exports of principal articles of Indian merchandise and their values for 1913-14, and from 1918-19 to 1922-23.*

Articles.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	£	£	£	£	£	£
<b>Jute—</b>						
Raw jute	20,550,929	8,480,052	16,466,301	10,907,243	9,366,100	15,018,976
Jute manufactures (including and yarn).	18,948,759	85,101,466	83,343,842	85,329,787	19,997,146	26,906,101
<b>Cotton—</b>						
Raw cotton	27,861,655	20,655,709	89,101,601	27,752,506	35,978,853	47,816,225
Cotton manufactures (including and yarn).	8,079,972	9,380,216	18,275,550	12,180,885	10,433,811	8,708,125
Carried over	74,841,816	73,597,448	107,187,094	86,170,421	75,775,916	98,039,427

TABLE No. 28.—Exports of principal articles of Indian merchandise and their values for 1913-14, and 1918-19 to 1922-23—contd.

Articles.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	₹	₹	₹	₹	₹	₹
Brought forward	74,841,315	72,567,448	107,137,094	86,170,421	75,775,916	99,039,427
Grain, Pulse and Flour.	30,094,279	26,710,384	10,097,161	17,999,601	19,993,168	23,317,648
Rice not in the husk.	17,599,582	15,310,023	6,007,666	11,928,021	16,374,720	23,133,212
Wheat and wheat flour.	9,599,639	5,045,093*	1,122,555*	4,471,555*	2,381,455*	2,222,941*
Barley	1,043,799	1,845,110	17,994	91,847	135,749	127,588
Pulse	711,009	440,745	210,387	290,068	358,530	628,079
Milleta (Jowar and Bajra).	576,164	56,182	112,972	155,228	51,593	151,024
Gram	415,104	2,233,414	73,589	76,948	71,883	214,371
Maize	13,960	104,832	6,828	27,081	10,472	151,316
Oats	3,391	5,409	12,675	15,037	6,767	11,488
Seeds	17,116,259	7,473,993	17,612,600	11,223,186	11,604,828	12,236,391
Linseed	4,457,998	4,391,402	6,977,962	4,095,829	2,866,808	4,902,398
Groundnut	3,254,245	249,891	2,820,645	1,901,061	4,174,647	5,044,033
Rape	2,851,711	906,811	2,646,725	3,527,111	2,111,823	2,721,151
Sesamum	1,796,841	47,076	1,562,367	310,903	632,445	727,020
Cotton	1,416,743	11,810	2,437,085	690,997	664,395	1,314,867
Castor	1,386,649	1,534,228	154,227	234,104	669,824	1,222,482
Copra	1,039,826	13,990	334,559	97,639	82,130	338,963
Mowra	363,634	15	32,292	56,255	10,300	236,308
Poppy	310,569	50,336	245,505	108,498	138,126	90,825
Mustard	70,724	48,817	103,701	34,771	15,303	79,615
†Tea	55,002	14,509	9,727	10,979	5,152	3,735
Niger	42,926	492	10,855	1,039	6,304	18,926
Coriander	39,099	65,847	83,151	71,570	62,388	115,584
Cumin	30,495	50,499	53,827	42,206	44,038	152,342
Ajwan	2,983	2,102	623	5,902	17,098	19,851
Tea	9,983,372	11,850,404	13,710,031	8,099,843	12,146,794	14,698,359
Hides and Skins and Leather.	10,646,737	12,694,519	24,030,699	6,695,254	6,676,730	7,344,492
Hides, raw	5,530,638	1,742,736	5,501,599	1,334,383	1,209,037	1,451,259
„ tanned	1,058,575	4,744,979*	5,252,798	765,540	972,124	1,548,178
Skins, raw	2,280,244	4,481,107	10,033,037	2,156,636	2,770,841	2,841,609
„ tanned	1,758,591	1,701,428	3,118,035	1,349,367	1,641,708	1,828,214
Opium	2,230,031	2,068,049	1,306,841	1,984,074	1,360,485	1,632,492
Wool—						
Raw wool	1,669,646	3,594,992	2,675,122	1,504,737	1,666,406	2,942,384
Wool manufactures	167,349	117,032	449,214	562,817	475,443	656,092
Carried over	146,801,688	138,129,728	177,018,832	132,040,592	129,728,560	171,762,135

\* Including exports on Government account.  
† For details see under article on Tea.

TABLE NO. 28.—Exports of principal articles of Indian merchandise and their values for 1913-14, and from 1918-19 to 1922-23—contd.

Articles.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	£	£	£	£	£	£
Brought forward	146,801,688	188,129,726	177,018,832	182,040,592	129,738,560	171,762,186
Metals and Ores	1,462,994	2,104,146	1,701,794	2,833,697	2,369,325	3,224,579
Manganese ore	808,763	501,538	479,046	1,186,549	834,125	1,148,672
Tungsten ore	..	751,840	†	†	†	†
Iron or steel (including iron ore).	800,970	87,766	812,161	398,260	377,841	682,034
Lead	59,309	287,122	302,581	648,696	745,723	981,153
Zinc, all sorts	31,796	..	153	15,071	30,008	76,303
Chromite	9,205	82,046	21,743	87,470	50,682	114,444
Lac	1,310,535	1,965,640	4,842,478	5,055,053	5,277,210	6,848,440
Coffee	1,024,402	795,856	1,142,630	953,120	927,202	824,057
* Oilcakes	920,240	562,941	1,223,360	777,557	910,449	1,148,199
Wood and Timber.	714,692	472,617	973,853	843,351	425,216	613,648
Timber	571,636	423,390	875,067	788,438	333,513	557,442
Sandwood	128,626	10,529	62,187	29,334	47,531	56,227
Dyeing and Tanning substances.	693,326	1,366,568	1,766,740	733,092	881,463	797,549
Myrobalan	379,626	328,986	675,413	271,873	391,106	493,367
Indigo	141,938	832,340	885,068	274,755	342,457	112,966
Turmeric	87,450	111,804	88,637	65,114	60,743	65,809
Catch and Gambier	62,162	77,189	92,425	58,204	37,473	50,816
Dry-divi (from Madras).	3,288	1,859	1,896	1,858	1,764	1,967
Hemp, raw	662,319	978,641	1,262,731	574,366	262,384	405,648
Oils—						
* Vegetable, non-essential.	355,653	1,868,132	1,479,011	684,816	368,822	348,269
Coconut	155,073	976,987	946,678	406,321	178,377	134,733
Castor	92,504	298,102	66,093	50,918	27,410	97,491
Rape and Mustard	48,624	51,532	75,870	75,045	55,954	80,084
Groundnut	30,013	54,740	185,439	29,609	10,590	8,487
Sesamum	28,699	19,567	36,763	22,107	18,247	15,908
Linseed	17,493	431,018	132,773	88,519	11,742	7,303
Mineral oil	142,732	230,602	2,429,952	1,280,738	1,370,586	1,496,785
Essential oil	113,992	232,309	392,932	353,439	213,953	232,423
Lemon grass oil	67,955	22,181	63,497	108,220	61,229	64,844
Animal oil	14,708	15,761	24,131	5,460	2,365	6,641
Fish oil	14,839	6,577	8,101	2,563	770	5,119
Carried over	154,849,484	148,805,288	194,330,108	146,247,926	142,751,198	187,853,320

\* For details of this trade see articles under respective seeds.  
† Information not available.

TABLE No. 28.—Exports of principal articles of Indian merchandise and their values for 1913-14, and from 1918-19 to 1922-23—concl'd.

Articles.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	£	£	£	£	£	£
Brought forward	154,349,484	148,808,288	194,330,108	146,247,826	142,761,188	187,868,320
Lanures	659,570	410,216	984,617	855,148	778,405	825,219
Peas	609,494	722,272	1,047,225	555,447	689,025	731,927
Pepper	289,943	408,889	436,087	136,695	206,900	232,719
Chillies	134,220	188,170	271,867	248,487	267,951	330,177
Ginger	152,661	65,707	143,858	100,543	130,740	118,657
Cardamom	49,994	51,605	176,388	58,318	51,610	37,488
Betelnut	8,224	8,119	16,249	9,010	10,009	11,140
Cinnamon	1,015	2,329	986	894	220	658
Cloves	231	1,888	659	479	182	391
Port (excluding cordage and rope).	604,190	237,699	692,905	686,224	617,388	736,304
Rubber, raw	524,486	1,669,527	1,125,104	1,034,255	514,405	488,340
Podder, Bran and Pollards.	516,069	63,868	785,837	761,195	788,994	841,706
Coal, Coke and Patent fuel	461,424	104,208	551,171	1,000,857	106,867	300,447
Paraffin wax	448,736	745,652	700,091	744,044	851,350	822,402
Fruits and Vegetables	412,762	399,279	418,246	492,344	421,551	420,738
† Coconuts	1,517	3,368	5,791	1,800	2,019	2,494
Provisions and Oilman-stores.	362,939	412,922	411,608	494,512	471,116	406,109
Ghi	232,945	235,666	247,138	385,711	306,800	248,688
Butter	38,988	45,584	40,281	30,599	44,804	37,037
Tobacco	319,568	642,206	617,489	499,485	476,888	551,187
Mica	302,564	598,971	574,443	674,254	422,271	405,170
Fish	261,584	293,979	336,767	378,489	402,347	361,688
Chemicals and Preparations.	219,049	762,915	413,447	517,572	301,785	265,010
Saltpetre	205,598	621,600	367,725	472,747	275,484	242,519
Borax	5,131	10,684	9,419	10,875	13,189	8,115
Silk—						
Raw silk	164,943	483,393	275,422	222,663	175,236	254,484
Silk manufactures	37,872	91,239	87,459	34,466	19,738	16,197
Bristles and Fibre	162,045	199,424	347,580	197,723	162,869	209,811
Candles	157,890	208,448	237,017	112,644	119,962	98,935
Drugs and Medicines	138,692	224,776	303,132	322,169	234,203	152,623
Senna	26,425	17,043	120,871	80,298	64,703	46,345
Nux vomica	17,366	57,606	65,692	118,221	88,464	37,259
Cinchona	8,289	708	5,503	12,786	6,967	553
Sugar	91,649	323,245	359,463	638,538	185,779	60,928
GRAND TOTAL (INCLUDING ALL OTHER ARTICLES).	162,800,999	159,538,554	208,135,949	160,008,175	154,258,892	199,441,222

\* For details of this trade see page 158.

† For details of this trade see Copra.

The general distribution, of exports, according to the countries participating in it, is illustrated in the table subjoined. In 1913-14, 37 per cent of the exports went to the United Kingdom and British Possessions and 63 per cent to foreign countries, the corresponding percentages for 1922-23 being 39 and 61. 56 per cent went to Europe and the greater part of the remainder was destined for Asiatic ports, while the continents of America, Australia and Africa received about 9, 1½ and 1 per cent, respectively. The import trade is to a much larger extent concerned with Europe while a feature of the distribution of exports has always been the number of countries participating in it.

At the close of the war, the percentage of exports to the United Kingdom had risen to over 29, but has now relapsed to 22.

TABLE NO. 29.—General distribution of the export trade shewing the shares borne by the principal countries of destination in the exports of merchandise from India in 1913-14, and from 1918-19 to 1922-23.

Name of countries.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
United Kingdom . . . . .	23.4	29.2	30.4	23.1	19.9	22.0
Germany . . . . .	19.6	..	.4	3.7	7.0	7.5
Japan . . . . .	9.2	12.1	14.8	10.1	16.5	13.4
United States of America . . . . .	8.9	13.8	15.6	14.5	10.6	11.5
France . . . . .	7.1	3.8	5.3	3.9	4.2	5.1
Belgium . . . . .	4.9	.004	3.0	5.3	3.5	3.8
Austria . . . . .	4.0*	.06*	.1*	.4*	.4	.4
Ceylon . . . . .	3.7	4.2	3.5	4.7	5.0	4.1
Italy . . . . .	3.2	4.0	2.7	2.8	2.5	3.4
Hongkong . . . . .	3.2	2.0	2.8	3.0	2.7	2.2
Straits Settlements . . . . .	2.8	2.9	2.3	3.6	3.2	2.5
China (excluding Hongkong) . . . . .	2.3	1.1	3.5	3.5	4.8	4.6
Holland . . . . .	1.8	.08	.5	.5	1.2	1.3
Australia . . . . .	1.6	2.6	1.1	2.6	1.7	1.8
Russia . . . . .	1.0	..	..	..	.002	.003
Egypt . . . . .	.9	6.1	1.0	1.4	.5	1.2
Java . . . . .	.8	1.4	.6	1.2	1.7	1.0
Perak . . . . .	.6	1.3	.8	.8	.9	.7
Mauritius . . . . .	.5	.6	.4	.7	.9	.8
Other countries . . . . .	9.5	14.1	11.2	15.2	12.2	12.7

\* Including exports to Hungary.

The United Kingdom has at no time claimed such a preponderating share of India's export trade as, owing to Lancashire piecegoods and iron and steel, she has done for many years in the import trade. Germany was at the outbreak of war the principal recipient of the raw hides shipped from Calcutta and of rice from Burma, France took the bulk of the South Indian groundnut crop and Japan much of the cotton.

While the war lasted enemy countries were of course *hors concours* and the tendency was naturally for the Allies to benefit elsewhere at the expense of neutrals. Increasing quantities of hides went to the United Kingdom and Italy and immense quantities of jute manufactures also to the former destination, and if Egypt figured largely in the statistics it was only as a most convenient entrepôt, while war lasted, for the Allied forces operating in Italy, Salonika and Palestine. In the five years since the Armistice trade has with few exceptions returned to the old channels. Germany, considering everything, has shewn a remarkable recovery but Russia and Austria have practically ceased to participate. Japan has more than maintained the position it acquired during the war and other countries participating to a larger extent than in 1913-14 are the United States of America and China.

It may be of interest here to attempt a summary of the principal features of Indian trade during the last ten years. In September

**Review of trade.** 1913 there was a severe banking and commercial crisis in northern and western India.

**1913-14.** The monsoon was irregular, there being floods in Bengal and a shortage of seasonal rainfall in the United Provinces which affected the sugar crop in particular. Simultaneously the piecegoods market became seriously overstocked, the demand from upcountry being affected by famine conditions and impaired credit. On the other hand, the trade in raw cotton was brisk, and there was an unusually large demand from the continent for oilseeds.

In the first four months of 1914 the monsoon promised to be a good one and a general improvement was confidently looked for. At this juncture the war broke out and it was difficult in the next few months for India to adopt with any conviction the Prime Minister's motto

**1914-15,** 'Business as usual.' At first the cessation of commercial relations with Central European

powers, who had been for some time and particularly in the twelve months preceding the outbreak of war increasingly good markets for India's raw material, caused great dislocation. Exporters of raw cotton from Bombay and of raw jute from Calcutta lost in Germany one of their best customers. The non-accessibility of invaded Belgium and the military preoccupations of Marseilles upset for a time the oilseed trade and the trade in groundnuts in particular, while the menace of the 'Emden' in the Bay of Bengal and of the 'Konigsberg' in the Arabian Sea paralysed exports generally. The jute mills of Bengal were working short time and were faced with a reduced demand for their manufactures. Further, there was a great shortage of freight due to vessels being commandeered for military transport and the inability of neutral shipping visiting Indian ports, to make good all at once the elimination of German and Austrian. It was not long, however, before the country began to adapt itself to war conditions. With the Allies entering upon an indeterminate period of trench warfare on the Western Front, an enormous demand arose for sand bags. Unlimited quantities of hides were required for the manufacture of boots for the new armies and more extensive orders from Japan for raw cotton coincided with an unusually abundant Indian crop.

As the war proceeded it became necessary to impose restrictions on the exports of food stuffs and articles, capable of being turned to warlike uses, to neutral destinations owing to the risk of their being diverted therefrom to the enemy, and to impose an embargo on certain classes of goods which might have been profitably exported owing to apprehended difficulties of replacement. The effects of Germany's ruthless submarining campaign also began to be felt particularly in the import trade. The monsoon in 1915-16 was not altogether favourable, but the export trade, in spite of the growing shortage of tonnage and an unparalleled increase in freights and insurance, did extremely well. Fresh records were established in the volume of tea, jute bags and cloth and raw wool exported, and large shipments of wheat were made on Government account.

In 1916-17 the value of India's overseas trade showed a noticeable advance, particularly in exports, which increased by 21 per cent, while imports increased by over 13 per cent. In the latter case, however, this inflation was due to higher prices and not to any increase in volume. The monsoon was particularly good and well distributed. Omitting sugar, which scarcely enters into the export trade, the crops were, with few exceptions, better than those of the previous year and the enhancement in the prices of raw cotton, saltpetre, shellac and indigo was greatly to the benefit of Indian exporters. Jute manufacturers found themselves in the happy position of commanding higher prices for their manufactures, while the raw material was 15 per cent below the level of prices at the outbreak of war and, though the intensification of the tonnage scarcity and the financial stringency, created by the curtailment of offerings of Council bills, were prejudicial to the full utilisation by exporters of the opportunities for profitable trading, the record of the year, all things considered, was very satisfactory.

The features of 1917-18 were heavier exports of commodities of vital national importance to meet the increasing demands of the Allies and the great impetus given by necessity to India's industrial development. The share of manufactured goods in the export trade, which was less than 24 per cent in 1913-14, increased to 31 per cent. Higher prices again inflated the figures given in the tables, noticeably under the head of imports. The textile industries, in particular, enjoyed extraordinary prosperity. There was a further fall in the price of raw jute and the decrease in the imports of cotton piecegoods encouraged considerable manufacture of better qualities of cotton cloth with higher counts of yarn in the mills of Western India.

The monsoon, which in 1916-17 and 1917-18 had been unusually favourable, was a partial failure in many parts of the country in 1918-19 and, in consequence, there was a great appreciation in the value of food grains, which had hitherto not responded to the world-wide advance in prices. The extent of the seasonal shortage is illustrated by the fact that the rice crop was less by 12½ million tons or 35 per cent and the wheat crop 2½ million tons or 24 per cent in defect. The first half of the year

was marked by great industrial activity, high prices and a good deal of unhealthy speculation particularly in the piecegoods market. The effects of the scarcity resulting from the partial failure of the monsoon had just become apparent when hostilities terminated in November. A considerable fall in freights followed, but the expectations of increased tonnage were scarcely realised. With so many adverse conditions operating in the last five months of the year, the volume of exports was 10 per cent lower than in 1917-18.

With the removal of war prohibitions and gradual relaxation of restrictions on commercial intercourse with enemy countries and on the export of such articles as raw jute, oils and oilseeds, and hides and skins, accompanied by an improvement in the freight position, business was brisk inspite of railway and cable congestion, high prices, labour difficulties, and unstable exchange. The crop failures of 1918-19 necessitated the continuance of Government control over the trade in such important food stuffs as wheat and rice, but the continued rise in the sterling value of the rupee encouraged imports without appreciably affecting exports, consisting mainly of raw materials, able to find buyers at almost any price. Further, the rainfall of 1919-20 was unusually favourable, and the year, therefore, closed with trade still booming, though signs were not wanting of an impending reaction. As compared with 1918-19, imports marked an increase in value of 29 per cent and exports of 30 per cent.

The slump which began, as was not altogether unexpected, early in the year first affected the export trade. The United Kingdom, America, and Japan, who are India's best customers, showed early in the year all the symptoms of congested stocks and slackening demands. Russia and Central Europe were known to be short, but unable to buy. In March 1920 the value of India's exports had reached the record figure of £21 millions. In March 1921 the total was only £12 millions. The year was a disastrous one for the tea trade. On the import side, the effects of the depression were much slower in their operation, and the steady inflow of goods turned the balance of trade against India to the extent of £53 millions.

Though the monsoon was satisfactory and freights enormously reduced, 1921-22 was a year of unrelieved depression, so far as overseas trade is concerned. It opened with heavy stocks on hand of most of the commodities which India imports, and throughout the year most of the markets, to which she exports, were lacking in purchasing power to such an extent that her exports were seriously curtailed. With warehouses congested with unsold stocks of imports there was very little demand for new supplies. Two factors, which seriously hampered business throughout the year, were the falling tendency of prices and the instability of exchange. The former was particularly noticeable on the import side and forced importers to purchase only for immediate requirements. On the export side the effects of the bad monsoon in 1920 were still noticeable, but the chief factors militating against any

1921-22.

trade revival were the economic exhaustion of Europe and the chaotic condition of foreign exchanges. There was, however, a welcome recovery both as regards quantity shipped and prices realized under the head of tea, and the year closed with an improved demand for cotton from Japan and for oilseeds from the Continent.

During 1922-23 stagnation continued to be the keynote in most branches of the import trade, but on the export side conditions in

1922-23.

India favoured a strong revival, to which, however, her overseas customers were only in a position to provide a moderate response. The rains were ample and well distributed and good harvests were reaped in practically all parts of the country. As a result of two good years the exportable surpluses of grains and seeds were considerable and prices of the staple food-grains fell appreciably. The unsold stocks of imported goods carried over from the previous year were gradually cleared, and the general increase in purchasing power was evidenced by the large importations of gold and silver, which were a normal feature of Indian trade before the war. The decrease, therefore, in the recorded values of imports was primarily due to lower prices while the increase in the values of exports was genuinely attributable to an increased volume of business effected. Political propaganda as well as falling rates contributed to a very remarkable contraction in the values of cotton piece-goods imported, but there were unprecedentedly large arrivals of wheat, sugar and machinery. As before the war more than 50 per cent of India's exports went to Europe, a return to normal conditions remains dependent upon the full recovery of her former markets there. Unfortunately, in the last three months of 1922-23 the economic condition of most Continental countries steadily worsened and their exchanges with it, and the uncertainty resulting was reflected in India in the increased prices of certain imports, particularly iron and steel and dyes, and in the slackening of the demand for certain of her exports, particularly hides.

### Principal exports

#### JUTE AND JUTE MANUFACTURES

Jute fibre, properly so called, is obtained from two varieties of *corchorus* (*corchorus capsularis* and *corchorus olitorius*), and India enjoys a practical monopoly as virtually its sole producer. For statistical purposes, however, the fibre obtained from *hibiscus cannabinus*, which is commercially known as *Bimlipatam jute* from the Madras port from which it is principally shipped, is also included under this head.

Jute growing is confined almost entirely to the Ganges-Brahmaputra delta in the Presidency of Bengal and the province of Assam

**Area and production.** with the adjoining Indian State of Cooch Bihar though there is some cultivation also of the plant in Bihar and Orissa. River inundation bringing down rich alluvial deposits enables the cultivator to plant this exhausting crop year after

year without expenditure on manure. The plants when once established require no attention and grow to the height of 10 to 12 feet. The crop is cut before ripening and retted for about three weeks in water before the fibre can be removed by washing and beating. Machine treatment for the extraction of the fibre has never got beyond the experimental stage. Jute is generally sown from March to May and harvested from July to September, and though it is customary in the trade to regard the season as ending on June 30th, practically the whole of the season's jute comes into sight commercially by the 31st March, when the official year closes. But the special conditions created by the war tended to extend this period. The demand for jute in the world's markets is based upon the fact that no cheaper fibre is procurable for bagging agricultural produce. Some idea of the importance of the trade may be gathered from the fact that in 1913-14 the total value, including India's internal consumption, of raw jute and jute manufactures, exceeded £40 millions and in 1919-20 over £50 millions.

TABLE No. 30.—*Estimates of the area under and production of jute in 1904, 1909, and from 1914 onwards.*

Year.	Acreeage under jute.	Production*in bales (400 lbs).
1904 . . . . .	2,899,700	7,400,000
1909 . . . . .	2,874,600	7,206,600
1914 . . . . .	3,352,200	10,443,900
1915 . . . . .	2,376,000	7,344,800
1916 . . . . .	2,702,800	8,309,300
1917 . . . . .	2,736,200	8,887,200
1918 . . . . .	2,600,400	6,955,700
1919 . . . . .	2,838,900	8,481,300
1920 . . . . .	2,609,000	5,915,000
1921 . . . . .	1,518,000	3,985,000
1922 . . . . .	1,800,000	5,408,000
1923 † . . . . .	2,313,000	6,923,000

\* These figures do not include imports from Nepal, which are in the neighbourhood of 60,000 bales annually, or the output in Madras of Binilpatam jute, etc.

† Figures are subject to revision.

The area under jute calculated from the yield of fibre did not exceed 850,000 acres in 1874. The average for the five years ending 1912-13 was estimated at 3,150,400 acres, and in the last pre-war year (1913-14), no less than 3,352,200 acres were appropriated to this crop. The decline which followed, and which was particularly accentuated

in 1921 and 1922 is attributable chiefly to economic causes. During the early part of the war, the cultivator saw the prices of jute manufactures soar much higher proportionately than those of the raw material. And the high prices obtainable for rice encouraged larger sowings of this important food-grain at the expense of jute in areas suitable for the cultivation of either. The provincial distribution of the crop and the estimated yield in 1923 are shown in the table below. Prices for all food grains had fallen, and it is no matter for surprise that the area under the crop was over 500,000 acres in excess of that for the previous year, the estimated increase of yield being equivalent to 28 per cent.

TABLE No. 31.—*Provincial areas under jute and the estimated yield in 1923.\**

Provinces.	Area (acres).	Yield (bales of 400 lbs. each).
Bengal . . . . .	1,986,000	6,146,000
Bihar and Orissa . . . . .	184,000	396,000
Assam . . . . .	114,000	322,000
Cooch Bihar State . . . . .	29,000	59,000
TOTAL . . . . .	2,313,000	6,923,000

\* Figures are subject to revision.

The increasing demand for the fibre may be illustrated by a comparison of the price of raw jute in 1851, when it was the equivalent of Rs. 14½ per bale of 400 lbs., whereas in 1906 the rate was Rs. 57-8. In 1907 there was a drop in value to Rs. 50-12 which was further accentuated in 1908 and 1909, when the price declined to Rs. 39 and Rs. 32-8 per bale respectively. In 1912 the average wholesale price was Rs. 54-4 and in 1913 Rs. 71 and by April 1914 the rate had gone up to Rs. 86-8 or more than three times the price of raw jute in 1880-84. The outbreak of war not only prevented quotations from soaring still higher but gave them a severe set-back. The high prices fetched in 1913 by the cultivators and favourable agricultural conditions led to the production in 1914 of a record crop, some two million bales in excess of the world's annual consumption of jute, as estimated in normal years. The marketing of this bumper harvest could even in ordinary circumstances scarcely have been effected without a substantial decline in prices. But two important consuming countries, Germany and Austria, being closed to the trade and exports to other destinations, including the United Kingdom, India's principal customer, being severely restricted, the market was completely glutted and prices sagged down to Rs. 31 in December 1914. A recovery to Rs. 41 by the following March was not sufficient to encourage cultivators, and in May there was again a decline to Rs. 37. When the final forecast disclosed that the area under raw jute had diminished by nearly one-third, rates hardened again and by March 1916 the quotation was Rs. 59. Prices in 1916-17 to 1919-20 ranged between Rs. 35 in August 1917 and Rs. 95 in August 1919. The record of variations from April 1920 to March 1923 will be found in the following table.

TABLE No. 32.—Wholesale price of first grade\* jute in Calcutta per bale of 400 lbs. from 1st April 1920.

Months.	1920-21.			1921-22.			1922-23.		
	Rs.	AS.	P.	Rs.	AS.	P.	Rs.	AS.	P.
April . . . . .	70	0	0	66	0	0	62	0	0
May . . . . .	72	0	0	70	0	0	74	0	0
June . . . . .	70	0	0	63	0	0	88	0	0
July . . . . .	65	0	0	61	0	0	88	0	0
August . . . . .	71	0	0	68	0	0	83	0	0
September . . . . .	74	0	0	70*	0	0	82	0	0
October . . . . .	86	0	0	69	0	0	83	0	0
November . . . . .	86	8	0	60	0	0	75	0	0
December . . . . .	71	0	0	55	0	0	88	0	0
January . . . . .	74	0	0	65	0	0	86	0	0
February . . . . .	71	0	0	60	0	0	76	0	0
March . . . . .	68	0	0	60	0	0	77	0	0

\*Known as ~~XX~~ up to September 1921.

The first shipment of raw jute was made apparently in 1795 but the recorded exports in 1828 were 364 cwts. only. In 1832-33, the figure rose to 11,800 cwts. and in 1838 the flax and hemp spinners of Dundee began

the manufacture of jute fabrics on power looms. The handloom industry in Bengal, however, possessed such vitality that up to 1850 the exports of manufactured jute goods exceeded those of the raw material. The demand for the latter was largely increased by the cutting off at the time of the Crimean war of the United Kingdom from supplies of Russian flax, and the exploitation of jute as a commercial fibre of the first importance dates from that epoch. In 1882-83 the shipments of raw jute amounted to 517,450 tons, and the figures thereafter rose steadily until 1908-09 when they totalled nearly 900,000 tons. The consumption in Dundee had for many years previous to the outbreak of war remained steady in the neighbourhood of 1,200,000 bales say 220,000 tons, annually. In 1913-14 when the exports aggregated 768,000 tons, or about half the total crop, shipments to the continent exceeded those to Dundee, although consignments to the United Kingdom were considerably above the normal.

TABLE No. 33.—Distribution and total value of the export trade† according to countries in 1913-14 and from 1918-19 onwards.

Countries.	1913-14 bales.	1918-19 bales.	1919-20 bales.	1920-21 bales.	1921-22 bales.	1922-23 bales.	
United Kingdom	1,626,067	1,255,075	1,789,752	761,729	508,676	874,597	
Germany . . . . .	886,928		20,210	403,581	806,473	792,232	
United States . . . . .	659,366	342,882	434,834	616,028	371,963	501,710	
France . . . . .	407,165	240,593	452,094	280,246	312,687	320,807	
Austria . . . . .	256,072‡		1,002‡	8,210‡			
Italy . . . . .	211,512	149,144	157,226	128,066	141,820	195,283	
Spain . . . . .	118,613	73,113	107,173	133,599	123,872	156,542	
Other countries	137,603	168,907	401,867	314,059	353,545	395,377	
TOTAL	Bales	4,303,326	2,229,714	3,314,158	2,645,518	2,619,036	
	Tons	768,451	398,146	591,814	472,414	467,685	3,236,548
TOTAL	Value†	20,550,929	8,480,052	16,666,301	10,907,243	9,366,106	15,018,976

‡ Including Bimlipatam jute.

† Including exports to Hungary.

In 1913-14 Germany, where the fibre is used in the manufacture of blankets, cheap carpets, etc., was, next to the United Kingdom, India's best customer for raw jute. Her normal requirements were in the neighbourhood of 800,000 bales annually and 250,000 went to Austria-Hungary, and the trade did not at first make good the gap caused by the disappearance of these important markets during the war. In 1914-15 exports to all destinations, except to Italy and Spain, shewed a considerable decline. The 1915 crop was a small one, but in 1915-16, when it came commercially into sight, the volume of exports increased from 2,828,000 to 3,360,000 bales, the United Kingdom, the United States, Italy and Spain all receiving increased quantities. The estimated yield of the crop in 1916 was considerably higher but owing chiefly to the conditions created by the war the volume of exports was 10 per cent less in 1916-17 than in the previous year. From February 1917 onwards exports were prohibited to all destinations, including the United Kingdom, except under a license granted by the Chief Customs officer at the port of export and the total exports in 1917-18 amounted only to 278,000 tons, the lowest for forty years. Of this 94,200 tons went to the United States and only 67,800 tons to the United Kingdom, about a fifth of her pre-war quinquennial average. The control over exports was partially removed in March 1919 and with effect from the 18th October disappeared altogether.

From 1919-20 the volume of exports has been maintained fairly steadily in the neighbourhood of half a million tons annually while prices after two years of marked decline have in 1922-23 nearly recovered the level of 1919-20. The remarkable manner in which Germany has recovered its position in this market will not be overlooked. Sterling credits have enabled her in the last two years practically to satisfy her pre-war requirements of 800,000 bales annually, while shipments to the United Kingdom were more than 50 per cent. in defect in 1921-22, and 25 per cent in the following year.

Between the cultivator of jute and the shipper many middlemen intervene. The cultivator disposes of his jute to a *bepari* or petty dealer who has received advances from a *mahajan* or broker (also known as *arathdar*) on the understanding that he gets as much jute as he can for the latter. The intervention of the *bepari* if not that of the *mahajan*, between the cultivator and the wholesale buyer, is unavoidable because the individual holdings are generally very small. The *mahajan* sells to the big buyer who may be the representative of a large exporting firm or of a mill, a baler or another broker, by whom the preliminary sorting, grading and bulking are effected. The most important trade centre upcountry for raw jute is at Narayananj. Raw jute is transported by river, rail or road to Chittagong and Calcutta. The imports into Calcutta of raw jute in the year ending June 1922 by rail, river, and road amounted to nearly 1,324,000 tons. The bulk of the jute for Calcutta is despatched in *kutcha* bales. Jute, unlike cotton, loses only an

insignificant percentage of its weight in the processes of cleaning and baling.

The raw jute market in Calcutta is operated by brokers who sell either to the mills or to balers who may or may not be exporters also. In 1923 the number of jute presses in Calcutta and the neighbourhood amounted to 46, as compared with 32 only in 1918. All jute is baled for export, the unit of sale as well as of shipment being the bale of 400 lbs. though sterling quotations are usually on the basis of a ton, *c.i.f.* Brilliant colour, glossiness and length are the characteristics of good jute. Some mills prefer hard and some soft fibre. Though a number of grades are recognised, such as *uttariya*, *deswal*, *daisee* (the standard quality), *deora*, etc., traders' marks play a very important part in the business, while *Narayanganji* and *Serajanganji* are fibres named after the localities whence they are obtained. The lowest qualities are sold as *rejections* while *cuttings* represent the hard and woody ends of the plants.

The first power mill in India to spin jute started work at Rishra near Serampur in 1855 and the first weaving mill at Baranagore four years later and the industry progressed steadily until 1875 when there was a temporary set-back owing to a too rapid increase in the number of looms. Since then the record is one of almost uninterrupted progress. Hand weaving has in consequence altogether died out, but the hand spinning of jute twine is still carried on as a cottage industry throughout the jute growing districts. The product of the mills is now about 4,000 tons a day and the consumption of raw jute in Indian mills is five times that of Dundee and five-sixths of the total production of jute in India, the actual figures for consumption in 1921-22 being about 4,500,000 bales out of an estimated total crop of 5,408,000 bales. The number of jute mills in India has increased since 1870 from 5 to 86, and the number of looms from 1,250 to 48,500. Practically all the mills are in the neighbourhood of Calcutta on the banks of the Hooghly for convenience of cheap water transport, the only mills outside Bengal being three in the Madras Presidency utilising *hibiscus cannabinus* only. While the chief products of the mills in pre-war times had been gunnies and hessian cloth, military demands during the war gave an impetus to the conversion of the latter into sandbags and to a largely increased output of tarpaulins. But perhaps the most interesting war development was the manufacture of jute canvas, when the Russian revolution closed the principal European flax market to the allies. Over 5,000,000 yards were made by the Calcutta mills in 1918.

The record of the jute industry, which is mainly in Bengal, has been, as has been stated, one of almost uninterrupted progress. In the following table, the quinquennial averages from 1879-80 to 1913-14 for mills, capital, persons employed, looms and spindles are supplemented by actuals for the last nine years, while the figures in brackets represent the variations for each period taking the average for the first quinquennium as 100.

TABLE No. 34.—Table to illustrate the expansion of the jute industry from 1879-80.

Year.	No. of mills at work.	Nominal capital in lakhs of Rs.	NUMBER (IN THOUSANDS) OF		
			Persons employed.	Looms.	Spindles.
1879-80 to 1883-84	21 (100)	270.7 (100)	38.8 (100)	5.5 (100)	88.0 (100)
1884-85 to 1888-89	24 (114)	341.6 (120)	52.7 (136)	7.0 (127)	138.4 (157)
1889-90 to 1893-94	26 (124)	402.6 (149)	64.8 (166)	8.8 (151)	172.6 (196)
1894-95 to 1898-99	31 (148)	522.1 (198)	86.7 (223)	11.7 (218)	244.8 (278)
1899-1900 to 1903-04	36 (171)	680.0 (251)	114.2 (294)	16.2 (295)	334.6 (380)
1904-05 to 1908-09	46 (219)	960.0 (355)	165.0 (425)	24.8 (451)	510.5 (580)
1909-10 to 1913-14	60 (286)	1,200.0 (448)	208.4 (537)	33.5 (609)	601.8 (786)
1914-15	70 (333)	1,394.3 (515)	238.3 (614)	38.4 (698)	795.5 (904)
1915-16	70 (333)	1,322.5 (488)	254.1 (655)	39.9 (725)	812.4 (923)
1916-17	74 (352)	1,395.5 (516)	262.5 (676)	39.6 (720)	824.3 (937)
1917-18	76 (362)	1,428.5 (528)	266.0 (686)	40.6 (738)	834.0 (948)
1918-19	76 (362)	1,477.2 (546)	275.5 (710)	40.0 (727)	839.9 (954)
1919-20	76 (362)	1,568.5 (577)	280.4 (723)	41.0 (745)	856.3 (973)
1920-21	77 (367)	1,923.5 (711)	288.4 (748)	41.6 (756)	869.9 (989)
1921-22	81 (386)	2,647.0 (978)	288.4 (748)	43.0 (782)	908.4 (1032)
1922-23	86 (410)	3,192.8 (1179)	321.2 (828)	48.6 (825)	1,002.8 (1140)

At the beginning of 1914 raw jute commanded abnormal prices—the price of ~~raw~~ group bales being Rs. 82 in Calcutta and of first marks in London £36 per ton. When war broke out these rates had declined to Rs. 50—55 and £27.10, and when the forecast issued in September indicated an unusually large crop, prices sagged badly, of which the mills, with anticipation of a considerably enhanced demand for military requirements, took advantage to secure large stocks of the raw material at extremely favourable rates. During 1914-15 the exports of jute manufactures from India amounted in value to nearly £17½ millions. There were increased shipments to the United Kingdom. Russia (*via* Vladivostok) bought heavily and also Japan, but Australia's demands were reduced owing to the partial failure of the wheat harvest.

The prosperity of the industry was enhanced in the following year owing to increased war demands from France and Russia as well as from the British Government. Labour was plentiful and while the price of gunnies rose steadily the mills were in the fortunate position of being able still to command unlimited quantities of cheap jute. As regards the direction of the trade, 46 per cent of the gunny bags exported went to the Allies and of the gunny cloth 52 per cent to the United States of America and 16 per cent to the United Kingdom.

In 1916-17, the foreign exports of jute manufactures amounted to 788,600 tons and the value of the trade rose to the unprecedented total of nearly £28 millions. 43 per cent of the gunnies went to the United

Kingdom, while the United States of America took 56 per cent of the cloth exported and the Argentine Republic 11 per cent.

One of the main features of the export trade in 1917-18 was the rise in the price of the manufactured article, though the price of the raw material was even lower than in the previous year, and with smaller shipments the value of the trade touched £29 millions, a figure which is more than double the average value of the exports in the quinquennium preceding the war. Larger quantities of bags went to the United States, the Argentine, Japan, Egypt and South Africa but less to the United Kingdom and two-thirds of the total quantity of cloth was exported to the first named destination.

The year 1918-19 was one of unparalleled prosperity for the Indian jute mills in spite of a rise in the price of the raw material towards its close, owing to a short crop of indifferent quality and an unsettled business outlook, and with enhanced prices everywhere prevailing, the total value exceeded £35 millions. Of private shipments, Australia was the best customer for bags and the United States for cloth.

In 1919-20, the volume of business was about the same, and in 1920-21, there were increased shipments particularly of bags but prices fell considerably. Short time working was resumed in the mills in January 1921. In 1921-22, shipments of jute manufactures as well as of raw jute were much reduced, and prices further dropped towards pre-war levels. Shipments to South America were markedly in defect. In 1922-23, Australia and Cuba were the best markets for bags but an improved South American aggregate was still far below pre-war levels. The United States of America took three quarters of the cloth exported and Canada, Australia and China increased their takings.

In pre-war times the quantity of raw jute exported was nearly equal to the consumption in Indian mills. Now the latter is, as the table below shows, nearly twice as great as the former.

TABLE No. 35.—*Mill consumption and exports of raw jute from 1913-14*

Period.	Mill consumption. (1,000 bales.)	Export (1,000 bales.)
Season ending June 30th, 1914 . . . . .	4,499	4,310
.. .. 1915 . . . . .	4,944	3,046
.. .. 1916 . . . . .	5,770	3,167
.. .. 1917 . . . . .	5,678	2,840
.. .. 1918 . . . . .	5,447	1,756
.. .. 1919 . . . . .	5,139	2,210
.. .. 1920 . . . . .	5,227	3,400
.. .. 1921 . . . . .	5,623	2,336
.. .. 1922 . . . . .	4,358	2,979
.. .. 1923 . . . . .	4,747	2,949

When fulltime working is resumed, mill consumption is likely to reach 6 million bales.

The diminishing proportion of jute exported from India unmanufactured is illustrated by the following table.

TABLE No. 36.—*Values, percentages and totals of raw and manufactured jute exported in 1913-14 and 1922-23 contrasted.*

Articles.	1913-14.		1922-23.	
	Value.	Percentage.	Value.	Percentage.
	£		£	
Jute—				
Raw . . . . .	20,551,000	52.7	15,019,000	35.7
Manufactures . . . . .	18,849,000	47.3	26,996,000	64.3
TOTAL . . . . .	39,400,000	100	42,015,000	100

In 1918-19 when restrictions on the export of raw jute were still in force the percentage of jute manufactures to the total was over 80 per cent. Details under main heads of the manufactures exported are given below.

TABLE No. 37.—*Details of jute manufactures exported in 1913-14 and in 1922-23.*

Manufactured articles.	1913-14.		1922-23.	
No. of bags . . . . .	368,759,000		344,232,000	
Weight . . . . . Tons		325,700		327,600
Yards of cloth . . . . .	1,061,152,000		1,254,352,000	
Weight . . . . . Tons		275,200		339,200
Miscellaneous goods weight . . . . .		4,200		4,900
TOTAL WEIGHT . . . . .		605,100		671,700
Value of bags . . . . . £	8,353,000		10,638,000	
„ cloth . . . . . £	10,396,000		16,212,000	
„ miscellaneous goods . . . . . £	100,000		146,000	
TOTAL £	18,849,000		26,996,000	

Towards the end of 1916 the Director-General of Commercial Intelligence was appointed Jute Commissioner in Calcutta to effect the purchases of raw jute for the Dundee mills by the various firms among whom the orders were distributed on the basis of their previous Dundee business.

**Government buying operations.**

This arrangement, which effected considerable economies, was terminated in 1917 when a new scheme was introduced involving purchase in London from selected firms. An officer, designated Jute Controller, was subsequently entrusted with the placing out of contracts in India for the purchase of jute manufactures for army requirements at controlled rates which are calculated to have effected a saving to the Indian and Australian Governments of £1½ millions in 1918 alone. The record of Government orders placed on behalf of the British Indian, Australian and Allied Governments since 1915-16 is shown in the table below. Early in 1918 there was also effected a quick shipment of 4 million wheat bags to America on account of the U.S.A. Food Administration. In addition one million bags were shipped early in 1919-20 just after control was removed. The appointment of Controller was then abolished.

Of 221 million bags shipped in 1918-19, 132 million went to the United Kingdom; 74½ million to Egypt 'for orders'; 7½ million to Italy; and 7 million to the Argentine for bagging wheat purchased by the Royal Commission on Wheat supplies. Of the cloth, 113½ million yards went to the United Kingdom, 80½ million yards to the Argentine and 66 million yards to France.

TABLE No. 38.—*Shipments on Government account of Jute manufactures from 1915-16 to 1918-19.*

Year.	Bags.	Cloth in yards.
1915-16 . . . . .	297,000,000	35,000,000
1916-17 . . . . .	385,000,000	135,000,000
1917-18 . . . . .	391,000,000	205,000,000
1918-19 . . . . .	221,000,000	269,000,000
TOTAL . . . . .	1,294,000,000	644,000,000

The trade names of the principal jute manufactures with their sizes, weight and texture are given below. The terms 'porter' and 'shot' correspond to warp and weft. 'Hessian' is the term applied to the finest quality of jute yarn. The name is said to owe its origin to a fine quality cloth which Dundee used to supply to Hesse. 'Hessians' are made of hessian warp and weft. 'Sacking yarn' is inferior and generally darker in colour and deficient in gloss. 'Fine twill sacking' cloth is often made of hessian warp and sacking weft.

TABLE No. 39.—Size, weight and texture of the principal jute manufactures exported.

Description.	Breadth and length.	Weight.	Porter & shot.
Twill Corn-sacks . . . . . Bags	41" × 23"	2½ lbs.	8" × 9"
A. Twills . . . . . "	44" × 26½"	2½ "	8" × 9"
Liverpool Twills . . . . . "	44" × 26½"	2½ "	8" × 8"
No. 2 Twills . . . . . "	44" × 26½"	2½ "	6" × 8"
B. Twills . . . . . "	44" × 26½"	2½ "	8" × 8"
Grain sacks . . . . . "	60" × 30"	5 "	6" × 8"
Cuban Sugar Twills . . . . . "	48" × 29"	2½ "	8" × 8" or 7" × 9"
Sugar Twills . . . . . "	48" × 28"	2½ "	6" × 8"
Heavy C's . . . . . "	40" × 28"	2½ "	8" × 9"
Light C's . . . . . "	40" × 28"	2 "	8" × 8" or 7" × 9"
K. Bags . . . . . "	40" × 28"	1½ "	6" × 8"
Flour Bags . . . . . "	56" × 28"	2½ "	8" × 8" or 7" × 9"
Salt Bags . . . . . "	46" × 28"	1½ "	6" × 8"
E. Bags . . . . . "	40" × 28"	1½ "	6" × 8"
Hessian Cloth . . . . . "	40"	*8 oz.	9" × 10"
" " " " " "	40"	*10½ "	11" × 12"
Fine twill sacking cloth . . . . . "	"	*14 "	10" × 12"
Twilled sacking . . . . . "	22"	*14 "	8" × 8"
Twill sacking cloth . . . . . "	27"	*16 "	8" × 8" or 8" × 9"
Twilled sacking . . . . . "	28"	*16 "	6" × 8"
Twill sacking cloth . . . . . "	29"	*24 "	8" × 9"

\*Per yard.

With effect from the 1st March 1916 the Government of India decided to levy an export duty on raw jute other than cuttings at a general rate of Rs. 2-4-0 per bale of 400 lbs. equivalent approximately to an *ad valorem* duty of 5 per cent. The duty on cuttings was fixed at 10 annas per bale.

**Export duty.**

Simultaneously an export duty of Rs. 16 per ton was imposed on hessians and Rs. 10 per ton on sacking, corresponding to the raw jute rate on the material used in the manufacture of each class of goods. With effect from the 1st March 1917 these rates were doubled, and now stand at Rs. 4-8-0 and Re. 1-4-0 for raw jute and cuttings and Rs. 32 and Rs. 20 for hessians and sacking, respectively. These duties are not applicable to Bimlipatam jute. The amount realized by this duty in 1922-23 was £2,195,000.

The question of legislating to prevent adulteration, particularly by watering, of raw jute tendered for export has been frequently discussed and in 1916 the Bengal Government went so far as to draft a bill to deal with the evil but in the face of the opinion, generally held in commercial circles, that it would prove unworkable, the measure was never proceeded with.

Though there is no true jute (*corchorus*) grown outside the old Presidency of Bengal and Assam, there is a considerable area in the

**Bimlipatam jute—  
(1) Raw**

Bombay and Madras Presidencies and sporadic cultivation in the Central Provinces of *hibiscus cannabinus* which yields a fibre which is very similar and can be put to practically the same uses. This fibre, which is known as Deccan hemp in Western India, figures more promi-

nently in the export trade under the name of Bimlipatam jute from the port on the Bay of Bengal from which it is chiefly shipped. The area under *hibiscus cannabinus* in the Bombay Presidency is about 90,000 acres and in Madras between 70,000 and 80,000 acres. In Bombay it is chiefly found in the Deccan and Karnatak and in Madras, in the Vizagapatam and Nallore districts. Experimental cultivation has also begun in Bihar. The normal outturn in Madras may be taken at about 700 to 800 lbs. of dry fibre per acre, the percentage of fibre to dry stalks being about 16. The chief ports of export are Bimlipatam, and Vizagapatam. The following table illustrates the vagaries of the export trade, which was greatly affected in the first three years of the war by an uncertain and diminishing steamer service. In 1917 control practically stopped all shipments, and the partial recovery made in 1919-20 was not maintained in the two following years owing chiefly to poor harvests, which greatly reduced the exportable surplus after meeting the mill demands. As in the case of *corchones* increased mill consumption is likely hereafter to reduce still further the proportion of this fibre shipped in the raw state. Increased mill consumption accounts for the falling off in the last quinquennium in shipments of the raw material.

TABLE No. 40.—Exports of Bimlipatam jute (raw) from Madras ports.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	22,003	517,992
1914-15 . . . . .	6,822	94,859
1915-16 . . . . .	5,867	84,002
1916-17 . . . . .	6,090	112,268
1917-18 . . . . .	32	551
1918-19 . . . . .	2,376	60,750
1919-20 . . . . .	5,911	156,418
1920-21 . . . . .	749	17,463
1921-22 . . . . .	912	17,423
1922-23 . . . . .	2,320	61,519

The principal pre-war destinations were the United Kingdom (67 per cent) and France (8 per cent), but in 1913-14 Germany took 5,000 tons equivalent to very nearly 25 per cent of the whole. In 1922-23 the chief customers for *hibiscus cannabinus* were Germany 58 per cent, the United Kingdom 26 per cent, and France 15 per cent. The shipments of the same fibre from Bombay are not separately distinguished. The season for shipments in Madras usually runs from January to April and the unit of shipment is the steam-pressed bale of about 400 lbs. rope lashed.

Though there are three factories in the Madras Presidency, which deal with this fibre, the principal being at Chittivalsa near Bimlipatam, and Nellimarla near Vizianagram, the exports of manufactures are inconsiderable. There is a good local demand for the bags which compete with gunnies of similar texture from Calcutta mills. There are no mills manufacturing Deccan hemp in Bombay.

### RAW COTTON.

According to the average of the last five years the exports of raw cotton represent no less than 41 per cent of the total value of raw materials exported from India. The extent of the trade depends primarily of course upon the exportable surplus which in turn depends upon the general harvest in India, but the relation of textile activity in Europe and the United States to the supplies available in America and Egypt has such an important bearing upon the prices as to be a factor of scarcely less importance.

The view was at one time held that the production of cotton was scarcely keeping pace with the increasing demand for cotton cloth, and it would be necessary for Lancashire in particular, if she is to maintain her place as a manufacturer of cotton goods, to tap fresh sources of supply. In this connection no country in the world offers such potentialities for making the additional contributions to the world's cotton crop, necessary to restore equilibrium, as India, but the problem is complicated by the doubt as to what extent Indian short staple will really relieve the situation, even if, without any increase in the area cultivated, reliance upon more prolific types of plant, better agricultural practice and a more liberal use of fertilisers were to guarantee the proportionate increase in outturn which the situation demands. This problem was one of those referred to and considered by the Indian Cotton Committee, whose report was published in 1919 and their survey of the position of the Indian cotton crop is summarised in the following paragraphs.

The area under cotton in India covers such a wide climatic range that the season for planting and picking are divergent in different parts of the country and while in the Punjab and Sind the crop is almost entirely irrigated, elsewhere it depends for the most part upon the sufficiency and timeliness of the monsoon rainfall.

The area and yield in 1913-14 and 1914-15 were 25,023,000 acres and 5,065,000 bales and 24,595,000 acres and 5,209,000 bales, respectively. The average yield per acre in India is between 75 and 100 lbs. of lint cotton only, as compared with 200 lbs. in the United States of America and 360 to 400 lbs. in Egypt.

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In the last pre-war year the value of the Indian cotton crop was estimated at £49½ millions or 15 per cent of the world's total crop. In 1918-19 with the price of good Broach above 13d., the value of the reduced crop gathered was estimated at £76 millions. In 1922-23 with the price of good Broach above 10d., the value of the crop is estimated at £88 millions.

TABLE NO. 41.—Acreage and yield in bales of 400 lbs. each of cotton in each province from 1918-19 onwards.

	1918-19.		1919-20.		1920-21.		1921-22.		1922-23.*	
	Area.	Yield.								
Bombay (including Sind and Indian States)	6,678,000	886,000	6,970,000	1,716,000	6,766,000	1,094,000	5,276,000	1,222,000	5,847,000	1,351,000
Central Provinces and Berar	4,135,000	807,000	4,600,000	1,289,000	4,477,000	614,000	4,414,000	1,127,000	4,708,000	1,200,000
Hyderabad State	2,406,000	648,000	2,006,000	749,000	2,214,000	341,000	2,214,000	870,000	2,818,000	1,116,000
Madras (with Indian States)	3,173,000	589,000	2,370,000	411,000	2,160,000	268,000	1,803,000	341,000	2,323,000	423,000
Central India States	1,236,000	214,000	1,591,000	219,000	1,332,000	192,000	1,069,000	204,000	1,413,000	290,000
Punjab (with Indian States)	1,550,000	492,000	2,269,000	682,000	2,142,000	688,000	1,239,000	296,000	1,417,000	409,000
United Provinces (with Rampur)	862,000	174,000	1,268,000	436,000	1,161,000	327,000	828,000	244,000	659,000	178,000
Rajputana States and Ajmer-Merwara	230,000	59,000	416,000	123,000	417,000	96,000	323,000	80,000	338,000	91,000
Burma	369,000	70,000	430,000	89,000	386,000	42,000	325,000	40,000	272,000	46,000
Bengal (including Tripura state) Bihar and Orissa† and Assam.	184,000	64,000	179,000	56,000	188,000	60,000	184,000	43,000	192,000	46,000
Mysore	126,000	14,000	145,000	18,000	111,000	11,000	69,000	15,000	88,000	24,000
North-West Frontier, Province (with Tochi and Kurram Agency).	89,000	7,000	61,000	11,000	27,000	6,000	15,000	3,000	15,000	8,000
Delhi	(a)	(a)	(a)	(a)	(a)	(a)	2,000	(b)	2,000	1,000
TOTAL	21,037,000	3,977,000	23,363,000	5,799,000	21,340,000	3,699,000	18,461,000	4,465,000	21,077,000	5,131,000

\* Subject to revision.  
† Excluding Feudatory States.  
(a) Not available (b) 800 bales.

The average area under cotton in the Bombay Presidency, including Sind and Indian States, cropped during the five years ending 1922-23 was 6,305,000 acres, of which the share of Bombay was 3,285,000 acres, of Baroda 717,000 acres and of Sind 247,000 acres.

No separate figures are available for the production of Lancashire long staple cotton or of Bombay standard \* long staple in the Presidency, though considerable areas are devoted to both.

Cotton growing tracts in the Presidency fall into five divisions—

- (i) the area comprising the greater part of North Gujarat, the adjoining tracts of the Baroda State and the greater portion of Kathiawar where the trade variety *Dholeras* is produced ;
- (ii) Southern Gujarat, including the Broach and Surat districts in British territory and the Navsari District in Baroda where *Broach* cotton, the barometer of the Indian cotton trade, is grown ;
- (iii) the Bombay Deccan including the districts of East and West Khandesh, Nasik, Ahmednagar and Sholapur, also the northern part of the Bijapur District of the Hyderabad State where *Khandesh* cotton is cultivated ;
- (iv) the Karnatak, comprising the districts of Dharwar, Belgaum and the greater part of Bijapur as well as the Indian States of Kolhapur and Sangli whence *Kumpta-Dharwar* is obtained ; and
- (v) the territory to the left of the Indus in Sind in the Nawabshah, Thar and Parkar and Hyderabad districts where *Sind* cotton is raised. In parts of the Bijapur district *westerns* are also grown as in the Madras Deccan.

Trade classification.	Staple in inches.	Ginning percentage.	Estimated acreage in a normal season.	Average outturn (in bales of 400 lbs. each).
Khandesh—				
Khandesh <i>roseum</i> , etc.	3/8" to 4/8"	38	2,005,000	396,000
Dholeras—				
Wagad, etc.	6/8" to 7/8"	33	2,100,000	585,000

\* In Bombay any cotton actually measuring  $\frac{1}{4}$ " or over is long staple, but the Lancashire standard is a commercial inch or more correctly, cotton exceeding  $\frac{1}{4}$ ".

Trade classification.	Staple in inches.	Ginning percentage.	Estimated acreage in a normal season.	Average outturn (in bales of 400 lbs. each).
Brosch—				
Navsari . . . . .	7/8" to 1"	31	} 1,210,000	280,000
Surat, etc. . . . .	7/8"	32		
Kumpta-Dharwar—				
Kumpta-Dharwar . . . . .	7/8"	26	1,200,000	240,000
American Dharwar . . . . .	6/8" to 7/8"	30	2,000,000	55,000
Westerns . . . . .	6/8"	25	500,000	65,000
				(including Hyderabad)
Sind . . . . .	3/8" to 5/8"	35	245,000	67,000

Raw cotton accounted for 64 per cent of the total exports of Indian merchandise from the Bombay Presidency in 1922-23, the total quantity shipped being about 2,735,000 bales of 400 lbs. each.

During the five years ending 1922-23 the average area cropped was 4,466,000 acres equivalent to 21 per cent of the total for India. In 1922-23 the total acreage was 4,703,000.

Of the total crop, about 2,000 bales of *bani* cotton when marketed pure and about 500 bales of *buri* are equal to Lancashire staple. The rest are all short staple cotton. Commercially they are all classified as *Omras*. The most important tracts are the four districts of Berar and the adjacent districts of Nimar, Wardha and Nagpur, the main varieties produced being (i) the *Berar and Central Provinces* type in Berar and western part of Central Provinces, (ii) *roseum* in Berar and the adjoining tracts, (iii) *bani* in the Hinganghat district and as a cold weather crop in the Chanda district. The acreage under *buri* does not exceed 2,000.

Trade classification.	Staple in inches.	Ginning percentage.	Estimated acreage in a normal season.	Average outturn (in bales of 400 lbs. each).
Omras—				
Berar and Central Provinces.	5/8" to 6/8"	35	3,700,000	571,000
Roseum . . . . .	4/8" to 5/8"	40	700,000	180,000
Bani . . . . .	1" to 1 1/4"	25	10,000	2,000

The area under cotton for the five years ending 1922-23 averaged 2,888,000 acres. In 1922-23, the acreage was 3,813,000.

Of the total crop realised, nearly 160,000 bales, if marketed pure, are up to Lancashire standard.

Two main varieties of cotton are cultivated—*buri* and *bani*, which both come under the trade description of *Omras*. *Buri* is said to pre-

dominate in the Adilabad, Nizamabad and Karimnagar districts, while *bani*, alternatively known as *Hyderabad gaorani*, is the most important variety in the west, particularly in Parbhani and Nander. In Raichur and south of Gulbarga the *westerns* cotton of Madras are found, while south-east of Warangal, *Cocanadas* are grown and as a mixed crop *Khandesh* also.

Trade classification.	Staple in inches.	Ginning percentage.	Estimated acreage in a normal season.	Average outturn (in bales of 400 lbs. each).
Bani (Hingahat Barai or Gaorani).	1" to 1½"	29	830,000	168,000
Buri . . . . .	7/8" to 1"	31	115,000 acres are returned, but this is probably Berar cotton with a large mixture of upland American and is included in No. 3 below.	
Khandesh . . . . .	4/8" to 5/8"	32	{ 530,000 mixed with <i>bani</i> 115,000 mixed with <i>buri</i>	
Westerns . . . . .	6/8"	25		65,000 (including Bombay).
Cocanadas . . . . .	5/8" to 7/8"	23	No separate figures available.	

For the quinquennium ending 1922-23, 2,364,000 acres on an average were under cotton in the Madras Presidency including Indian States. Madras. The area in 1922-23 was estimated at 2,400,000

444,000 bales, an acre with a yield of advance of 26 per cent on the figures for 1921-22. About half of the total crop comes within the Lancashire definition of long staple.

The cotton growing tracts in Madras fall into three well-marked divisions:—

- (i) the Deccan tableland including the districts of Bellary, Anantapur, Kurnool and Cuddapah in which *northerns* and *westerns* are grown, the former chiefly in the two first named and the latter chiefly in the two last named districts;
- (ii) the Coromandel coast including the uplands of Guntur, Kistna, Nellore and Godavari (of which the first named is much the most important) where *Cocanadas* are grown; and
- (iii) the southern districts of Tinnevely, Ramnad, Madura, Trichinopoly and Coimbatore where (1) *Cambodia* (a variety of American upland, the seed of which was obtained direct from Cambodia about 1905) is grown on red soils, preferably well irrigated, and (2) *Tinnevellies* of which pure *karungani*, a variety selected by the Agricultural Department, is much the most important variety, grown on the black soils.

*Uppam* cotton grown in the Coimbatore and Trichinopoly districts (and to a small extent in Salem) passes under the trade name of *Salems*.

Trade classification.	Staple in inches.	Ginning percentage.	Estimated acreage in a normal season.	Average outturn (in bales of 400 lbs.)
Northerns . . . . .	7/8"	27	439,000	65,000
Westerns . . . . .	6/8"	25	650,000	85,000
Cocanadas . . . . .	5/8" to 7/8"	23	261,000	40,000
<i>Tinnevellies</i> —				
Karunganni . . . . .	7/8"	32	220,000	50,000
<i>Tinnevellies</i> . . . . .	6/8" to 7/8"	27	320,000	84,000
<i>Cambodia</i> —				
Irrigated . . . . .	6/8" to 1 1/8"	30 to 33	100,000	60,000
Unirrigated . . . . .	5/8" to 7/8"	30 to 33	200,000	65,000
<i>Salems</i> —				
Uppam . . . . .	6/8"	25	154,000	27,000

Owing to a reduction in the area under the crop in the previous year raw cotton accounted for only 9 per cent of the total exports of merchandise from the Madras Presidency in 1922-23. 54 per cent of the cotton shipped was *Tinnevellies* and the balance chiefly *Northerns* and *Westerns*.

For the five years ending 1922-23, the average area under cotton in the Punjab was 1,723,000 acres inclusive of 145,000 acres returned by Indian States. The figures for 1922-23 were

**The Punjab.**

1,417,000 acres only. Seventy-five per cent of the crop is ordinarily under irrigation and nearly a fourth of the cotton grown is of Lancashire staple.

Three tracts may be distinguished : (i) the territory lying north-west of a line drawn from Ambala to Hissar where *Sind-Punjab* cotton is cultivated ; (ii) the Punjab Canal colonies in the districts of Lyallpur, Montgomery, Jhang, Shahpur, Gujranwala and Multan where *Punjab American* is grown under irrigation ; and (iii) the territory south of a line from Hissar to Ambala where a variety of *Bengals* known as *South-East Punjab* is grown.

Trade classification.	Staple.	Ginning percentage.	Estimated acreage in a normal season.	Average outturn (in bales of 400 lbs.,)
(1) <i>Sind Punjab</i> . . . . .	4/8"	33	1,400,000	330,000
(2) <i>Punjab American</i> . . . . .	7/8"	32 to 33	276,000	100,000
(3) <i>Bengals (S. E. Punjab)</i> . . . . .	4/8"	33	309,000	100,000

For the quinquennium ending 1922-23 the average acreage under cotton was 941,000, exclusive of 17,000 acres in Indian States. In

**United Provinces.** 1922-23 the area was 659,000 acres, including Rampur.

Practically the whole of the cotton of the province is sold under the commercial name *Bengals* with a staple of 3/8" to 4/8" for ordinary *Bengals* and of 4/8" to 5/8" for fine *Bengals*. Only 500 bales of Lancashire staple are at present produced.

Though grown all over the provinces, the chief areas for cotton lie in the west in the Bulandshahr, Muttra, Aligarh and Agra districts. About one-third of the total crop is irrigated. The chief varieties are the (1) *United Provinces*, (2) *white flowered Aligarh* (a variety selected by the Agricultural Department) and (3) *Cawnpore American* (grown only in canal irrigated areas).

Trade classification.	Length of staple.	Ginning percent-age.	Estimated acreage in a normal season.	Average turnout (in bales of 400 lbs.)
Bengals—				
United Provinces . . . . .	4/8" (average)	35 (average)	1,120,000	290,000
White flowered Aligarh . . . . .	3/8"	39	120,000	24,000
Cawnpore-American . . . . .	7/8" to 1"	31	2,000	500

For the five years ending 1922-23, the area under cotton in the Central India Agency averaged 1,328,000 acres. Of this Indore contributed about 477,000 acres, Gwalior 451,000 acres and Bhopal 141,000. The estimated area and yield in 1922-23 were 1,413,000 acres and 290,000 bales.

About 7 per cent of the crop, *viz.*, *Malwa* cotton, if marketed pure, comes under the description of Bombay staple. The main cotton-growing tract is the southern part of the western of the two detached areas of which the Agency is composed. *Malwa* cotton is grown on the Malwa plateau and elsewhere, the type known as *Central India*, both of which belong to the trade description *Oomras*.

In Rajputana the average area under cotton for the five years ending 1922-23 was 319,000 acres, exclusive of 36,000 acres in Ajmer-Merwara.

No long staple variety of cotton is produced. The cotton tracts of the Agency are in the east adjacent to those of the United Provinces and Central India. The cotton which belongs to the type known as *Rajputana* falls under the trade classification of *Bengals*.

The average area under cotton for the five years ending 1922-23 in Mysore was 105,000 acres. Most of the cotton grown satisfies the Lancashire definition of long staple. The chief areas are the Chitaldrug and Shimoga districts, where the types of the adjoining districts of Bombay are produced, *viz.*, *Kumpta* and *Dharwar-American*, aggregating about 22,000 bales annually.

During the five years ending 1922-23, the average area in Burma under cotton was 352,000 acres, as compared with about 245,000 acres in the previous quinquennium.

The whole crop is of short staple with the possible exception of *wa-gyi* which can be brought under the Bombay description if a regular staple can be evolved. The five chief districts, Thayetmyo, Sagaing, Lower Chindwin, Meiktila and Myingyan in the dry zone are devoted chiefly to *wa-gale* cotton which forms nearly seven-eighths of the crop.

On the borders of the dry and wet zones in the Thayetmyo and Prome districts *wa-gyi* cotton is cultivated, and in the Shan Hills, the type *Shan Hills*. Collectively the three varieties are called *Burmas*.

Trade classification.	Staple in inches.	Ginning percentage.	Estimated acreage in a normal season.	Average outturn (in bales of 400 lbs.).
<b>Burmas—</b>				
Wa-gale . . . . .	4/8" to 6/8"	30	} 350,000	58,000
Wa-gyi . . . . .	6/8"	39 to 40		
Shan Hills. . . . .	1"	25		

Exports of raw cotton from Burma in 1922-23 amounted to 61,000 bales of 400 lbs. each.

For the five years ending 1922-23, the average area under cotton in Bengal was 70,000 acres, in Bihar and Orissa 79,000 acres and in Assam 37,000 acres. In Bengal the chief producing areas are the Chittagong hill tracts, the districts of Bankura and Midnapore, and in Assam, the Garo and Lushai hills. The product of these areas is known as *Comilla* cotton. The acreage in Orissa is insignificant. In Bihar, the districts of Saran and the Santhal Parganas have more than 10,000 acres devoted to the crop, and with the Ranchi district they produce the cotton called *Bihar and Orissa*. A variety known as *Jathia* is found in scattered parts of the same province.

In 1922-23 the estimated yield of cotton in Bengal was put at 17,000 bales, in Bihar and Orissa at 15,000 bales and in Assam at 13,000, the total estimated area under the crop in the three provinces being 192,000 acres.

Trade classification.	Staple in inches.	Ginning percentage.	Estimated acreage in a normal season.	Average outturn (in bales of 400 lbs. each).
Comillas . . . . .	3/8" to 4"	45	98,000	30,000
Jathia . . . . .	5/8" to 6/8"	17	Figures not available.	
Bihar and Orissa . . . . .	3/8" to 4/8"	34	74,000	17,000

The exports of raw cotton from Calcutta in a normal year amount to about 85,000 bales.

For the five years ending 1922-23, the average acreage under cotton was 29,000 acres. The bulk of the crop is grown under irrigation in the Peshawar and Dera Ismail Khan districts and is known in the trade as *North-West Frontier Province*. Its ginning percentage is 32, and as the length of its staple is only from 5/8" to 6/8", it scarcely satisfies the Bombay standard of long staple.

In 1922-23 the estimated area and yield were 15,600 acres and 3,000 bales only.

In the following table the average prices of typical grades of cotton on the Liverpool and Bombay markets are contrasted. In 1913 the figures for Liverpool and Bombay respectively were 7d and 6-3d.

TABLE No. 42.—Average prices of American middling cotton at Liverpool and good Broach cotton at Bombay during the last ten years, in pence and decimals of a penny per lb.

Year.	Liverpool.	Bombay.
	d.	d.
1914 . . . . .	6-5	5-9
1915 . . . . .	6	4-2
1916 . . . . .	9	5-9
1917 . . . . .	16-66	9-4
1918 . . . . .	23-33	13-3
1919 . . . . .	20-33	13
1920 . . . . .	24-5	10-3
1921 . . . . .	10	6-6
1922 . . . . .	12-56	10-5
1923 . . . . .	16-73	10-2

Exports. The effect of the enormous rise in price during the war period is illustrated by the value obtained for reduced exports.

TABLE No. 43.—Quantity and value of raw cotton exported from India from 1913-14 onwards.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	10,626,312	27,361,655
1914-15 . . . . .	10,349,045	22,325,631
1915-16 . . . . .	8,853,967	16,619,247
1916-17 . . . . .	8,912,302	24,067,506
1917-18 . . . . .	7,308,105	28,438,272
1918-19 . . . . .	3,679,001	20,655,709
1919-20 . . . . .	8,566,600	39,101,601
1920-21 . . . . .	7,411,700	27,752,506
1921-22 . . . . .	10,676,040	35,978,853
1922-23 . . . . .	12,007,940	47,316,225

When the trade is classified according to the port from which shipment is effected, the preponderating share of Bombay is clearly emphasized. Exports from all other ports, except Rangoon, were in 1922-23 below pre-war levels.

TABLE No. 44.—Exports of raw cotton from different ports in 1913-14, 1914-15 and from 1918-19 onwards.

Year.	Bombay.	Karnahi.	Calcutta.	Rangoon.	Tuticorin.	Madras.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
1913-14 . . . . .	7,609,286	1,493,736	567,423	169,797	393,035	235,821
1914-15 . . . . .	7,763,701	1,445,935	359,595	167,521	383,891	147,689
1918-19 . . . . .	3,211,800	15,580	92,940	191,872	107,524	3,360
1919-20 . . . . .	6,910,720	319,980	47,540	267,372	443,120	147,160
1920-21 . . . . .	5,843,640	769,740	259,860	179,340	253,160	87,700
1921-22 . . . . .	8,628,620	724,900	637,180	326,280	268,160	69,100
1922-23 . . . . .	9,768,100	1,323,200	355,600	219,120	185,720	148,800

The bulk of the shipments has always gone to the Far East and the Continent, and Lancashire depends to an insignificant extent upon Indian cotton. Even during the war the estimated consumption of East Indian cotton in the United Kingdom was considerably less than 100,000 bales, as compared with 500,000 of Egyptian and over 2,000,000 of American cotton. In 1921-22 deliveries of East Indian cotton to spinners in Great Britain amounted to no more than 36,000 bales, but in 1922-23 the total fell little short of 90,000 bales. In the last two years there have been remarkable increases recorded in exports to China for the Shanghai mills, and if the Chinese tariff encourages the expansion of the spinning industry, the future may disclose yet further increases in shipments to that quarter. In 1922-23 Japan took 48 per cent of the total exports as compared with 59 per cent in 1921-22. Great efforts are being made to extend the area under cotton in Japan and Korea, and importations of American cotton are larger than formerly. Though the effect of the earthquake upon her cotton consumption is likely to be only temporary, the other reasons indicated suggest that Japan's requirements of Indian cotton are not likely to expand much further.

India's imports of raw cotton amounted to 200,000 tons in 1922-23, of which 50 per cent, mainly Uganda cotton, came from Kenya Colony, but much of this was re-exported to the United Kingdom and Japan.

TABLE No. 45.—*Distribution of the exports of raw cotton among principal importing countries.*

Countries.	1913-14.	1919-20.	1920-21.	1921-22.	1922-23.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
Japan . . .	4,817,560	5,918,980	3,353,620	6,286,660	5,789,300
Germany . . .	1,688,070	173,600	719,180	838,360	939,600
Belgium . . .	1,133,083	490,840	867,560	708,220	900,220
Italy . . .	848,576	554,260	760,320	551,400	861,880
Austria . . .	747,041	31,440	121,960	119,560	151,900
Hungary . . .					
France . . .	524,264	204,280	137,340	202,440	451,140
United Kingdom . . .	384,914	532,280	342,880	127,900	682,620
Spain . . .	166,933	184,640	273,500	107,740	284,520
Hongkong . . .	109,581	46,260	49,580	26,820	10,160
China . . .	84,707	275,960	635,360	1,628,340	1,765,900
Holland . . .	28,922	54,000	42,200	19,160	34,340
United States of America . . .	26,482	63,380	38,500	32,780	77,960
Russia . . .	26,327	..	..	..	..
Other countries . . .	39,852	66,660	74,700	126,760	108,400
<b>TOTAL . . .</b>	<b>10,626,312</b>	<b>8,568,600</b>	<b>7,411,700</b>	<b>10,676,040</b>	<b>12,007,940</b>

With these exports must be contrasted the estimated consumption of indigenous cotton by Indian mills, which is arrived at by deducting the quantity of raw cotton imported from the gross figures of mill consumption. No exact estimate of extra-mill or domestic consumption is possible, but 750,000 bales of 400 lbs. each is probably fairly accurate. The quantity of

hand-spun cotton may, owing to intensive propaganda, have increased somewhat in the last three years but handloom weavers generally depend for the bulk of their requirements upon yarn from the mills.

TABLE No. 46.—*Net consumption of indigenous cotton by Indian power mills.*

Year ending 31st August.	Approximate quantity consumed.	Less imports of raw cotton.	Net consumption.
	Cwts.	Cwts.	Cwts.
1914 . . . . .	7,500,941	24,779	7,476,162
1915 . . . . .	7,359,212	88,225	7,270,987
1916 . . . . .	7,692,013	21,847	7,670,166
1917 . . . . .	7,892,574	40,991	7,851,583
1918 . . . . .	7,299,873	93,829	7,206,044
1919 . . . . .	7,154,805	53,300	7,101,505
1920 . . . . .	6,833,113	77,680	6,755,433
1921 . . . . .	7,420,805	404,060	7,016,745
1922 . . . . .	7,712,390	384,080	7,328,310
1923 . . . . .	7,530,943	220,980	7,309,963

The differences with regard to ginning, baling and pressing are almost as many as the varieties of cotton grown. In the Punjab and Burma, for instance, the ginners buy the seed cotton, elsewhere they mostly gin on commission. In the south of India, however, where the ginners are also exporters, they buy only the lint after ginning. The greater part of the crop is machine ginned, but except in Dharwar where the American saw gin is used, chiefly with roller gins. In many of the more important cotton growing centres the big European cotton exporters have their own gins.

Though the loose bundles of ginned cotton, if intended for Indian mills, are sometimes only half pressed in old fashioned screw presses, the bulk is steam pressed in steel hooped bales upcountry and so railed down to the port.

The density of the pressing varies from 45 to 65 lbs. per cubic foot. Three-quarters of the Indian cotton crop is sent to Bombay where it used to be stored in the open air on the Cotton Green at Colaba,

**Bombay cotton trade control.** exposed not only to the weather but also to serious risk of fire. In March 1923 the new cotton depôt at Sewri was formally inaugurated.

Until recently there was no single body controlling dealings in raw cotton and transactions were carried on under the rules of either the Bombay Cotton Trade Association or the Bombay Cotton Exchange, mostly of the former, though adhesion to either set of rules was voluntary. In July 1918 all cotton transactions in Bombay were placed under the control of the Cotton Contracts Board, originally appointed under the Defence of India rules but subsequently constituted under Bombay Act I of 1919. Upon the repeal of this Act, Bombay Act XIV of 1922 was passed giving the East India Cotton Association statutory powers similar to those possessed by the Cotton Contracts Board, to secure due regulation of the trade; and the constitution and

administrative machinery as set out in the articles of association were declared to be lawful. This Act will continue in force for three years and for such period thereafter as the Governor of Bombay in Council may, by notification, direct.

Under the Indian Cotton Cess Act (XIV of 1923) a cess of two annas per standard bale of four hundred pounds avoirdupois, or, in the case

**Cotton Cess.** of unbaled cotton, of six pies per hundred pounds avoirdupois, has been imposed on all cotton produced in India and either exported from any customs-port to any port outside British India or consumed in any mill in British India, provided that the cess shall be levied and collected at double the above rates until the expiry of three years from the commencement of this Act. By the Indian Cotton Cess (Amendment) Act I of 1924, the cess has been imposed on all cotton produced in India and exported by land from British India to any foreign territory outside India, which the Governor-General in Council may specify by notification in the Gazette of India. The funds, derived therefrom, are placed for administration in the hands of the Indian Central Cotton Committee, whose constitution and functions, based upon the recommendation of the Indian Cotton Committee, are laid down in the Act. The Act has not only permanently incorporated the Central Committee but provided it with funds to employ upon the improvement of cotton growing and marketing and research work in connection therewith. In addition to a programme of provincial research, money has also been earmarked for technological research under the Committee's own control and a technological laboratory and experimental spinning plant are under erection at Matunga (Bombay). Research studentships to the number of six have also been instituted.

The units vary at the different ports. In Bombay the unit of sale is the candy of 784 lbs., in Karachi the maund of 84 lbs., in Calcutta

**Unit of sale and shipment.** the bazaar maund of  $82\frac{2}{3}$  lbs., and in the south the candy of 500 lbs. generally. Quotations for export to the United Kingdom are generally per lb. c.i.f. Shipment is made from Bombay in bales of 392 to 500 lbs. and from Karachi in bales of 400 lbs. Calcutta adopts the bale of 392 lbs., while at the Madras ports the weight varies from 400 to 500 lbs.

For freight purposes all cotton is taken on measurement, one ton being equal to 40 cubic feet. Ordinarily one hundred bales of 400 lbs.

**Freight.** each will measure between 25 and 26 tons.

In Tuticorin, however, where *Cambodia* and *Tinnevellies* are usually shipped in bales weighing 500 lbs. the compression is so great that one hundred bales measure only 19 tons approximately, i.e., five bales to the ton.

*Kapok* or silk-cotton, which may be conveniently noticed here, is the floss obtained from the seed capsules of the white flowered *eriodendron*

**Kapok.** *anfractuosum*,\* which grows in the hot moist tracts of western and southern India and of Burma. The fibre is too short, light and smooth to be easily spun unless as an admixture with other flosses, and its chief use is in upholstery for

\* *Bombax pentandrum*, Linn.

filling cushions, etc., where it has the advantage, unlike ordinary cotton, of not readily balling. On account of its buoyancy and freedom from water logging, it is also in great demand for life belts. The chief sources of supply for the European markets are the Dutch Indies and, to a smaller extent, Ceylon where the tree is widely cultivated for the floss, while in India, no systematic planting has yet been attempted and the export was, until recently, so insignificant that no separate statistical records were kept of it. Even now while the internal trade has developed considerably, the quantity shipped is small and probably the total is swelled by consignments of the floss obtained from the *bombax malabaricum*, the red silk cotton tree, which is of much commoner occurrence in India than the white, but is incorrectly called *kapok*. In 1914-15 the total was 16,000 cwts, in 1917-18 11,000 cwts and in 1919-20 27,000 cwts, the chief markets being the United Kingdom and Italy. The totals for the next two years were 9,000 and 8,000 cwts only, but there was a considerable recovery made in 1922-23, when 24,000 cwts valued at £83,000 were exported. Shipments were chiefly to Germany, the Netherlands, the United Kingdom, and France from the ports of Calcutta and Bombay.

The unit of sale in Calcutta is the pound and shipment is made in pressed bales, rope-bound, weighing two maunds nett. In Bombay sales are per candy of 784 lbs. or per maund of 28 lbs. while shipment is effected in pressed bales weighing from 2 to 2½ cwts. Quotations for export to the United Kingdom are per lb. *c.i.f.*

### COTTON MANUFACTURES.

Of the cotton produced in India it may be said in general terms that about two-thirds is exported raw, while the balance is manufactured into yarn and cloth in Indian mills. The chief centre of the cotton manufacturing industry as of the trade in raw cotton is Bombay. Cotton manufactures now represent about 22 per cent of the total value of Indian manufactures exported and about 6 per cent of the total export trade of the country. The first cotton mill in India was started in 1838 at Ghosery near Calcutta and the first to be opened in Bombay dates from 1853 with 5,000 throstle spindles. At the end of March 1923 the total number of mills in existence was 289, giving employment to 356,758 persons.

Between 1898 and 1918 the number of spindles increased by nearly 50 per cent and the number of looms by 211 per cent but the tendency during the last fifteen years has been to enlarge existing mills rather than open new ones. Indeed India at the outbreak of war ranked as fourth among the countries of the world manufacturing cotton textiles, being exceeded by Great Britain, the United States and Germany only. The table below shows the progress made during the last forty-five years.

TABLE NO. 47.—*Progress of the cotton spinning and weaving industry in India since the year 1879-80.*

Year.	Number of mills in existence.	NUMBER OF		
		Persons employed.	Looms.	Spindles.
1879-80	58	39,537	13,307	1,470,830
1888-89	109	92,126	22,156	2,670,022
1898-99	174	156,132	37,288	4,463,342
1908-09	233	236,827	74,592	5,966,530
1909-10	245	232,381	80,171	6,142,551
1913-14	264	260,947	96,688	6,820,576
1914-15	255	260,440	103,311	6,698,108
1915-16	267	275,871	108,417	6,875,688
1916-17	267	277,370	110,812	6,870,162
1917-18	269	284,054	114,805	6,614,269
1918-19	264	290,255	116,094	6,590,918
1919-20	263	305,511	117,558	6,714,265
1920-21	255	328,132	117,958	6,652,474
1921-22	271	341,944	128,314	6,814,273
1922-23	289	356,758	137,238	7,245,119

Of the total number of mills in India 200 are in the Bombay Presidency, 12 in Bengal, 15 in the United Provinces, 15 in Madras, 9 in the Central Provinces and Berar, 3 in the Punjab, 3 in Delhi, 2 in Ajmer-Merwara, 3 in French India and the rest in Indian States, chiefly in Central India and Baroda. The mills of the Bombay Presidency (chiefly situated in Bombay City and Ahmedabad) produce 70 per cent of the yarn spun and 79 per cent of the cloth woven. As far as could be ascertained in the Census of 1921 there are about two millions of hand-loom all over India working chiefly with yarn supplied from spinning mills though hand spinning has not altogether died out. The statement below originally compiled by the Industrial Commission and now brought up to date indicates that the mill-made and foreign yarn available for handloom weavers averaged indicates in the six years, 1908-09 to 1913-14, over 250 million lbs. annually (after allowance had been made for manufactures of rope and twine) against an estimated intra-mill consumption of 222 million lbs.\* and there has been, it will be noticed, remarkably small variation in this figure in the last six years though there has been a great increase in mill consumption.

\* Report of the Indian Industrial Commission—Appendix I, p. 8.

TABLE NO. 48.—Quantity in thousands of lbs. of mill-made and foreign yarn available for handloom weavers.

Particulars.	Average of 1896-97— 1901-02.	Average of 1906-09— 1913-14.	Average of 1917-18— 1922-23.	
	Lbs.	Lbs.	Lbs.	
1. Yarn imported	by sea . . . . .	44,056	41,749	39,388
	by land . . . . .	1	80	21
2. Yarn made in Indian mills . . . . .	473,000	648,559	661,786	
TOTAL	517,957	690,388	701,195	
3. Yarn* exported . . . . .	by sea . . . . .	209,398	200,831	94,243
	by land . . . . .	7,610	14,632	11,793
TOTAL	217,008	215,463	106,036	
4. Nett quantity available in India . . . . .	300,949	474,925	595,159	
5. † Cloth made in Indian mills . . . . .	98,729	248,918	381,849	
6. ‡ Equal to yarn . . . . .	88,151	222,248	340,937	
7. Yarn (mill-made) available for handloom weavers (item 4-6).	212,798	252,677	254,222	

\* Including re-export.  
† All woven goods.  
‡ Calculated at the rate of 100 lbs. yarn=112 lbs. cloth.

**Production of yarn.** The yarn produced in Indian cotton mills in the last eleven years is shown in the next table. The figures for Bombay, Madras, and the Indian States in 1922-23 mark a substantial advance of those for 1913-14, while in Bengal and the Central Provinces there is a corresponding decline.

TABLE No. 49.—Abstract statement of the quantity (in pounds) of yarn produced in the cotton mills in India during the last fifteen years.

Year.	Bombay.	Madras.	Bengal.	United Provinces, also Ajmer-Merwara.	Punjab (including Delhi).	Central Provinces and Berar.	Indian States and foreign territory.	GRAND TOTAL.
1908-09	469,194,256	39,635,423	39,146,723	38,870,997	13,265,405	29,773,277	27,669,078	657,585,159
1909-10	437,484,282	40,595,993	34,419,392	39,801,222	10,936,800	30,186,255	34,157,621	627,581,562
1910-11	424,902,640	41,070,719	33,278,828	36,205,427	8,224,423	28,314,423	32,980,681	609,927,141
1911-12	441,521,380	42,838,086	32,625,497	39,487,426	6,630,835	27,738,443	34,188,532	625,030,199
1912-13	485,566,927	44,974,138	37,355,113	43,705,289	5,321,927	33,581,772	37,890,324	688,455,490
1913-14	479,682,975	44,673,626	33,219,947	44,469,505	6,274,754	36,532,870	37,924,174	682,776,851
1914-15	443,556,493	43,031,691	31,708,798	50,281,135	6,813,549	34,565,150	37,027,841	651,984,667
1915-16	509,770,810	44,303,310	32,096,459	51,999,121	7,541,825	37,443,174	39,269,880	722,424,579
1916-17	482,147,956	44,187,107	28,568,029	48,753,354	6,452,738	34,337,717	36,660,330	681,107,231
1917-18	466,972,125	43,092,929	32,881,683	41,290,033	7,097,424	33,466,316	33,775,105	660,575,615
1918-19	427,638,345	42,787,344	32,507,148	36,447,155	6,900,776	34,279,946	34,479,750	615,040,464
1919-20	439,799,625	44,346,268	35,229,179	37,146,135	6,645,641	34,188,442	36,404,983	635,760,273
1920-21	469,944,960	41,240,677	33,392,116	39,091,048	6,717,075	31,269,565	38,347,156	660,002,597
1921-22	492,634,404	44,387,583	33,626,236	43,020,649	6,524,002	32,817,846	40,452,279	693,462,999
1922-23	497,351,824	53,425,405	28,937,591	43,821,522	6,522,193	31,877,488	43,937,420	705,873,443

In the early days of the industry Indian cotton manufacturers were concerned chiefly with the production of lower counts of yarn for shipment to China and for use on indigenous handlooms, but the tendency in recent years has been to spin higher counts of yarn, supplementing Indian supplies with imported long staple cotton. The great difference between the Lancashire and Eastern cotton spinning industries may be illustrated by the following. Of the world's spindles 39 per cent are in the United Kingdom, but they consume only 16 per cent by weight of the world's cotton crop, while India and Japan with one-sixteenth of the total spindles employ one-fifth of the world's crop.

It is interesting to compare the imports of coarse, medium and fine yarns with the production of similar descriptions by Indian mills.

TABLE NO. 50.—Imports and production of cotton yarn in 1913-14 and 1922-23 contrasted.

Yarn.	1913-14.			1922-23.		
	Quantity in lbs.	Percentage of class.	Percentage of total.	Quantity in lbs.	Percentage of class.	Percentage of total.
Nos. 1 to 25—			85-21			84-66
Indian . . .	616,888,000	99-85		833,561,000	97-86	
Imported . .	2,150,000	85		13,870,000	2-14	
Nos. 26 to 40—			12-40			13-23
Indian . . .	62,711,000	69-64		60,803,000	69	
Imported . .	27,344,000	30-86		31,365,000	31	
Nos. above 40—			1-45			1-10
Indian . . .	2,698,000	25-56		2,195,000	26-08	
Imported . .	7,859,000	74-44		6,222,000	73-92	
<b>TOTAL . . .</b>	<b>726,260,000*</b>	<b>..</b>	<b>100</b>	<b>764,934,000*</b>	<b>..</b>	<b>100</b>

\* Includes imports of mercerised and unspecified descriptions of twist and yarn.

In 1912 and 1913 there had been a marked decline in the spinning of counts between 31 and 40 in Indian mills, but while the war lasted Indian mills spun less and less of the lower counts. Of counts 1 to 10 the total was 87 million lbs. in 1918-19, as compared with 130½ million lbs. in 1913-14, and the drop in counts 11 to 20 was about 47 million lbs. On the other hand, in counts above 20 there was a considerable rise, particularly in counts above 40, which may be due partly to the demands of the handloom weavers of finer products which importers were for a variety of reasons unable to satisfy. Though India should be able to command considerable quantities of long staple cotton from Uganda there has been, it will be seen, a substantial fall in the spinning of counts above 40 since the armistice, the total for 1918-19 being 4,786,000 lbs., as compared with 2,195,000 lbs. in 1922-23. A marked increase in the imports of yarns of the lowest counts, chiefly from Japan, which rose from 2,150,000 lbs. in 1913-14 to 8,450,000 lbs. in 1918-19 and again to 13,870,000 lbs. in 1922-23, must also be recorded.

In the next table will be found the estimated production of woven goods in all the power mills in India during the last four years. No exact estimate of the production of the hand-  
**Production of woven goods.** looms scattered over the country can be attempted, but it is probably in the neighbourhood of 250,000,000 lbs.\*

TABLE NO. 51.—*Abstract statement of the quantity (in lbs.) of woven goods produced in the cotton mills in India during the last four years.*

Manufactures.	1919-20.	1920-21.	1921-22.	1922-23.
	Lbs.	Lbs.	Lbs.	Lbs.
Grey and bleached piecegoods	276,711,225	263,564,482	300,036,343	300,342,165
Coloured piecegoods	102,146,318	98,387,636	98,432,961	98,634,842
Grey and coloured goods other than piecegoods.	3,320,418	3,484,852	3,052,986	3,422,967
Hosiery	293,738	410,784	363,099	438,932
Miscellaneous	1,250,221	1,407,508	1,432,958	2,201,290
Cotton goods mixed with silk or wool.	203,830	226,529	177,750	164,726
<b>TOTAL</b>	<b>383,325,750</b>	<b>367,481,791</b>	<b>403,496,097</b>	<b>405,204,922</b>

The corresponding total in 1915-16 was 352,000,000 lbs. The only important variation is under the head of grey and bleached piecegoods which now account for 75 per cent of the total. The proportion of coloured goods has declined since the war, but as the above table shews the volume of production has been remarkably steady during the last three years. The increase under the head 'miscellaneous' is attributed to the manufacture on a larger scale of mill-made 'khadder'.

TABLE NO. 52.—*Quantity and value of exports of principal cotton manufactures.*

Year.	YARN.		PIECEGOODS.	
	Quantity.	Value.	Quantity.	Value.
	(Unit of 1,000 lbs.)	£	(Unit of 1,000 yards.)	£
1913-14	197,978	6,554,873	89,233	1,424,583
1914-15	133,619	4,190,987	67,194	1,058,489
1915-16	160,231	4,615,244	113,465	1,644,624
1916-17	163,980	5,239,393	263,845	3,650,823
1917-18	121,798	5,043,141	189,450	3,692,162
1918-19	63,798	4,515,548	149,088	4,301,727
1919-20	151,870	12,175,822	196,555	5,624,103
1920-21	82,535	6,781,023	146,365	5,004,202
1921-22	81,033	5,143,046	160,967	4,987,026
1922-23	56,861	3,651,740	156,951	4,689,027

The exports of yarn were, before the war, four or five times as valuable as the exports of piecegoods, but these latter have greatly increased since 1916-17 and in 1922-23 for the first time exceeded the former in value. As in pre-war

\* Calculated according to the formula approved by the Bombay Millowners' Association that 100 lbs. of yarn yield 112 lbs. of cloth.

times the chief participants are China (chiefly through Hongkong), Egypt (for the Levant), the Straits and Aden. The fall in the total volume of exports in 1918-19 was due to the high rates prevailing for raw cotton in India and though there was a marked recovery in the following year, competition in the Far Eastern market with cheaper Japan spun yarn has latterly seriously affected the volume of Indian exports.

The exports of yarn to foreign destinations in 1922-23 are shewn in the next statement according to the port of shipment. Bombay has always enjoyed a preponderating share of the trade.

TABLE No. 53.—Quantity of cotton yarn and twist exported in 1922-23 and the share of the principal ports.

Port.	Quantity.	Percentage.
	Lbs.	
Bombay . . . . .	55,992,348	98.5
Tatsoorn . . . . .	496,810	8
Calcutta . . . . .	299,576	6
TOTAL . . . . .	56,861,490	100

The exports of cotton manufactures other than yarn still represent less than 10 per cent of the total output of the mills, but have substantially increased in recent years. 77 per cent of the total trade in 1922-23 was from Bombay and 22 per cent from Madras. The exports of cotton manufactures, classified according to descriptions, have been as follows.

TABLE No. 54.—Values of the exports of cotton manufactures (other than yarn and twist) in 1913-14 and from 1918-19 onwards, classified according to descriptions.

Descriptions of cotton manufactures.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
Piecegoods—	£	£	£	£	£	£
Grey . . . . .	473,892	1,224,344	1,972,653	1,478,643	657,285	782,985
White . . . . .	11,912	96,080	61,189	73,047	37,770	32,751
Coloured, printed and dyed.	938,779	2,980,863	3,790,261	3,452,512	4,291,971	3,893,292
Handkerchiefs and shawls.	54,385	50,599	138,769	217,433	57,827	165,449
Sewing thread . . . . .	11,870	14,027	27,044	16,842	22,079	20,643
Hosiery . . . . .	9,898	19,994	19,753	7,541	10,879	10,538
Other sorts . . . . .	24,563	158,759	92,459	153,844	213,154	179,727
TOTAL . . . . .	1,525,099	4,544,666	6,102,728	5,399,862	5,290,765	5,056,385

The declared value per yard of grey, white and coloured piecegoods in 1922-23 was 5 as. 11 pies, 7 as. 6 pies and 7 as. 6 pies, respectively, as compared with 2 as. 7 pies, 6 annas and 6 annas in 1913-14.

The chief markets for cotton cloth woven in India are those colonies and countries in which there is considerable Indian immigration.

Bombay is the principal port of shipment for *chadars* and *dhootis*, *T. cloths*\* and

**Chief markets.**

\* A grey calico, so called from an old trade mark.

*domestics*, the principal destinations being Aden, East Africa (including 'German' and Portuguese East Africa), Persia, Zanzibar, the Straits and Baluchistan (*viâ* Karachi), while coloured *tungis* and *saris* which go chiefly from Madras are shipped to the Straits Settlements, Ceylon and Sumatra.

As an example of handloom weaving for export, the trade in Madras handkerchiefs may be cited, which are shipped to the United Kingdom, though their ultimate destination is chiefly Africa. These so-called 'handkerchiefs' are made with 40s to 60s in pieces 8 yards by 3. The value of these exported in 1922-23 exceeded £145,000.

Two main varieties of cotton carpets may be distinguished as made in India, one resembling the woollen pile carpet but with warp, weft and pile all of cotton yarn, and the commoner kind without any pile and with the same design on both sides. The latter are produced in three principal forms—*daris* (bed carpets), *shatranjis* (floor carpets) and *jainamaz*\* (prayer mats). This distinction of terms is not however strictly observed and all pileless cotton carpets are commonly designated *daris*. In the *dari* proper, the pattern generally consists of stripes of various colours, blue and white being the favourite combination, but flowers and geometrical shapes are not infrequently woven into the body of the fabric. The looms on which *daris* are woven are generally horizontal and the dyes formerly in use were indigenous vegetable dyes, principally indigo, but the cheapness of aniline dyes has led to the increasing adoption of the latter. The weavers in most of the provinces are poor Mahomedans or low caste Hindus and the organisation of the trade largely depends on a system of advances by *mahajans* or middlemen who sell the outturn at the big trade centres. *Daris* properly so called are generally purchased in the piece, while floor carpets are sold by the yard or by weight.

The chief centres of manufacture are Bareilly, Aligarh, Agra, Cawnpore, Farukhabad, Moradabad and Etawah in the United Provinces. The *daris* of Agra are noted for their finish, those of Bareilly for their cheapness and durability and of Aligarh for the closeness of the stitch. The industry is expanding in Cawnpore where large mills under European and Indian management are manufacturing with machinery larger sizes suitable for tents and bungalows and turning out considerable quantities for export to England and America. Other provinces where cotton carpets are made are the Punjab, chiefly in the districts of Multan, Amballa and Hoshiarpur, the Delhi Province, the Bahawalpur State, Patna city, and the Champaran and Shahabad districts of Bihar and Ayyampet, Bhavani, Adoni and Kurnool in the Madras Presidency where the local name for these carpets is *jankalam*. In the Bombay Presidency a not inconsiderable industry is carried on in some of the Deccan districts. It is also a popular jail industry in nearly every province.

No separate statistics are maintained of the exports.

\* In the Central Provinces, *ja-namas*.

## GRAIN, PULSE AND FLOUR.

### Rice.

Although in favourable seasons, barley, millets and pulses are exported in considerable quantities from India, the most valuable exports, included under the head 'Grains and Pulses', have invariably been rice and wheat, their aggregate values representing about 90 per cent of the whole. The world production of cleaned rice has been calculated\* as in the neighbourhood of 60,000,000 tons, exclusive of an entirely empirical estimate of 30,000,000 tons for China. India's share of this grand total of 90,000,000 tons may be taken approximately at 35 per cent and though her average exports seldom exceed 5 per cent of her total estimated production, she is nevertheless the largest exporter of rice in the world. India's export trade in rice is less susceptible to seasonal influences than is the case of the majority of food grains because in Burma, which contributes the greater part of it, a failure of the rains is unknown. The volume of export to foreign countries is, however, affected by crop shortage in other parts of India.

The acreage and production of cleaned rice in British India in the last ten years are as indicated in the following table.

TABLE NO. 55.—*Acreage and production of cleaned rice in British India from 1913-14.*

Year.	Area.	Production.	Exports (rice not in the husk).	Percentage of 4 to 3.
1	2	3	4	5
	Acres.	Tons.	Tons.	
1913-14 . . . . .	76,908,000	30,138,000	2,419,850	8
1914-15 . . . . .	77,669,000	28,244,000	1,538,300	5½
1915-16 . . . . .	78,680,000	33,206,000	1,339,800	4
1916-17 . . . . .	80,988,000	35,442,000	1,588,979	4½
1917-18 . . . . .	80,668,000	35,773,000	1,939,450	5
1918-19 . . . . .	77,613,000	24,318,000	2,017,900	8
1919-20 . . . . .	78,706,000	31,719,000	617,600	2
1920-21 . . . . .	78,120,000	27,442,000	1,059,900	4
1921-22 . . . . .	79,700,000	32,605,000	1,366,500	4
1922-23 . . . . .	80,877,000	32,947,000	2,087,900	6

\* Bulletin of the Imperial Institute, Vol. XV, April—June 1917, page 254.

In addition, there is an estimated production in the Indian States which is roughly placed at 1,000,000 tons. The yield per acre for British India is about 8½ cwts, which compares very unfavourably with Japan and Egypt, where it is between 21 and 22. The area in the principal provinces in 1922-23 and their percentage are shewn below. The percentages are, in years of normal rainfall, subject to very little variation.

TABLE No. 56.—*Acres under rice according to provinces in 1922-23.*

Provinces.	Acres.	Percentage.
Bengal	21,773,000	27
Bihar and Orissa	15,350,000	19½
Burma	11,288,000	14
Madras	11,286,000	14
United Provinces	7,016,000	8½
Central Provinces and Berar	5,143,000	6
Assam	4,624,000	5½
Bombay (including Sind)	3,058,000	3½
Punjab	929,000	1
<b>TOTAL FOR BRITISH INDIA</b>	<b>90,577,000</b>	<b>100</b>

Rice in the husk before hulling is known as *paddy*. After hulling it becomes *rough rice* and after pearling it becomes *cleaned or white rice*.

**Terms employed.** The broken grains of rice are separated out and sold as *coodie or khoo*, while the higher grades of rice are subject to a further process of polishing on sheepskins with the object of removing any rice meal which may adhere to the grain. No chemicals whatever are used in this polishing process or in any other process connected with the milling of rice. *Cargo rice* contains 5 to 20 per cent of unhusked rice, *i.e.*, paddy, and, if exported in this form to Europe, is subject to further milling on arrival there. The ratio of paddy to rice by weight depends entirely on the quality of rice produced. In the case of *specials* it may be taken as of 8 : 5, but the ratio for better qualities is lower.

For *boiled rice* there is no market in Europe, but there is a considerable demand for the grain in this form in India and also in countries where Indian labour is employed such as the Federated Malay States and Ceylon. The process may be roughly described as follows. The paddy is soaked in water for forty to eighty hours according to grain and season and boiled for twenty to forty minutes and dried before husking. This business is largely in the hands of small millers in out of the way places where there is plenty of room to spread the rice after steaming to dry in the sun, though artificial drying is not unknown. This parboiled rice has a higher nutrient value, owing to its lighter milling and though when husked it has a yellow tinge it becomes white when cooked and keeps better afterwards, which is a great asset when rice is prepared overnight to be eaten the following day. Attempts are being made in Rangoon to evolve a more scientific process for the production of parboiled rice but it cannot be said that any entirely satisfactory plant has yet been devised.

For statistical purposes, foreign and coastwise exports of rice are divided up into two heads—rice in the husk (paddy) and rice not in the husk (rice), but the volume of the former seldom exceeds 50,000 tons in the year, the chief destination being Ceylon. Rice not in the husk includes boiled rice.

Exports.

TABLE No. 57.—Exports of rice according to provinces from 1909-10 in round figures.

Year.	PROVINCES.				TOTAL.	
	Burma.	Bengal.	Madras.	Bombay and Sind.	Quantity.	Value.
	Tons.	Tons.	Tons.	Tons.	Tons.	£
Pre-war years— Annual average for quinquennium—1909-10 to 1913-14.	1,814,000	374,000	121,000	60,000	2,369,000	15,107,000
War years— Annual average for quinquennium—1914-15 to 1918-19.	1,271,000	107,000	175,000	131,000	1,684,000	12,688,000
Post-war years— 1919-20 . . . . .	492,000	48,000	2,000	76,000	618,000	6,808,000
1920-21 . . . . .	634,000	11,000	6,000	109,000	1,060,000	11,928,000
1921-22 . . . . .	1,214,000	12,000	58,000	87,000	1,366,000	16,875,000
1922-23 . . . . .	1,768,000	207,000	51,000	70,000	2,088,000	23,133,000

Burma practically has a monopoly of the export trade in rice and also makes good any shortage in the supply for local consumption in other parts of India, because the ratio of acreage under rice to population is so high that her exportable surplus is far larger than that of Bengal, Bihar or Madras who grow more rice but have to meet a much higher internal demand. The Burma trade represents 86 per cent of the whole. The Madras trade is practically confined to Ceylon.

Any failure of the monsoon in India at once creates a remarkable inflation of values in Burma to which the range of prices in foreign markets does not usually respond. Prior to 1910-11 the average export of rice from India did not exceed two million tons; but the trade subsequently expanded and in 1912-13 the total exports amounted to a little less than 2½ millions. The fall from this level, between 1919-20 and 1921-22, is attributable to the strict control of rice exports enforced by the Government of India.

The principal causes of the shrinkage in exports from Burma and Bengal in the first three war years were the loss of enemy markets and shortage of shipping. The increasing volume of exports direct to the United Kingdom, which was a feature of the war years, has not been maintained since the armistice.

TABLE No. 58.—Direct exports of rice to the United Kingdom in 1913-14 and during the last five years.

	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
Tons . . . . .	161,409	270,143	57,473	170,064	108,116	78,737

Before the war a good deal of Indian rice was cleaned and polished in Germany and Holland before it reached the United Kingdom. The pre-war freight rate to the United Kingdom from Rangoon for rice was in the neighbourhood of 25 shillings per ton: at the time of the declaration of the armistice the Government rate was 125 shillings and for outside steamers 400 shillings and upwards. The present rate is 27s. 6d.

The principal countries participating in the export trade in rice in the year before the war and in 1922-23 are shown in the table sub-joined.

TABLE No. 59.—Quantities and values of rice exported from India in 1913-14 and 1922-23 classified according to destinations.

Destinations.	1913-14.			1922-23.		
	Tons.	Per cent.	£	Tons.	Per cent.	£
Ceylon . . . . .	335,050	13.0	3,102,450	302,927	17.4	4,404,325
Straits Settlements, including Labuan.	224,569	11.8	1,915,929	173,648	8.8	1,842,185
United Kingdom . . . . .	161,400	8.7	1,129,977	79,737	3.8	853,249
Egypt . . . . .	53,884	2.3	371,007	95,133	4.5	1,104,315
Mauritius and Dependencies . . . . .	51,344	2.1	503,988	66,064	3.2	903,664
Other British Possessions . . . . .	144,873	6.0	1,189,541	233,438	13.6	3,232,313
<b>TOTAL BRITISH COUNTRIES . . . . .</b>	<b>1,031,163</b>	<b>42.6</b>	<b>3,271,732</b>	<b>1,059,942</b>	<b>50.6</b>	<b>12,435,520</b>
Holland . . . . .	333,732	13.8	2,024,321	63,603	3.1	620,858
Germany . . . . .	315,895	13.1	2,094,054	340,150	13.3	3,542,533
Austria . . . . .	211,442	8.7	1,370,932	6,400	3	78,933
Hungary . . . . .				..	..	..
Japan . . . . .	160,846	6.6	1,076,386	79,526	3.9	842,911
Asiatic Turkey . . . . .	31,057	3.4	665,869	1,005	0	14,407
Java . . . . .	39,412	1.6	261,153	75,765	3.6	757,021
France . . . . .	23,979	0.9	162,973	3,343	1	30,738
Italy . . . . .	900	0.4	8,110	3,950	2	41,521
Other Foreign Countries . . . . .	221,937	9.26	1,672,493	454,756	21.3	4,798,917
<b>TOTAL FOREIGN COUNTRIES . . . . .</b>	<b>1,368,700</b>	<b>57.4</b>	<b>9,327,800</b>	<b>1,027,997</b>	<b>49.2</b>	<b>10,607,592</b>
<b>ALL COUNTRIES . . . . .</b>	<b>2,419,863</b>	<b>100</b>	<b>17,599,532</b>	<b>2,087,939</b>	<b>100</b>	<b>23,133,212</b>

Of India's total exports about 47 per cent went in pre-war days to Europe, 42 per cent to other Asiatic countries (Ceylon, the Straits Settlements, Japan, etc.), the remaining 11 per cent

being distributed amongst Africa, the West Indies and South America. About half the volume of exports is for consumption as food, the remainder being utilized partly for food and partly for the manufacture of spirits and starch.

The exports to Java vary according to the quantities which that country is able to obtain from Indo-China and Siam and the prices ruling in those markets. In 1910-11 and 1911-12 they exceeded a quarter of a million tons and in 1912-13, 160,000 tons. While India exported about 1,400,000 tons to foreign countries in the last pre-war year, Siam and Indo-China, the next most important exporting countries, supplied an

almost equivalent quantity to British countries (1,300,000 tons). Ceylon continues to be the best customer for Indian rice, but Germany, it will be noticed, has more than recovered its pre-war position, while Japan, with a much larger demand in 1922-23 than in the preceding year took less than half of her 1913-14 requirements. Direct trade with the West Indies developed considerably during the war. The demands of Cuba were previously met by re-exports of Rangoon rice, practically all *Straths quality*, from Liverpool or by German millers with similar or better qualities produced from cargo rice purchased in Burma. Direct shipments, chiefly from Calcutta, only in one year exceeded 2,500 tons. The exports from Burma to Cuba in 1915-16 amounted to 28,071 tons and in 1916-17 to 75,451 tons, the corresponding figures for Calcutta being 7,176 tons and 10,199 tons respectively. If more freight had been available the Calcutta figures in this and the following year would have been largely increased. In 1918-19, the strict rationing, established just before the new Burma crop came on the market, disappointed many prospective buyers. The Bengal rice, which goes to Cuba, is of a quality grown chiefly in the districts adjoining Calcutta for which there is little or no demand in India. In 1922-23 the total exports of rice to Cuba and other West Indian islands exceeded 110,000 tons, almost entirely from Bengal.

An export duty of three annas per maund (equivalent to about 1½d. a bushel) is levied on all foreign exports of rice husked or unhusked including rice flour but not meal, the tax

being included in the *f. o. b.* price. The total revenue from this source during the last ten years is shewn below.

TABLE NO. 60.—Revenue derived from export duty on rice since 1913-14.

Year.	Revenue.
	£
1913-14	860,000
1914-15	553,000
1915-16	507,000
1916-17	580,000
1917-18	702,000
1918-19	741,000
1919-20	245,000
1920-21	402,000
1921-22	536,000
1922-23	720,000

Early in 1918 the Government of India decided that no exports to Europe of Burma rice should be permitted except for the Royal Commission on Wheat Supplies and a Rice Commissioner for Burma was appointed. In November

of the same year, the monsoon rains having been disappointing, a Food Stuffs Commissioner for India was appointed and the Rice Commissioner placed under his orders. The main features of the control scheme were the determination by the Government of India of the quantities to be shipped to any particular destination, and the insistence upon licenses

before shipment, which were granted only upon production of satisfactory evidence that the price paid or to be paid was not in excess of the controlled basic price, which was in the first instance fixed at Rs. 335 ex-hopper for the quality known as "big mills specials." This price had to be raised in May 1919 as the control had threatened to break down owing to the rise in the price of paddy, and again in January 1920, when the control scheme was modified in certain other important particulars. In 1919-20 the other provinces of India absorbed no less than 80 per cent of Burma's exportable surplus, the principal foreign destinations being Ceylon, the Straits Settlements, the United Kingdom and Mauritius. Up to the end of 1920 control continued unchanged but the sudden break in the Indian demand led to a reconsideration of the allotments for other countries. In January 1921 all restrictions on the movement of rice coastwise were removed, while shipments to foreign destination were allowed freely under license. Power was, however, reserved to reimpose control, should prices rise unduly. A notable feature of the year was the reappearance of Germany as a buyer of Burma rice and but for difficulties of finance, despatches would have been even larger than they were. On the other hand, Java and Cuba, which had purchased heavily in the previous year, received very small allotments. There was an unexpected revival in the Indian demand in early part of 1921. Gambling upon the ultimate removal of control led the latter half of this year to a sensational advance in the price of paddy which the refusal of further licenses for foreign destinations in July failed to arrest. Shipments to Germany again increased, while there was a marked fall in the exports to the United Kingdom and Japan. Finally all control over exports of rice from Burma was removed in December 1921, and from India on 1st April 1922. The total net profit accruing from the Rice Control scheme amounted to over 9 crores of rupees (£6 millions) which have been placed at the disposal of the Government of Burma for the development of the province.

Since the British occupation in 1852, rice has been Burma's principal export and Rangoon rice, as it is called, is the standard of the European rice trade. About two-thirds of the rice crop comes from Lower Burma where it represents 90 per cent of the cultivated area. From threshing floor to river or railhead the paddy is commonly carted in bulk. It is thence conveyed to the various ports either by rail in bags or more commonly by boat in bulk, measured alongside the mills as discharged, and stored in the mills' *godowns*. Paddy prices in Rangoon are quoted with reference to a unit of 100 baskets containing 46 lbs. each, but in the districts the baskets used are not standardised and there is considerable local variance. For example, the Akyab paddy basket contains 23 lbs. only.

As a rule the paddy is taken over from the cultivator on the threshing floor either by middlemen acting on behalf of the mills, by speculators, or by local traders known as jungle brokers.

**Marketing.** The beginning of the paddy season corresponds pretty closely to that of the calendar year as harvesting commences generally towards the end of November and the crop comes commercially into sight in January. The crop is all hand-reaped chiefly by *coolies*



Rice for the United Kingdom is usually on consignment sale through brokers in London. The general level of prices for Burma rice is lower than for any other variety.

The qualities of white rice milled in Burma are known as follows :—

Nos. 1, 2 and 3 Europe rice.

S. Q. (Straits Quality) Europe rice.

Small Mills special.

Big Mills special.

Special grains have their own names, e.g., *Meedong* rice, *Yahine* rice, etc.

The following qualities of broken rice or *coodite* are produced from the above :—

*From all qualities* :—

Nos. 4, 5 and 6 white broken rice.

Cargo broken rice.

*From Nos. 1 and 2 Europe rice* :—

A 1, A 2 and A 3 white broken rice.

*From No. 3 Europe rice and S. Q. Europe rice* :—

B 1, B 2 and B 3 white broken rice.

*From Small Mills specials and Big Mills specials and Meedong specials* :—

C 1, C 2, and C 3 white broken rice.

The barometer of the Rangoon market is the price of big mills special rice which again depends upon and bears a definite relation to the current price of paddy.

The unit of shipment in Rangoon is the bag which varies in weight from 168 to 225 lbs. nett.

The usual busy season for paddy commences about the 15th of January and lasts till somewhere about the 15th of April. By the latter date it is normally reckoned that about half the exportable surplus has been marketed. The remainder of the crop is marketed throughout the year and under normal conditions is delivered at the port of export by the middle of December. There has been a growing tendency, of recent years, which war exigencies have accentuated, to store so as to distribute the business more evenly throughout the year. Co-operative Credit Societies have enabled cultivators to hold up part of the harvest instead of rushing it down in the first three months of the season and glutting the market with disastrous results to themselves.

The milling capacity of a typical Rangoon mill may be put at about 30,000 baskets of 46 lbs. paddy per day of 12 hours. The largest mill at Pazundaung is capable of turning out 700

Mills. tons of cargo rice a day. Mills generally run night and day for about three months in the year and paddy husk is the only fuel used. The quantity of husk produced is always in excess of fuel required and until a year or two ago the surplus husk used to be discharged into the creeks and rivers. Now-a-days, however, when fuel is expensive many other industries are glad to purchase the available surplus.

No exact figures are available as to the number of rice mills in Burma and their milling capacity, but there are over 300 employing twenty hands or more and on a conservative estimate the outturn may be put

at about 6,000,000 tons of ' five parts cargo rice ' per annum. In Burma, as in other parts of India, the capacity of mills is considerably in excess of the quantity of grain available for milling.

TABLE No. 61.—*The distribution of the exports of rice from Burma according to countries in 1913-14 and 1922-23 contrasted.*

1913-14.			1922-23.		
Destination.	Tons.	Per cent.	Destination.	Tons.	Per cent.
Ceylon . . . . .	44,723	2	Ceylon . . . . .	266,451	15
Straits Settlements . . . . .	280,922	15	Germany . . . . .	339,450	19
United Kingdom . . . . .	139,250	8	China and Hongkong . . . . .	271,996	16
Holland . . . . .	325,300	18	United Kingdom . . . . .	71,959	4
Germany . . . . .	297,560	16	Japan . . . . .	72,512	5
China and Hongkong . . . . .	20,429	1	Straits Settlements . . . . .	172,578	10
Austria-Hungary . . . . .	209,417	11	Mauritius and Dependencies . . . . .	24,966	1
Japan . . . . .	160,643	9	Other Countries . . . . .	525,821	30
Other countries . . . . .	356,701	20			

The normal distribution of the foreign trade before the war between the different Burma ports was—Rangoon 68 per cent, Bassein 13 per cent, Moulmein 10 per cent and Akyab 9 per cent. In 1922-23 the percentages were Rangoon 83 Bassein 10 Moulmein 6 and Akyab 1.

Though the average acreage under rice in Bengal and the adjoining province of Bihar and Orissa, which is chiefly served by the port of Calcutta,\* amounts to 47 per cent of the aggregate for British India, the volume of foreign exports has never been comparable with that of Burma, though in a favourable season the Madras figures are generally exceeded. The principal destinations for Bengal rice in pre-war years were Ceylon and Mauritius. Since 1913-14 Natal has taken an increasing share of the trade and a direct trade with Cuba has sprung up. Of the total, 99 per cent went in pre-war days from Calcutta and the balance from Chittagong. The following table gives the consolidated Bengal figures.

TABLE No. 62.—*Quantities and values of rice exported from Bengal.*

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	326,921	3,304,148
1914-15 . . . . .	170,244	1,770,276
1915-16 . . . . .	75,450	841,759
1916-17 . . . . .	64,107	742,600
1917-18 . . . . .	71,404	713,342
1918-19 . . . . .	153,326	1,626,675
1919-20 . . . . .	48,978	720,330
1920-21 . . . . .	10,502	207,193
1921-22 . . . . .	11,711	217,171
1922-23 . . . . .	207,319	2,785,802

\* In 1913-14 and earlier years there were also some shipments from Cuttack.

Shipments in 1915-16, 1916-17 and 1917-18 were affected by freight shortage, and in 1918-19, when a better shipping position and a brisk demand for common rice from Ceylon, South Africa, Mauritius and the West Indies encouraged heavier exports, it became necessary to conserve supplies for local consumption in consequence of the partial failure of the monsoon. The Foodstuffs Commissioner, whose appointment became necessary in October 1918, decided that these markets should be rationed as far as possible from Burma.

The chief varieties of Bengal rice on the market are *table or white Patna*, *broken table rice or khoud*, *Patna, old hard* and *chinisukur*, while among boiled or brown rices may be mentioned *boiled Patna*, *dowd-khans*, *ballam* and *raree*. The principal variety of rice exported is *kazla* which goes to Ceylon. The chief market for white *Patna* before the war was Hamburg, but considerable quantities went also to Liverpool and Bremen; for *old hard*, which is grown chiefly in the neighbourhood of Calcutta (the designation *Patna* having reference to the boldness of the grain and not implying locality of origin), Cuban ports; and for *boiled Patna* and *ballam* Trinidad, Martinique and the Persian Gulf. For *raree* there is a considerable demand in Mauritius.

The unit of sale in Calcutta is the bazaar maund and shipment is made in bags of 164 or 224 lbs. nett, while sterling quotations are based on the cwt. c. i. f.

Foreign exports from the Madras Presidency are comparatively limited. The following table shows the quantities exported during the last ten years:—

TABLE NO. 63.—Quantities and values of rice exported from all ports in the Madras Presidency during the last ten years.

Year.	Quantity.		Value.
	Tons.	£	
1913-14 . . . . .	155,000		1,570,000
1914-15 . . . . .	183,000		1,850,000
1915-16 . . . . .	239,000		2,627,000
1916-17 . . . . .	184,000		2,077,000
1917-18 . . . . .	173,000		1,965,000
1918-19 . . . . .	97,000		1,126,000
1919-20 . . . . .	2,000		25,000
1920-21 . . . . .	6,000		78,000
1921-22 . . . . .	53,000		705,000
1922-23 . . . . .	51,000		673,000

Practically the whole of the trade is with Ceylon. The chief ports of export were Cocanada, Tuticorin, Negapatam and Dhanushkodi. At Cocanada the usual grades shipped, all parboiled, are *mill rice A, B and C grades*, *chabyam* or unpolished rice and *bazaar boiled*, which is prepared in local hand mills and is of very inferior quality.

The unit of sale and of shipment is the bag of 164 lbs. nett, generally.

Foreign exports of rice from Bombay are on an even smaller scale than those of Madras. In pre-war years, the average shipments did not exceed 26,000 tons a year, the actual

Bombay Presidency. figures for 1913-14 being 28,884 tons. The table below gives the quantities and values of rice exported from 1913-14 onwards.

TABLE NO. 64.—Quantities and values of rice exported from Bombay from 1913-14 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14	28,884	283,545
1914-15	25,276	256,024
1915-16	30,859	322,098
1916-17	72,657	797,509
1917-18	113,404	1,296,425
1918-19	104,635	1,520,504
1919-20	49,671	631,909
1920-21	27,839	481,631
1921-22	2,377	39,079
1922-23	22,538	354,214

The considerable increase in the figure in the triennium 1916-17 to 1918-19, was in consequence of larger shipments to the Persian Gulf and East Africa, chiefly of rice railed across India, because there was no freight offering in Calcutta or Rangoon direct to these destinations. The total for 1922-23 represents a return to pre-war levels.

The unit of sale and of shipment is the bag of 168 lbs. gross.

The following table shews the quantities and values of rice exported from Karachi to foreign countries from 1913-14 onwards.

(2) Karachi.

TABLE NO. 65.—Quantities and values of rice exported from Karachi to foreign countries from 1913-14 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14	53,739	489,004
1914-15	41,345	402,652
1915-16	49,399	469,390
1916-17	77,363	759,487
1917-18	82,742	822,735
1918-19	51,817	729,507
1919-20	26,427	435,362
1920-21	81,841	1,254,472
1921-22	84,934	1,302,251
1922-23	48,009	675,187

There is comparatively little rice grown in the hinterland served by Karachi and the average value of shipments did not exceed £300,000 before 1913-14, when a good harvest in Cutch stimulated foreign exports, the chief customers being Ceylon, Aden, Mauritius, Red Sea ports, Muscat and Persia. Subsequent developments were due to the same causes as have been specified in the case of Bombay, but the embargo imposed in September 1918 on shipments of rice from Burma ports to Calcutta affected despatches in the latter half of 1918-19 and in the following year.

The unit of sale in the Karachi market is the candy of 656 lbs. and shipment is made in bags of 2 or 2½ maunds nett.

In the official Indian trade returns rice meal or bran is merged in the general heading 'Bran and Pollards.' The total quantity exported under this item in 1914-15 was 194,588 tons, of which 183,697 tons were shipped from Burma and the Burma exports are known to consist entirely of rice meal. As before the war, the United Kingdom is the principal customer for Burma rice meal as cattle fodder, taking about 120,000 tons each year with the Straits Settlements and Germany next in importance. The average price was Rs. 69 (£4 12s.) per ton in 1921-22, as compared with Rs. 13 (17s. 4d.) in 1917-18 and Rs. 8 (10s. 8d.) in 1918-19. The bulk of the shipments goes from Rangoon.

#### Wheat.

Though India produces about one-tenth of the world's wheat, this grain is an indispensable article of food to the inhabitants of the Punjab only. In other provinces extension of cultivation has been dictated rather by the prospects of profitable export to Europe than by internal demand. The five principal countries exporting wheat in pre-war times were the United States of America, Russia, Canada, the Argentine Republic and India in that order, while as regards production, India occupied the third place as the table below shews, with about a third of the American crop and nearly double that of Canada.

TABLE No. 66.—*Production and exports of wheat according to countries in 1914.*

Countries.	Production.	Exports.	Percentage of exports to production.
	Tons.	Tons.	
United States of America . . . . .	23,816,885	4,647,300	20
Russia . . . . .	15,324,047	2,368,500	16
India . . . . .	8,336,484	694,680	8
Argentine Republic . . . . .	4,498,215	963,000	21
Canada . . . . .	4,311,015	1,879,200	44
Total . . . . .	56,286,646	10,552,680	19

The variety of wheat most commonly cultivated in India is *triticum vulgare*. The larger part of the Punjab crop is under irrigation, particularly in the new canal colonies. Little or no labour saving machinery is yet employed in the wheat fields and the crop is hand-reaped. On land liberally manured and irrigated, yields of from 1,500 to 1,600 lbs. per acre have been obtained but the crop is liable to damage by rust if there is rain or cloudy weather in February. On dry (i.e. un-irrigated) lands 800 lbs. would be a fair average crop.

Harvesting of the crop begins in March and April and winnowing continues until the end of May. In a good year the surplus crop is at once brought up by exporters and no time is lost in putting it on the European market where it bridges the interval between the antipodean harvests of South America and Australia and those of northern latitudes. Good prices are often procurable for early shipments as they arrive at a time when home stocks are practically exhausted. The rush of wheat from the threshing floor to the ports is therefore concentrated in normal years to May, June, July and August and shipments thereafter, except when a good monsoon coincides with a brisk European demand, are comparatively small. The divergences noticeable between 1919 and 1922 in the subjoined table are due chiefly to control.\*

TABLE No. 67.—*Monthly exports of wheat in 1914 and during the last six years from Karachi.*

Months.	1914.	1918.	1919.	1920.	1921.	1922.	1923.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
January . . .	18,670	12,446	1,240	640	79,827	394	68,446
February . . .	8,994	1,942	543	691	52,499	38	29,076
March . . . .	8,479	59,677	499	661	54,436	111	20,642
April . . . . .	7,016	43,109	56	371	18,364	94	56,760
May . . . . .	21,771	68,849	597	688	12,131	145	89,016
June . . . . .	166,997	75,840	823	516	13,824	150	186,168
July . . . . .	166,447	55,588	455	610	23,734	56	131,510
August . . . .	41,824	122,050	436	389	8,001	82	44,001
September . .	55,967	39,793	801	400	150	57	36,447
October . . . .	87,742	10,465	292	629	474	848	11,699
November . . .	54,615	985	157	8,958	399	45,951	29,141
December . . .	36,494	461	695	35,722	142	67,991	15,467

In years of plenty the cultivators in the Punjab are generally anxious to realise their money in order that they may pay off advances, satisfy Government dues and avoid the risk of loss from weevils by storage in the monsoon. In years of famine the local price is generally so high that the parity of prices in Europe is exceeded and the volume of exports falls to a very low figure. In a good season the percentage of exports to output may be 10; in a year of scarcity, such as 1908-09, the percentage may fall below 2.

In the five years ending 1912-13, the area under wheat in India averaged 27 million acres with an annual output in the neighbourhood of 8 million tons. The wheat exports of

**Acresage.** the statistical year are mainly drawn from the crop of the previous year, and in the table which follows this is recognised, as the export figures indicated against each year in the table stand for quantities that actually went forward only in the following year. Though the area under wheat increased by over 2½ million acres in 1922-23, the estimated increase in yield showed scarcely any advance on that for 1921-22.

\*Vide page 157 *infra*.

TABLE No. 68.—*Area, yield and exports of wheat in India in the last quinquennium.*

Year.	Area.	Yield.	Exports.
	Acres.	Tons.	Tons.
1918-19 . . . . .	23,798,000	7,507,000	8,643
1919-20 . . . . .	29,949,000	10,122,000	237,665
1920-21 . . . . .	25,784,000	6,706,000	80,809
1921-22 . . . . .	28,207,000	9,830,000	220,194
1922-23 . . . . .	30,844,000	9,888,000	638,300

The estimated area and yield in 1923-24 were 30,725,000 acres. and 10,055,000 tons.

India's participation in the world's wheat market dates from 1870, when the opening of the Suez Canal brought the wheat fields of the United Provinces within thirty days of Europe.

**Marketing.**

In the early days of the trade the wheat grown in those provinces was railed down to Calcutta for shipment until the extension of the railway system enabled Bombay to compete, and then with the expansion of irrigation in the Punjab the trend of exports has gradually drifted north-westward and Karachi where, it is claimed, the cost of handling and storage is lower than at Calcutta or Bombay, has now assumed a commanding position. Wheat is bought at centres upcountry, such as Lyallpur, and bagged and railed down to Karachi where it is sold by the candy of 656 lbs. including bags, manipulated and stored before shipment chiefly to the United Kingdom. Shipment is usually made in bags of 2 cwts. nett. In Bombay sales are made per candy of 756 lbs. and wheat is shipped in bags varying in weight from 182 to 224 lbs. nett. Quotations to the United Kingdom are generally per quarter of 492 lbs. nett. Typical descriptions on the Karachi market are—*white*, including 5 per cent barley, 3 per cent dirt, 30 per cent red; *red*, including 5 per cent barley and 3 per cent dirt, and superior grades, *white* and *red* with admixtures in each case of 2 per cent barley and 1½ per cent dirt only. Though the chief varieties of wheat exported from India fall within the definition of *soft* wheat commercially, there are *hard* wheats (red and yellow) grown in Central India which find a market in Marseilles and Italy, where they are used in the manufacture of macaroni. In the general absence of wheat elevators, Karachi, with a rainfall that seldom exceeds five inches, has great advantages over Bombay, where the monsoon rains are heavy and the general humidity throughout the year much higher. The wheat awaiting shipment in Karachi can be stored at the docks in open sheds with very little risk of damage by rain.

Indian wheat at one time had the reputation of being dirty, but it was established that this was not due so much to careless threshing or handling as to deliberate adulteration to conform to the practice of the English grain trade. Since 1907 there has been a marked improvement in the quality of Indian wheat owing to the new contract of the London Corn Trade Association being on the basis of an admixture not exceeding 2 per cent of other food grains (in practice chiefly barley) but free from dirt. A specimen of the contract at present in force will be found in Appendix VII.

The distribution of the exports of wheat, among the three principal ports interested, are shewn in the next table. No less than 99 per cent of the shipments in 1922-23 went for Karachi, Bombay's participation in this trade having steadily declined since the war.

TABLE No. 69.—Exports of wheat in 1913-14 and from 1918-19 onwards.

Principal ports.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	
Karachi . . . . .	898,324	410,127	5,505	234,945	77,702	218,488	
Bombay . . . . .	285,840	39,613	2,473	2,037	1,513	840	
Calcutta . . . . .	73,191	25,362	665	683	1,534	804	
TOTAL	QUANTITIES . . . . .	1,202,205	476,103	8,643	237,665	80,809	220,194
	VALUES £ . . . . .	8,755,671	4,502,082	135,773	2,733,546	978,850	2,293,475

The principal recipient for Indian wheat has always been the United Kingdom. In 1922-23 87 per cent of the total shipments went to that destination, and 5 per cent to Belgium.

Wheat prices are always expressed in India by the number of *seers* (of 2.05 lbs.) sold for a rupee and the higher the figure the cheaper the wheat.

There was a general rise of wheat prices all over the world as soon as war was declared and Indian bazaar prices moved up in sympathy. In October 1914 the Government of India by ordinance gave authority to Local Governments to inquire into stocks and take over if necessary any unreasonably withheld. As this did not stay the upper trend of prices, it was decided to restrict the export of wheat and wheat flour from December 1914 to March 1915 to 100,000 tons. Prices nevertheless continued to soar and in February 1915 were 45 per cent above the level of the previous July. The promise of an excellent harvest then steadied the market and the measure of increase was reduced to 21 per cent by the end of March.

In April 1915 the Government decided to prohibit all private exports of wheat so as to remove the link between the Indian and the world market, and created a special appointment of Wheat Commissioner to secure the most advantageous terms for the exportable surplus. While this control was in force the firms which had previously been engaged in the shipment of wheat to Europe were appointed buying agents for the Wheat Commissioner at a fixed commission, the maximum prices to be offered to sellers up-country being fixed by Government from time to time and gradually reduced so as to discourage speculative hoarding. The total quantity purchased on Government account between April 1915 and May 1916, when the arrangements were altered, exceeded 525,000 tons, of which 458,057 tons were shipped from Karachi, 40,870 from Bombay and 29,606 from Calcutta.

With effect from the 1st May 1916 shipment on private account was once more permitted up to the limit of quarterly allotments fixed by the Wheat Commissioner on the basis of pre-war business but this arrangement only continued until the end of October when the Royal Commission on wheat supplies assumed control and made direct purchases until February 1917 and then the Wheat Commissioner was again invested with entire responsibility for buying operations. The wheat harvest of 1917 beat all previous records and in 1917-18 no less than 1,454,400 tons were exported, exclusive of 25,600 tons shipped on military account. The Wheat Commissioner on behalf of the Royal Commission purchased 1,578,346 tons in 1917-18. Though purchases on behalf of the Royal Commission were terminated in October 1918, 384,545 tons were exported on this account in the following year of which 331,464 tons were shipped from Karachi, 229,304 tons were of Punjab wheat and 125,978 tons of wheat from the United Provinces.

The widespread failure of the rains in 1918-19, though it affected the wheat harvest of the Punjab but little, caused a general rise in the price of all food grains in Northern India and to meet the situation the Government of India arranged to take over some of the large stocks of Australian wheat which the Royal Commission had purchased some time ago, but for which no freight could be found. During the four months March to June 1919 arrivals of Australian wheat at Indian ports aggregated 168,000 tons. The quantity of wheat exported in 1919-20 was the lowest on record owing to the embargo on exports imposed by the Foodstuffs Commissioner. The harvest of 1919 was also the poorest of recent years, but that of 1920 being above the average the Government of India released 400,000 tons for export between October 1920 and March 1921, but the total actually shipped from Karachi, before the close of the official year was only 229,000 tons. In 1921-22 the failure of the monsoon of 1920 affected the wheat harvest of the following year and exports fell to 80,000 tons while imports of wheat from Australia and the United States of America amounted to 440,000 tons. The Indian wheat crop for 1921-22 was estimated at 9,800,000 tons as compared with 6,700,000 tons in the previous year and in September all restrictions on exports were removed. The total quantity exported by the close of the year was 220,000 tons only as compared with 1,200,000 tons in 1913-14, but it must be remembered that in normal times the heaviest months for shipment are May, June and July when the embargo was still in force.

The exports of wheat flour correspond pretty closely, when uncontrolled, to those of wheat. The products of the mills are known by

the vernacular names *maida*, *atta* and *suji* which are statistically shown under the common head of wheat flour. These names represent three grades of flour in order of fineness. *Suji* is the round, granular meal of inferior quality obtained by grinding wheat which has been moistened overnight and then passing it through a sieve, the bran mixed up with it being later on separated by winnowing. It is used chiefly for making a sort of coarse porridge and as a constituent in certain bazaar sweetmeats. The other

two qualities are obtained by regrinding *sujji* and passing it through a second sieve, the finer flour resulting being called *maida*, and the coarser *atta*. While the former is the luxury of the richer classes, the latter baked into coarse cakes called *chappattis* comprises the main food of the poor in many parts of India. The chief destinations for wheat flour before the war were Egypt, Asiatic Turkey, Mauritius, Aden, Ceylon, the Straits Settlements and the United Kingdom, the variety generally shipped being *atta*. Egypt, Arabia, Ceylon, and Mauritius are now the principal participants.

TABLE No. 70.—Exports of wheat flour (quantities and values) from 1913-14.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	79,412	884,068
1914-15 . . . . .	53,985	611,922
1915-16 . . . . .	58,608	746,812
1916-17 . . . . .	70,156	865,287
1917-18 . . . . .	71,568	1,006,249
1918-19 . . . . .	30,942	543,021
1919-20 . . . . .	48,209	986,732
1920-21 . . . . .	60,769	1,146,324
1921-22 . . . . .	64,420	1,246,789
1922-23 . . . . .	50,055	887,417

The principal ports concerned in export are Karachi, Bombay and Calcutta in that order. The unit of sale and shipment in Karachi is the bag of 164 or 196 lbs., the latter being the unit commonly accepted in Bombay. In Calcutta sales are made on the basis of the bazaar maund and the flour is shipped in bags of 164 or 224 lbs. nett.

### Barley.

Barley (*hordeum vulgare*) is chiefly grown in the United Provinces and Bihar. The total area under the crop in British India in 1917-18 was 7 million acres in addition to about four hundred thousand acres in Indian States, chiefly Jaipur, Alwar, Bharatpur and Gwalior. Of the four million acres in the United Provinces the greater part is in the Gorakhpur, Benares, Lucknow and Allahabad divisions. Barley is a *rabi* crop sown in October or November and reaped in March or April. Arrivals in the upcountry markets begin in April and business is brisk till July.

There is such a large internal demand that the volume of exports has never attained any considerable dimensions and Indian barley plays a very humble part in the world market for the grain, though the volume of Indian exports responds at once to any shortage of supplies in the United Kingdom. In 1912-13 as much as 615,177 tons were exported of which 82,372 tons went from Bombay, 154,420 tons from Calcutta, and 377,874 tons from

Karachi. The imports of barley in the same year were 720 tons chiefly into Karachi. The large shipments of 1918-19 were chiefly to Egypt 'for orders.' The negligible exports in the next three years are attributable to control, which was in force from January 1919 until September 1922.

TABLE NO. 71.—Quantity and value of barley exported in 1913-14 and during the last five years with the share of the different ports.

Ports.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Karachi . . .	127,622	215,305	1,338	1,585	4,568	14,008
Calcutta . . .	54,249	43	121	107	109	138
Bombay . . .	8,519	11,000	196	4,368	5,201	1,475
Bangoon . . .	10	4	1	..	..	..
Total { QUANTITY	190,400	226,352	1,656	6,060	9,878	16,621
{ VALUE £	1,043,769	1,845,111	17,994	91,347	135,749	127,528

Two-thirds of the exports go to the United Kingdom. The bulk of the remainder goes to Arabia and Persia.

The unit of sale in Bombay is the candy of 27 Bombay maunds and in Calcutta the bazaar maund. The wholesale price is generally quoted in Karachi at so much per candy of 656 lbs.

Unit of sale and ship-  
ment. \* and the usual allowance for refraction is 3 per cent. Shipment is made in bags, the weights, varying at each port—164 or 184 lbs. in Karachi, 123 or 186 lbs. nett in Calcutta and 168 lbs. in Bombay. Quotations for export to the United Kingdom are generally per quarter of 400 lbs. gross.

### Pulses.

Under the same statistical heading are grouped a great many food grains, the most important being *arhar*, lentils, *dhal*, beans and peas, the three last of which are distinguished by

Trade varieties. the great number of varieties which are marketed. For gram,\* which is also a pulse, separate figures are maintained. The lentil or *masur* (*lens esculenta*) is a valuable pulse grown as winter crop all over India, especially in the Central Provinces, Madras and the United Provinces. Flavoured with aromatics and condiments it largely disappears in internal consumption. *Arhar* (*cajanus indicus*) or pigeonpea is generally grown in India as a mixed crop particularly in rotation with cereals. As it enters largely into the vegetarian diet of high caste Hindus, its economic value is great though the volume of exports is negligible. *Dhal* is a common term applied to the split grain of a large variety of pulses, the most common being *pisum sativum* and *phaseolus mungo*. Peas and beans are also of many types, e.g., Rangoon or white beans, French beans, kidney beans, white and green peas.

\* See page 162 *infra*.

The Burma white bean (*phaseolus lunatus*) is locally known as *pebugale*, the trade in which is large and important. The harvesting of white beans begins in February or March but those grown on the islands formed when the river falls are not gathered till April or May and these are of superior quality. They are shipped as bought from the cultivator, and were formerly utilized chiefly as feeding stuff for cattle. During the war an enhanced demand arose for Burma beans to take the place of the haricot beans so largely grown in the Danubian provinces from which the Allies were temporarily cut off, and large quantities were purchased by the Belgian Relief Commission and shipped to Europe. In 1919-20 the high prices of the previous year encouraged an extension of cultivation and the exports to foreign destinations totalled 109,000 tons chiefly to the United Kingdom, Netherlands and Belgium. The features of recent years have been greatly reduced exports to the Continent and steady shipments to Japan, where bean cake is popular as a cattle feed, and to Madras.

No separate statistics of acreage or production of any of these pulses are maintained, but the aggregate outturn must be very considerable as every bazaar in India contains one or more varieties. The extent of the export trade in pulses is illustrated in the following table.

All the five principal ports participate. The main recipients are the United Kingdom, Ceylon, Mauritius, and Japan though in pre-war days large quantities found their way into Germany, Holland and Belgium. An improved demand for white beans from Burma is evidenced by the fact that Rangoon accounted for 75,000 and 77,000 tons respectively, out of the totals for 1916-17 and 1917-18, against an average for the three preceding years of 30,000 tons.

TABLE No. 72.—Quantity and value of pulses (excluding gram) exported from India from 1913-14.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	114,628	711,009
1914-15 . . . . .	88,115	676,143
1915-16 . . . . .	110,035	972,159
1916-17 . . . . .	187,939	1,750,303
1917-18 . . . . .	229,724	2,438,578
1918-19 . . . . .	159,318	1,970,732
1919-20 . . . . .	135,332	1,690,953
1920-21 . . . . .	54,195	616,641
1921-22 . . . . .	75,422	824,810
1922-23 . . . . .	125,449	1,132,274

The unit of sale and of shipment varies for these pulses in all the ports. In Calcutta sales are made on the bazaar maund, in Karachi on the candy of 656 lbs. and in Bombay on the candy of 28 Bombay maunds. Quotations for shipments to the United Kingdom are generally based on the quarter of 504 lbs. gross. Shipment is made from Calcutta in

bags of 164, 210 or 224 lbs. nett while Karachi adopts bags of 164 lbs. and 206 lbs. nett. Bombay ships in bags of 168 lbs. nett. For Burma beans the customary unit of sale is a hundred baskets of 69 lbs. each and shipment takes place in bags of 180 to 280 lbs. nett.

#### Millets.

A number of important food crops grown in India falls, within the category of millets, the most important being *jowar* (*sorghum vulgare*) the great millet, yielding an excellent grain which is the staple food of the agricultural population of the Madras and Bombay Deccan and the adjoining districts of Hyderabad. There are considerable areas under the crop in the Central Provinces and United Provinces and to a smaller extent also in Burma. The harvested straw constitutes a popular fodder crop for cattle, but the plants, if grazed or cut when immature, are sometimes poisonous in their effects. A smaller variety known as *bajra*, the bulrush or spiked millet (*pennisetum typhoides*) is scarcely less widely cultivated. Neither of these millets is at any time extensively exported. The following table shows the exports of jowar and bajra during the last ten years.

TABLE No. 73.—Quantity and value of jowar and bajra exported from India from 1913-14 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	84,294	576,164
1914-15 . . . . .	105,206	743,441
1915-16 . . . . .	41,845	288,102
1916-17 . . . . .	36,301	261,217
1917-18 . . . . .	15,322	120,800
1918-19 . . . . .	5,398	56,182
1919-20 . . . . .	7,715	112,972
1920-21 . . . . .	13,129	155,226
1921-22 . . . . .	4,879	51,563
1922-23 . . . . .	15,690	151,024

The principal ports from which shipments are made are Bombay, Karachi and Rangoon and the principal destinations are Aden, Egypt and the United Kingdom among British and Asiatic Turkey, Arabia and Italian East Africa among foreign countries. Restricted shipments to the first-named destination owing to the general control of food stuffs accounts for the drop in the export figures for 1918-19 and subsequent years. 30 per cent of the despatches in 1922-23 were to the United Kingdom.

The unit of sale in Karachi is the candy of 656 lbs. and of shipment, the bag of 164 and 206 lbs. nett. Sales are made in Bombay on the basis of a candy of 27 Bombay maunds, but the unit of shipment varies for jowar and bajra, the former being shipped in bags of 154 to 168 lbs. nett and the latter in bags weighing 168 to 180 lbs. gross. The unit of sale in Rangoon is a 100 baskets of 62 lbs. each.

### Gram.

Gram (*cicer arietinum*) is probably the most important of the pulses grown in India, being sown over an area of about 13,000,000 acres of

which the United Provinces account usually for about half, but the crop is important also in Bengal, Bombay, and the Central Provinces, but not in Southern India. The new crop comes on the market generally in April, and the bulk of the business is put through before the rains. It should be carefully distinguished from the horse-gram (*dolichus biflorus*) grown so largely in Southern India as a substitute for oats.

As in the case of other pulses gram enters so largely into local consumption wherever it is grown that exports even in years of plenty are comparatively limited.

#### Exports.

TABLE NO. 74.—Quantity and value of exports of gram from 1913-14.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	69,597	415,104
1914-15 . . . . .	23,298	166,195
1915-16 . . . . .	32,494	224,590
1916-17 . . . . .	38,223	275,465
1917-18 . . . . .	327,063	2,328,537
1918-19 . . . . .	282,183	2,233,414
1919-20 . . . . .	5,190	72,559
1920-21 . . . . .	5,733	76,948
1921-22 . . . . .	4,938	71,883
1922-23 . . . . .	21,957	214,371

The ports participating in the trade are Karachi, Calcutta, Bombay and Rangoon, and the principal destinations are the United Kingdom, Ceylon, the Straits and Mauritius among British, and France among foreign countries. Before the war Germany absorbed fairly large quantities. The phenomenal increase in 1917-18 and 1918-19 is to be accounted for by enhanced shipments to Egypt on Government account 'for orders' and also to Italy. Exports were controlled from January 1919 until September 1922 and the figures for 1922-23 shew a considerable recovery, though still much below pre-war levels.

The unit of sale is the same as for barley,\* but shipment is made from Calcutta in bags of 164 or 218 lbs., from Karachi in bags of 2 cwts.

Unit of sale and shipment. net and from Bombay in bags of 168 to 180 lbs. gross. Gram is sold in Rangoon per 100 baskets of 65 lbs. each and shipped in bags weighing 180 to 280 lbs. nett. Quotations to the United Kingdom are generally per quarter of 504 lbs. gross.

### Maize.

Garden plots or patches of maize or Indian corn (*zea mays*) may be found practically all over India, but extensive cultivation is confined to the United Provinces, Bihar and Orissa, the Punjab, Bombay and the Central Provinces.

#### Area.

\* See page 159 *supra*.

The total area under the crop averages about 6,400,000 acres with an estimated annual production of 2,200,000 tons. The new crop begins to appear in up-country markets towards the end of October and trading is brisk from November to March.

The greater part of the crop is locally consumed and the exports, at no time important, had, owing probably to larger Argentine harvests, become almost negligible when war broke out.

TABLE NO. 75.—Quantity and value of maize exported from 1913-14 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	2,881	13,966
1914-15 . . . . .	1,429	8,191
1915-16 . . . . .	4,066	14,332
1916-17 . . . . .	24,877	163,083
1917-18 . . . . .	91,014	631,489
1918-19 . . . . .	13,761	104,832
1919-20 . . . . .	329	6,828
1920-21 . . . . .	3,762	27,081
1921-22 . . . . .	1,744	10,472
1922-23 . . . . .	22,488	151,816

It was only in 1916-17 with the Argentine supplies practically cut off from Europe by difficulties of tonnage and the submarine menace in the South Atlantic, that there was temporarily a great expansion of business. In 1917-18, with these conditions persisting, the total shipments were thirty times the pre-war normal, chiefly to the United Kingdom, Egypt for orders and Greece. In 1918-19 a general shortage of foodstuffs was apprehended in India, owing to the failure of the south-west monsoon, and for the next three years export was controlled. Exports are chiefly from Karachi, Rangoon and Calcutta. The United Kingdom absorbed about 60 per cent of the considerable quantity shipped in 1922-23. Japan was in former years a constant customer though she took nothing during the war.

The unit of sale in Calcutta is the bazaar maund and maize is shipped in bags of 2 maunds nett. In Rangoon the unit of sale is a hundred baskets of 55 lbs. each and that of shipment, bags of 180 to 280 lbs. nett. In Karachi sales are based on the candy of 656 lbs. and shipment is effected in bags weighing 206 lbs. nett. Quotations for export to the United Kingdom are generally based on the quarter of 480 lbs. gross.

#### Oats.

The cultivation of oats (*avena sativa*) for the grain is confined mainly to the Delhi and Hissar districts of the Punjab and the Meerut district of the United Provinces where it is grown as a *rabi* crop, but it is raised also to a limited extent

Cultivation.

in the Poona, Ahmednagar, Satara and Ahmedabad districts of the Bombay Presidency. Elsewhere it is more frequently cut green for cattle fodder. No separate statistics of area or production are maintained and the foreign export trade is normally insignificant in comparison with that of other grains produced in the country, as the following table indicates.

TABLE No. 76.—Quantity and value of oats exported from 1913-14 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	469	3,391
1914-15 . . . . .	670	5,580
1915-16 . . . . .	2,664	24,548
1916-17 . . . . .	791	8,240
1917-18 . . . . .	700	6,575
1918-19 . . . . .	431	5,409
1919-20 . . . . .	824	12,675
1920-21 . . . . .	1,226	15,037
1921-22 . . . . .	515	6,757
1922-23 . . . . .	929	11,486

Very nearly 60 per cent of the exports go from Calcutta and the balance from Bombay. The chief recipients in pre-war days were Mauritius and Ceylon, but in 1915-16 nearly 1,500 tons found their way to Australia, a market which did not receive any shipments in the previous quinquennium.

The unit of sale in Calcutta is the bazaar maund and shipment is made in bags weighing 2 maunds. In Bombay sales are made on the candy of 28 Bombay maunds and shipment is effected in bags weighing 1½ to 1¾ cwts. nett.

### OIL SEEDS.

The importance and value of the trade of India in oilseeds has only recently been generally recognised. The annual production of seeds is estimated at over 5,000,000 tons with an

aggregate value of over £50,000,000, and if exports in general. 1913-14 be taken as an average year, the exports were equivalent in quantity and value to one-third of the total. If the exports of the residual cake and oil are added, viz., 3,250,000 gallons of oil and 175,000 tons of cake, the aggregate of India's annual trade under this head amounted ten years ago to £18,000,000, and in 1922-23 with a reduced volume of trade to about £19,500,000.

The following tabulated statement will give some idea of the actual percentages of the world's demands for seeds that used to be met from Indian sources.

Seeds.

TABLE NO. 77.—Share of India in the world's trade in oilseeds in 1913-14.

Seeds.	Total exports from producing countries.	Exports from India.	Percentage.
	Tons.	Tons.	
Linseed . . . . .	1,808,000	414,000	23
Groundnut . . . . .	779,000	364,000*	46
Cotton seed . . . . .	868,000	284,000	33
Rape and Mustard seed . . . . .	985,000	254,000	26
Castor seed . . . . .	135,000	135,000	100
Sesame seed . . . . .	264,000	112,000	42
Copra . . . . .	537,000	38,000	7
Mowra seed . . . . .	33,000	33,000	100
Poppy seed . . . . .	25,000	19,000	76
Nigerseed . . . . .	4,000	4,000	100

\* Including exports from Pondicherry.

About one-third by weight of the total exports was absorbed by the United Kingdom, but only a fifth in point of value as the principal items were the relatively cheap seeds, linseed (157,300 tons), cotton seed (279,200 tons), and castor seed (55,000 tons) out of a total of 508,270 tons.

**Pre-war distribution of trade.** France and Germany, on the other hand, which claimed no more than a fourth and an eighth respectively of the total exports, accounted for one-third and one-sixth of the aggregate value of the trade. France's total of 455,250 tons was made up mainly of groundnut (222,400 tons) and linseed (115,500 tons), the only other considerable item being rapeseed (53,900 tons). The disproportion between weight and value in Germany's figures was likewise due, as in the case of France, to the preponderant share taken of the more valuable seeds and in particular of copra (24,000 tons) and mowra (28,400 tons) though her appropriations of linseed (48,300 tons) and rape (58,200 tons) were also considerable. Apart from these three main consumers, Belgium took 98,900 tons of rapeseed and 38,500 tons of linseed, while Italy imported chiefly linseed (30,700 tons) and sesame (14,300 tons) and Austria-Hungary, sesame (19,300 tons) and groundnut (10,700 tons).

The bulk of the oilseeds for the United Kingdom are sold under the terms of the contracts framed by the Incorporated Oilseeds Association on a pure basis. A specimen of this Association's linseed contract will be found in Appendix VIII.

**Contracts for the United Kingdom.** Of very much smaller importance are the exports of oil from India, value of which in 1913-14 was rather less than £400,000 and in 1922-23 to £350,000 only. The United Kingdom was the best all-round customer, but 50 per cent of the exports of castor oil went to Australia and New Zealand and 44 per cent of the exports of coconut oil to the United States of America.

A great quantity of oil is of course required for internal consumption. Though most of the vegetable oils manufactured are extracted by crude processes in mills worked by bullocks or in hand presses, yet the number of well-equipped modern mills for oil crushing is on the increase, and the quality of the linseed oil exported from India in 1918-19 was higher than of any imported into India from the United Kingdom and commands a higher price. In the dry zone of Burma, where there has been a great expansion in recent years of groundnut cultivation, the development of the crushing industry on up-to-date lines has been taken up chiefly by European agency.

TABLE NO. 78.—Exports of oils from India in 1913-14 and 1922-23 contrasted.

Oils.	1913-14.		1922-23.	
	Quantity.	Value.	Quantity.	Value.
	Gallons.	£	Gallons.	£
Coconut oil . . . . .	1,091,477	155,073	834,243	134,733
Castor oil . . . . .	1,007,001	92,504	602,877	97,491
Mustard and Rape oils . . . . .	407,178	48,624	426,675	80,094
Groundnut oil . . . . .	288,190	30,013	52,876	8,487
Sesame oil . . . . .	208,053	28,699	92,890	15,606
Linseed oil . . . . .	102,360	17,493	30,728	7,203
Cotton seed oil . . . . .	2,507	347	8	2
Other vegetable oils . . . . .	135,321	12,900	13,580	2,653

There has been, it will be noticed, a decrease in volume under all heads except one, but a considerable increase in values.

The value of India's trade in oil-cakes was at the outbreak of war in the neighbourhood of £1 million sterling annually, the chief recipients being the United Kingdom, Ceylon and Japan which together accounted for six-sevenths of the whole. In 1922-23 the value of linseed cake shipped amounted to £112,000, of groundnut cake to £451,000, and of rape and sesame cake to £473,000, the principal recipients being unchanged.

**Oil-cakes.**

**Linseed.**

The feature of the cultivation of *linum usitatissimum* in India is that it is cultivated entirely for its seed and not for its fibre. Practically all the seed and the resultant oil and cake used to be exported but there has been a considerable change in this respect since 1914, and foreign markets are now more of a convenience and less of a necessity than they used to be. The plant is identical with the flax of Europe, but having long been cultivated for its seed only, is sown much more sparsely than on the Continent and has developed a branching habit of growth which would render it useless, or, at any rate, greatly lessen its value as fibre. When sown experimentally for flax in India special seed has always been procured from Europe.

In 1904-05 nearly 560,000 tons of seed were shipped and India practically monopolized the world's production, but thereafter the increased competition of the Argentine Republic, the United States of America, Canada and Russia had, when the war broke out, reduced India's share of the trade to 25 per cent.

The average production of seed in the triennium 1912, 1913, and 1914 exceeded half a million tons, of which 75 per cent was exported,

and this proportion may be taken as the normal pre-war percentage. While the war lasted, of course it was much lower. No linseed is grown in Madras, and the principal producing areas are Bihar and Orissa, the United Provinces, Bengal and the Central Provinces. The area under cultivation in the provinces for which forecasts are available aggregates ordinarily between 3 and 3½ million acres, inclusive of a mixed crop of about 600,000 acres in the United Provinces, but in years of scarcity, such as 1918-19 and 1920-21, the total is much reduced. In a good year the quantity available for export is in the neighbourhood of 500,000 tons, but this figure has only been exceeded thrice in the last ten years.

TABLE No. 79.—*Acreage under cultivation according to Provinces in 1913-14 and from 1918-19 onwards.*

Provinces.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.‡
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Central Provinces and Berar (a).	952,100	509,000	1,025,000	455,000	798,000	1,045,000
United Provinces . . . . .	240,500	69,000	230,000	121,000	238,000	251,000
	*367,000	*231,000	*559,000	*476,000	*660,000	*737,000
Bihar and Orissa . . . . .	652,900	595,000	727,000	647,000	701,000	746,000
Hyderabad State . . . . .	412,600	216,000	230,000	266,000	223,000	191,000
Bengal . . . . .	198,700	144,000	127,000	126,000	133,000	137,000
Bombay (including Indian States).	178,100	89,000	180,000	109,000	131,000	139,000
Punjab . . . . .	89,000	27,000	31,000	28,000	37,000	33,000
Rajputana (Kotah) . . . . .	†	19,000	48,000	41,000	60,000	59,000
TOTAL {	8,031,000	1,939,000	3,103,000	3,259,000	3,011,000	3,358,000
Yield Tons . . . . .	386,200	235,000	419,000	270,000	436,000	582,000

\* Mixed crop.  
 † Not available.  
 ‡ Figures are subject to revision.  
 (a) Includes Indian States from 1919-20.

The crop is sown either pure or mixed and the fair average yield may be taken at 300 lbs. to the acre. There are two readily recognised varieties grown, which yield the commercial varieties known as *yellow* and *brown* linseed respectively. The bulk of the linseed which is marketed is of the variety known as *brown*, which is graded into *bold*, *medium* and *small*. Bombay exports chiefly *bold* and *small*, and Calcutta, *medium*. The exports from Karachi, which are small, approximate to those from Calcutta in quality. *Yellow* linseed is exported only from Bombay and is generally

sold with an admixture of 'bold brown' which may amount to as much as 80 per cent. This yellow seed is mostly shipped to Marseilles where it is preferred to the usual Bombay bold quality on account of the lighter colour of the resultant oil cake which commands a slight premium in that market. Probably the total crop does not exceed 4,000 to 5,000 tons in a year.

Linseed, as has been noticed, was formerly grown in India largely to meet a foreign demand. The first mention of export from India occurs in 1832 when 3 cwts. were recorded. By 1839

Exports. the figure had risen to 60,000 tons and in 1880-81 to 300,000 tons. The exports since 1910-11 are shewn in the following table.

Linseed is generally shipped throughout the year but the busy season runs from May to July.

TABLE No. 80.—Quantity and value of exports of linseed from India from 1910-11.

Year.	Quantity.	Value.
	Tons.	£
1910-11 . . . . .	270,552	5,593,492
1911-12 . . . . .	522,023	8,643,277
1912-13 . . . . .	354,489	5,318,383
1913-14 . . . . .	413,873	4,457,998
1914-15 . . . . .	321,576	3,502,411
1915-16 . . . . .	192,987	1,982,782
1916-17 . . . . .	399,193	4,836,051
1917-18 . . . . .	146,112	1,785,307
1918-19 . . . . .	292,453	4,391,402
1919-20 . . . . .	252,415	6,977,962
1920-21 . . . . .	188,440	4,095,829
1921-22 . . . . .	173,503	2,866,808
1922-23 . . . . .	274,280	4,902,398

In 1904-05 there was a record shipment of 559,100 tons valued at £4,219,150.

The fall in 1914-15 was due more to the indifferent harvest of the previous year than to the war. In 1915-16 there was a more substantial contraction with greatly reduced exports to France and Italy and shipments to the United Kingdom at pre-war levels. In 1916-17, however, when an abundant crop coincided with a great shortage of supplies from the Plate, a recovery to 400,000 tons was achieved but in the following year, owing to smaller supplies arriving at the ports from the provinces and partly because of the curtailed demands from the chief importers, the total that left the country was very small. In 1918-19, the increased stimulus imparted to the production of margarine and edible oils to replace butter and to the manufacture of glycerine for explosives, compelled larger exports of linseed from India. The British Ministry of Food made an arrangement by which imports from India were purchased by a Director of Oils and Seeds Supply in London with the Collectors of Customs as agents at the Indian ports concerned to supervise shipments. The total quantity that went to the United Kingdom in 1918-19 was 242,000 tons or nearly 83 per cent of the whole. The volume of trade was about the same in the following year but short

stocks and high prices in India kept down the volume of exports in 1919-20. Depression in the British oilseed crushing industry and a bumper Argentine crop account for the disappointing figures of 1921-22, but there was a partial, if not complete, recovery in 1922-23 with the United Kingdom and France as principal customers, and Italy's takings approximately the same as in 1913-14.

TABLE NO. 81.—*Distribution of the trade in linseed among principal importing countries in 1913-14 and in 1922-23.*

Countries.	1913-14.		1922-23.	
	Quantity.	Percentage.	Quantity.	Percentage.
	Tons.		Tons.	
United Kingdom . . . . .	157,315	38	141,266	52
France . . . . .	115,459	28	49,616	18
Germany . . . . .	48,396	11.5	2,840	1
Belgium . . . . .	38,459	9.3	22,223	8
Italy . . . . .	30,657	7.4	30,544	11
Holland . . . . .	9,575	2.3	7,941	3
Austria . . . . .	6,500	1.5	..	..
Hungary . . . . .				
Australia . . . . .	3,360	7	11,998	4
Other countries . . . . .	4,222	1.3	7,822	3
<b>TOTAL</b> †	<b>413,873</b>	<b>100</b>	<b>274,280</b>	<b>100</b>

In pre-war days the average exports to Germany were 30,000 tons annually, but in 1913-14 she took, it will be noticed, nearly 50,000 tons and there is reason to believe that her direct imports were largely supplemented by indirect shipments *via* Belgium and Holland.

The only two ports interested in the shipment of linseed are Bombay and Calcutta, which practically share the trade between them.

The unit of sale in Calcutta is the bazaar maund and in Bombay the cwt., while sterling quotations are for the ton of 2,240 lbs. nett. *l.t.\** or *c. i. f.* Shipments are made from the former

port in single B twill bags of 164 lbs. or double E bags of 186 lbs. nett. In Bombay the unit of weight ranges from 168 to 196 lbs. gross.

The oil content of linseed varies from 37 to 43 per cent. Of the seed retained in the country for conversion into oil the bulk is dealt with in country mills by primitive methods

**Linseed oil.** but while war lasted increasing quantities were consumed in factories working on modern lines under European management. Production figures for the three leading mills in the neighbourhood of Calcutta for the twelve months ending September 1918 were 1,311,867 gallons. The following table illustrates the course of the export trade.

\* *i.e.*, landed terms.

TABLE No. 82.—Quantity and value of exports of linseed oil from India from 1910-11 onwards.

Year.	Quantity.	Value.
	Gallons.	£
1910-11 . . . . .	316,111	42,594
1911-12 . . . . .	249,975	49,966
1912-13 . . . . .	106,867	20,823
1913-14 . . . . .	102,360	17,493
1914-15 . . . . .	132,796	27,869
1915-16 . . . . .	280,850	47,274
1916-17 . . . . .	178,257	32,829
1917-18 . . . . .	590,176	127,582
1918-19 . . . . .	1,074,958	431,017
1919-20 . . . . .	438,775	132,773
1920-21 . . . . .	265,848	86,519
1921-22 . . . . .	40,222	11,742
1922-23 . . . . .	30,728	7,203

The decline in the volume of exports between 1910-11 and the outbreak of war is due chiefly to the opening of a mill in Melbourne for crushing linseed and the consequent falling off in the Australian demand for oil. At the same time the exports of seed to Australia rose from 700 tons in 1910-11 to 15,850 tons in 1917-18. The recovery in 1917-18 and the phenomenal exports in that year and in 1918-19 are due to a very strong demand, particularly from Australia for oil, in view of the restrictions placed upon shipments of seed. The fall in 1919-20 is attributable partly to a rise of 50 per cent in the price of the raw material and partly to a reduced demand for Italy, Natal and Australia. Imports of oil crushing and refining machinery into India between 1918-19 and 1920-21 exceeded £150,000 but there was a further fall in the latter year in the exports of linseed oil, and in 1921-22 and 1922-23 new low levels were reached, which is to be regretted, as in the latter year there were increased shipments of linseed to the United Kingdom. An interesting feature of the trade returns is the steady importation of linseed oil from the United Kingdom at prices lower than the *f.o.b.* price of oil manufactured in India though charged with freight, insurance, etc., but generally speaking the best Indian oil enjoys a higher reputation in the local market than the imported oil which is chiefly used for industrial purposes where first quality oil is not required. The average quantity imported annually between 1910 and 1917 was 330,000 gallons.

The unit of sale in Calcutta is the gallon and shipment is made in half-cases of 72 lbs. or in drums of 45 lbs. or barrels containing 360 lbs.

The bulk of the shipments goes from Calcutta, in the neighbourhood of which the principal mills are situated. The distribution of the trade between Calcutta and Bombay is shown below.

TABLE No. 83.—Share of the principal ports in the export of linseed oil from India in 1922-23.

Ports.	Quantity.	Percentage.
	Gallons.	
Calcutta . . . . .	29,293	95.3
Bombay . . . . .	1,409	4.6

Exports of linseed, rape and sesame cakes were until the statistical year 1918-19, grouped under one head when the compilation of separate returns for linseed cake was arranged for. The course of the trade during the last quinquennium is illustrated in the following table. During the last four years there has been remarkably little variation in the volume shipped.

TABLE No. 84.—Quantity and value of linseed cake exported.

Year.	Quantity.	Value.
	Cwts.	£
1918-19 . . . . .	122,840	46,564
1919-20 . . . . .	249,000	113,281
1920-21 . . . . .	231,980	117,627
1921-22 . . . . .	222,400	109,621
1922-23 . . . . .	226,240	111,633

The distribution of exports in 1922-23 was confined to two provinces—Bengal and Bombay, as in the case of the seed.

TABLE No. 85.—Provincial distribution of exports of linseed cake in 1922-23.

Provinces.	Quantity.	Value.
	Cwts.	£
Bengal . . . . .	118,360	55,383
Bombay . . . . .	107,880	56,250

The main destinations for linseed cake are the United Kingdom and Belgium, where they are used for manurial purposes. Germany, Hongkong and New Zealand also participated in shipments from Calcutta.

The unit of sale for this cake in Calcutta is the bazaar maund and in Bombay the cwt. Shipment is made from Calcutta in bags of 164 and 224 lbs. nett, while in Bombay the unit is the bag of 180 lbs. gross.

**Groundnut.**

The groundnut (*arachis hypogaea*) also known as pea nut, earthnut and monkey nut is, though long cultivated in India, probably not indigenous. The appearance of the Indian nut in Europe dates from about 1840, but forty years later the total exports amounted to less than 1,300 tons or little more than 1 per cent of the aggregate imports into France.\* Of 112,000 acres under the crop at this time 70,000 were in Bombay and 34,000 in Madras. In 1895-96 the corresponding figures were, Bombay 164,000 and Madras 243,000 acres. In the last decade of the nineteenth century the trade suffered from a very marked set-back due, it is said,

\* O'Connor's report on the cultivation of groundnut in India. Journ. Agri. Hort. Soc., ed. 1879, Vol. VI, nos. 97-98.

to the marked deterioration of the so-called indigenous varieties of seed which led to a great contraction both in Madras and Bombay in the area, cultivated with groundnut, the acreage in the former Presidency declining from nearly 300,000 to less than 100,000 acres. But the successful introduction of disease-resisting seed from Senegal and Mozambique with a much higher oil content is reflected in a remarkable recovery which dates from 1900-01, and under the further stimulus of an increased world demand for seeds yielding edible oils, the trade progressed steadily, particularly in Southern India, until in 1913-14 the total area devoted to the crop was not less than 2,100,000 acres, with an estimated yield of 749,000 tons. The figures for subsequent years are given below.

TABLE No. 86.—*Acreage and yield of groundnut in India from 1914-15 onwards.*

Year.	Acreage.	Yield.
		Tons.
1914-15 . . . . .	2,413,000	947,000
1915-16 . . . . .	1,664,000	1,058,000
1916-17 . . . . .	2,334,000	1,196,000
1917-18 . . . . .	1,936,000	1,056,000
1918-19 . . . . .	1,407,000	626,000
1919-20 . . . . .	1,586,000	822,000
1920-21 . . . . .	2,127,000	1,022,600
1921-22 . . . . .	2,144,000	959,000
1922-23* . . . . .	2,533,600	1,175,000

During the war several causes contributed to fluctuations in the acreage under cultivation. At first there was a marked fall in prices, disorganisation of the labour market at Marseilles and the closing down of several French mills which caused a considerable contraction in area in 1915-16, and after a good recovery in the following year, high freights and the almost complete suspension of sailings to Pondicherry and the smaller Madras ports, which in pre-war times were responsible for so considerable a portion of the exports, led to a further set-back. Fortunately, however, the yield when the area was smallest, was so abundant that the estimated outturn of the previous year was actually exceeded and again in 1917-18 the fall in acreage was to a great extent made good by a heavier crop. In 1918-19 there was a marked decline both in acreage and yield, due to failure of rains at sowing time, and the crop afterwards suffered from drought in Madras and Bombay. The record of the last three years however is one of steady recovery to pre-war levels.

The following table gives the total exports of groundnuts, oil and cake from India during the pre-war year and the last five years.

TABLE No. 87.—*Exports of groundnuts, oil and cake from British India in 1913-14 and from 1918-19 onwards.*

Articles.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
Groundnut . . (Tons)	278,000	17,000	112,000	104,000	236,000	267,000
Groundnut cake . . "	62,000	56,000	80,000	48,000	56,000	64,000
Groundnut oil . (Galls.)	228,000	690,000	828,000	144,000	56,000	53,000

\* Figures are subject to revision.

On an average 3 cwts. (36 gallons) of oil represent 10 cwts. of nuts crushed.

The greater portion of the nuts produced in the country is consumed in India, the volume of exports scarcely keeping pace even in normal times with the increased cultivation. Taking

**Exports of nuts.** the figures for the last pre-war year, *viz.*, 1913-14, it is found that considerably more than half the crop was retained for home consumption, only 278,000 tons out of 749,000, being sent out of the country. Yet in normal times the total exports from India compared very favourably with exports from the other principal producing countries of the world. When the exports from Pondicherry (chiefly grown in British India) are added to those from British Indian ports, India accounted for 364,000 tons out of a grand total of 779,000 tons received from all sources in Europe in 1913-14 the principal consuming country being France with a percentage share of 68. The following table shows the percentage borne by exports to outturn in each of the three provinces in which the crop is grown, calculated on the figures for 1913-14.

TABLE No. 88.—*Relation of provincial outturn to exports on basis of figures for 1913-14.*

Provinces.	Estimated yield of nuts.	Exports of nuts and oil.*	Percentage of exports to yield.
	Tons.	Tons.	
Madras† . . . . .	411,300	287,277	69
Bombay . . . . .	249,500	53,672	21½
Burma . . . . .	88,000	26,989	31
<b>TOTAL . . . . .</b>	<b>748,800</b>	<b>367,938</b>	<b>49</b>

In the table which follows though the Pondicherry returns are excluded, the predominance of France in the groundnut trade is very marked. In fact Marseilles prices and the Marseilles demand govern the market.

TABLE No. 89—*Quantity and value of exports from British Indian ports of groundnuts in 1913-14 and during the last five years and the principal destinations.*

Destinations.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
France . . . . .	222,380	2,558	75,425	89,210	149,200	178,710
Belgium . . . . .	16,608	..	9,755	20,155	28,290	10,409
Austria . . . . .	..	..	..	..	1,800	1,280
Hungary . . . . .	10,705	..	227	1,870	..	..
Germany . . . . .	9,436	..	..	2,002	23,702	24,656
Italy . . . . .	1,225	2,080	12,084	11,207	17,407	23,518
United Kingdom . . . . .	430	402	7,920	23,596	7,391	11,078
Other countries . . . . .	17,072	12,214	6,844	5,974	13,101	17,748
<b>TOTAL</b>	<b>277,907</b>	<b>17,199</b>	<b>111,735</b>	<b>104,015</b>	<b>285,891</b>	<b>267,994</b>
Quantity						
Value £ . . . . .	8,254,246	1,249,891	2,820,645	1,901,061	4,174,647	5,044,088

\* Converted at the rate of 36 gallons=10 cwts. of nuts crushed.

† Including Pondicherry.

The decorticated kernels are generally shipped from Madras in bags weighing 80 kilogrammes, equal to 176 English lbs. nett, and are sold in Marseilles in francs per unit of 100 kilos. The groundnuts both in

the shell, and decorticated, are usually sold in the more southerly producing districts of the Madras Presidency at so much per French candy of 529-109 English lbs., but in the northern area the unit is the English candy of 500 lbs. Sterling quotations are generally per ton of 2,240lbs. nett, *c.i.f.* Until recent years the universal method of decortivating was to damp the groundnuts and beat them with sticks to separate the brittle shells from the kernels, a method which involves considerable damage to the latter. Further, once the kernels have been wetted they are liable to discolouration and fermentation, when the oil produced from them is rancid. The use of machinery for decortivating is growing in popularity, as by this method the seed is decorticated in the dry state and the kernels are uninjured, and consequently command a much better price in foreign markets than hand decorticated kernels. There are several satisfactory types of decorticators, and the percentage of seed for export now decorticated by machine instead of by hand is increasing every year.

The best grades of oil in Europe are obtained from nuts shipped in the shell, but this method is not general from India owing to the heavy sea freights. The nuts when shipped in the shell occupy nearly double the space on the steamer than they take when shipped as kernels, and in this respect India is handicapped in comparison with the west coast of Africa where, the freight consideration being negligible, the bulk of the crop has always been shipped undecorticated. The want of adequate facilities for shipping at the minor ports in the Madras Presidency is a drawback to the South Indian trade, steamers having to lie at considerable distances from the shore owing to the shallow and surf-beaten nature of the coast and the cargo has to be carried from the shore, in lighters and small boats which facilitates speculation. In 1919-20 and 1920-21 the exports were nearly seven times as large as in 1918-19, but still less than half those of the last pre-war year, the bulk of them going to France, but in 1921-22 and 1922-23 a further recovery has been made, the competition of Bengal and West African nuts for the Marseilles market being less acute.

Before 1916, when the Burma figures swelled the total for the first time, practically the only shipments of groundnut oil from India

were from Madras and for the use of Indian **Groundnut oil.** *coolies* working in Mauritius and Ceylon. The bulk of the oil crushed is still consumed internally for domestic purposes, and the substantial increase in the foreign exports of oil from India, while the war lasted, has not been maintained since. If the gallonage is converted into the weight of seeds assumed necessary to produce it, according to the formula already given, it will be seen that the oil exported represents an almost negligible percentage of the total tonnage. The oil content of the shelled kernel is about 40 per cent.

TABLE No. 90.—The percentage share of the exports of groundnuts and oil to the total yield in India in 1913-14 and in 1922-23.

Year.	YIELD.	EXPORTS.			
	Tons.	NUTS.		OIL.	
		Tons.	Percentage to yield.	Gallons converted into tons.	Percentage to yield.
1913-14	749,000	278,000	37.1	4,003	.53
1922-23	1,175,000	267,000	22.7	734	.06

The question of further expansion of seed crushing in India on up-to-date lines appears to be limited by the difficulty of finding more remunerative markets for the cake. Machinery-pressed cake is regarded with more favour by agriculturists in India as a cattle feed than the produce of country mills, because it is less adulterated, but four-fifths of the cake retained in India is used for manurial purposes and only one-fifth as fodder. The bulk of the groundnut cake exported is taken by the United Kingdom and to a smaller extent by Ceylon, though before the war Germany was participating to some extent in the trade. Burma's principal customer is the United Kingdom while Ceylon, where the cake is admirably suited for tea plantations, relies for her supplies on Madras and Bombay. A promising trade is developing in the export of cake to Java. In the home market, the cake from the East Indies is known by the name of *Coromandel* to distinguish it from *Rufisque* derived from the African nut.

Taking the provinces, where groundnut is cultivated, in order of their importance, we find that in Madras the annual acreage is about 1,400,000, yielding on an average about half a ton of unshelled nuts per acre, or between 400,000 and 450,000 tons of kernels. The general trade name for the nuts exported from Southern India is *Pondicherry* which are classed as *small*, while a *bold* grade of the *Bombay* nut (*i.e.* shipped from that port) is also recognised. The crop is sown between July and September and comes into sight commercially between January and March. France took 88 per cent of the exports in pre-war days, no other country taking more than 4 per cent. The exports from Pondicherry chiefly to Marseilles between 1st October 1921 and 30th September 1922 (in bags of 164lbs.) amounted to 285,000.

TABLE No. 91.—Exports of groundnuts foreign and coastwise in 1922-23 from Pondicherry and principal Madras ports.

Ports.	Quantity.	Value.
	Tons.	£
Pondicherry . . . . .	39,781	†
Madras ports—		
Madras . . . . .	99,075	} 4,270,000
Cuddalore . . . . .	72,130	
Porto Novo . . . . .	15,430	
Negapatam . . . . .	12,157	
Vizagapatam . . . . .	10,097	
Callent . . . . .	8,740	
Cocanada . . . . .	3,552	
Bimlipatam . . . . .	4,453	
Other ports . . . . .	226	
Total (Madras ports) ..	225,890	4,270,000

† Not available.

Since 1919-20 there has been a gradual revival of trade in groundnuts as a result of removal of all restrictions on the export after the war, the abundance of available tonnage, and the gradual decline in freight rates. Consequently the exports from Madras ports in 1921-22 and 1922-23 were considerably above the pre-war normal.

Foreign exports of groundnut oil from Madras ports amounted in 1913-14 to 280,000 gallons, valued at £29,000, of which 48 per cent went to Ceylon and 50 per cent to Mauritius. In 1917-18 the total was 626,242 gallons, but with France eliminated and the United Kingdom, a smaller buyer, the total for 1918-19 shrank to the pre-war level. In 1922-23 the exports amounted to 36,000 gallons, valued at £5,200, of which 57 per cent went to Arabia and 32 per cent to Ceylon. Machine-pressed oil does not fetch such good prices as that pressed in *chekkus* (country mills) which is cold drawn. Groundnut oil is generally sold per candy of 500 lbs. and shipped in casks containing 350 to 400 lbs. Cochin casks holding 700 to 750 lbs. have gone out of favour and are now rarely used on account of their greater liability to leakage. There is further a large coastwise exports of groundnut oil from Madras, averaging in the last three years one and a half million gallons annually, the exports in 1922-23 amounting to 2·3 million gallons, 88 per cent of which went to Rangoon. It is of lower quality than the oil expressed in Burma and is largely used to adulterate *ghis* and other vegetable oils, and for Indian confectionery.

The foreign exports of cake in 1913-14 amounted to 472,000 cwts., valued at £106,000, of which Ceylon took about half for manurial purposes, and 38 per cent went to Germany. The corresponding figures for 1922-23 were 332,000 cwts., valued at £130,400, of which Ceylon took more than three-fourths for manurial purposes and 13 per cent went to the United Kingdom. The cake is sold either per ton or per candy of 500 lbs. and shipped in bags containing 1½ cwts. nett.

During the last fifteen years Burma has evinced a growing interest in the cultivation and crushing of groundnut. The centre of the trade is at Myingyan in the dry zone. The estimated yield in Burma in 1913-14 and the following year was in the neighbourhood of 90,000 tons from an acreage of 258,000. In 1915-16 the yield soared to nearly 120,000 tons and the estimate for 1916-17 was only slightly less. The figures for the three years 1919-20, 1920-21, and 1921-22 have been 102,000 tons, 115,000 tons, and 95,000 tons, respectively. Exports from Burma for the corresponding periods were respectively (1913-14) 538,254 cwts., (1915-16) *nil*, (1916-17) 43,160 cwts., (1919-20) 405,880 cwts., (1920-21) 99,400 cwts., (1921-22) 60 cwts. and (1922-23) 680 cwts. The cessation of foreign trade in 1915-16 and since 1921-22 will be remarked. In spite of the fact that the entire output for 1915-16 was available for use within the province itself, coastwise imports from Madras aggregated 2,000 tons of nuts and 420,000 gallons of oil. Burma's chief pre-war customers were France, Hongkong and Austria-Hungary. Exports of nuts to foreign countries in 1917-18 and 1918-19 amounted to 20,537 cwts. and 5,222 cwts., respectively.

In 1919-20 the exports of cake from Rangoon to the United Kingdom amounted to 45,000 tons and in 1922-23 to 39,600 tons. The foreign exports of Burma oil which is regarded as superior in quality to Madras oil amounted in 1915-16 to 77,000 gallons and the following year to 495,000. In 1917-18 the total was 297,990 gallons, of which 211,336 gallons went to the United Kingdom. In 1918-19, with shipments to the United Kingdom practically suspended, the aggregate was 76,836 gallons, and in 1922-23, 92 gallons only.

The unit of sale in Burma for groundnuts is a hundred baskets of 25 lbs. each and of groundnut oil and cake, a hundred viss of 360 lbs. The kernels are shipped in bags of 150 lbs. nett, the oil in casks of 80 gallons and the cake in bags of 200 to 224 lbs. nett.

The groundnut trade in Bombay has not made anything like the headway it has in Madras since the beginning of the present century.

**Bombay Presidency.** In 1895-96 three-quarters of the groundnuts exported were shipped from Bombay; in 1917-18 they represented less than 38 per cent of the whole, and in 1922-23 about 15 per cent only.

The centres of groundnut cultivation in the Bombay Presidency are Sholapur and Satara and the area under the crop in 1918-19 was 116,000 acres (inclusive of 21,000 acres in Indian States, chiefly Kolhapur) equivalent to about 10 per cent of the total area under the crop in British India. The average yield on the basis of figures for the five years ending 1917-18 is 260,000 tons. The crop in Bombay is sown about six weeks earlier than in Madras and is harvested about November. Two grades of nuts are recognised—*bold* and *small*, which are sold either shelled or unshelled. The following table illustrates the volume of the trade in groundnuts, oil and cake from the Presidency for 1913-14, 1914-15 and from 1918-19 onwards.

TABLE No. 92.—Exports of groundnuts, oil and cake from the Bombay Presidency for 1913-14 and 1914-15 and from 1918-19 onwards.

Articles.		1913-14.	1914-15.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
Groundnut	Tons	53,670	21,178	6,042	36,466	12,838	26,961	42,701
Groundnut oil.	Galls.	166	8,421	132,384	26,678	8,556	17,782	6,047
Groundnut cake.	Tons	8,031	5,112	4,263	6,182	3,729	7,701	8,927

In the last pre-war year, more than 50 per cent of the nuts went to France, the balance being divided mainly between Belgium and Germany, the share of the United Kingdom being only 40 tons. In 1916-17, however, the United Kingdom percentage of the trade rose to 20, the major quantity still finding its way to France, *viz.*, 59,000 tons. Bombay suffered less than Madras ports and Rangoon from the shortage of freight in this year, and her total shipments of groundnuts were considerably higher than in the years preceding the war. The trade in oil, which rose to 132,000 gallons in 1918-19, has since fallen again to inconsiderable dimensions (6,000 gallons), the chief customers being Mauritius and Mesopotamia. The United Kingdom and Germany were the only two customers for the cake in 1913-14, the greater part going to the former. In consequence of the temporary elimination of the German market, 85 per cent of the exportable surplus has been diverted to Ceylon, and the balance only to the United Kingdom, but the total is below pre-war levels.

The unit of sale in Bombay for groundnuts is the candy of 20 Bombay maunds, for oil, the maund of 28 lbs. or the cwt., and for cake, the cwt. Shipment of the decorticated nuts is made in bags of 168 to 182 lbs. and the undecorticated nuts in bags weighing 85 lbs. or less, while the oil is packed for export in tins of 84 lbs. or drums of 6 or 8 gallons. Cakes are shipped in hydraulic pressed bags of 180 lbs. or in native pressed bags of 161 or 168 lbs. Sterling quotations for the nuts are generally based on the ton of 2,240 lbs. nett, *c.i.f.*

#### Rape and Mustard Seed.

The term rapeseed is commercially often indifferently used to denote at least two sub-species of *brassica campestris*, *viz.*, Indian colza or *sarson* and Indian rape or *toria*, while mustard seed is

**Trade varieties.** derived from a closely allied species, *brassica juncea*. The chief qualities of rapeseed recognised by the exporters are *toria*, brown bluish in colour, chiefly exported from Karachi, *Ferozepore brown*, *brown Cawnpore*, chiefly shipped from Bombay and Calcutta, *brown Delhi*, mainly exported from Bombay and Karachi, *yellow bold*, from Bombay and *yellow small* from Bombay and Calcutta.

Excepting for a small area devoted to mustard seed in the south, for which no separate figures are available, the cultivation of rape and

**Area and production.** mustard is entirely restricted to Upper India, the average acreage under the two crops, inclusive of mixed cultivation in the United Provinces, being estimated

at 6,000,000 acres, of which the United Provinces account for 40 per cent, Bengal 22 per cent, Punjab 19 per cent, and Bihar and Orissa 10 per cent. The actual figures for 1917-18 were considerably more than this estimate, viz., 6,924,000 acres. The crops are grown either pure or mixed almost entirely on unirrigated land and are sown in October or November and gathered in February or March. The total annual outturn of rape and mustard seed has been put at 1,260,000 tons, equivalent to 4 cwts. only per acre, but when rape is cultivated by itself as a pure crop the yield is probably appreciably higher. In parts of the country the crop is cut green in January for cattle fodder. In up-country markets the bulk of the crop is disposed of between March and July and the principal trade centres are Cawnpore in the United Provinces and Ferozepore in the Punjab where supplies are collected for export *via* Bombay and Karachi.

India has always been the principal source of the rapeseed imported into Europe in supplement to the supplies of Russia (chiefly rapison), Roumania (chiefly colza) and France. The other countries contributing to the world's exportable surplus in recent years are China and Japan and to a modest extent Argentina and the Dutch East Indies also. In pre-war years the proportion of exports to total production was about 20 per cent or 240,000 tons per annum. Most of the seed grown in Bengal and Bihar would appear to be retained for local consumption, and the principal exporting centres were Karachi and Bombay. The figures for all ports are combined in the table below, which shews the principal destinations for the seed.

TABLE No. 93.—Exports and destinations of rapeseed from India for 1913-14 and from 1918-19 onwards.

Countries.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Belgium	98,869	..	80,366	119,519	45,928	58,960
Germany	58,199	..	..	24,182	38,526	68,125
France	53,948	10,729	17,971	10,026	7,831	28,856
United Kingdom	14,996	54,468	69,468	20,382	27,866	46,686
Italy	18,723	4,088	2,616	6,688	10,169	27,084
Japan	1	9,906	..	..	1,470	8,233
Other countries	10,168	471	8,010	1,181	6,868	20,072

Though Belgium was, before the war, nominally the principal market, there is little doubt that a great deal of her imports *via* Antwerp found their way eventually to Holland and Germany. Germany is now the principal recipient but the United Kingdom and Italy are taking a larger share, while those of Belgium and France have correspondingly declined.

The effect of the war on the trade was very perceptible. In 1914-15 only 97,000 tons were exported as against 249,000 tons in the previous year, a partial revival being experienced only in 1916-17 when 122,000 tons were sent out of the country. Of this the greater portion was taken by the United Kingdom and France, both of which countries formerly relied for their supplies on Russia to a great extent. There was a great

set-back again in 1917-18 owing to lack of tonnage. With the United Kingdom trade reduced by two-thirds and with France's requirements much curtailed, it was easy to satisfy a fleeting interest on the part of Japan in the crushing of rapeseed for oil.

The unit of sale in Karachi is the candy of 656 lbs. and in Bombay the cwt. Shipment is made from Karachi in bags of 164 to 206 lbs.

**Unit of sale and shipment.** net, from Bombay in bags of 168 to 182 lbs. and from Calcutta of 164 or 186 lbs. Sterling quotations are generally on the basis of the ton of 2,240 lbs. nett, *c.i.f.*

The average quantity of mustard seed exported does not usually exceed 5,000 tons a year and even that is believed to contain a large admixture of rapeseed. In the last pre-war year

**Exports of mustard seed.** it was 5,104 tons and in 1916-17, 6,174 tons.

The bulk of the exports goes from Bombay packed in bags of 168 to 182 lbs., and France is the chief customer, more than 50 per cent being appropriated by her every year. Occasional shipments were made to Germany in pre-war days. From South India there is a small trade with Ceylon and to a limited extent with France, the ports of export being Madras, Cocanada, and Tuticorin. The unit of sale in Bombay is the candy of 22½ Bombay maunds.

Large quantities of rape and mustard seed are annually crushed in India for local consumption in the form of oil which is commonly used,

**Rape and mustard oil.** particularly in Bengal for cooking purposes and generally by Hindus to anoint the body.

Indian seed is assumed to yield from 42 to 45 per cent of oil. Mustard oil is not uncommonly adulterated in the bazaars, if not for the export market, with gingelly, mowra and *pakra* which is obtained from the seeds of *schleichera trijuga* (*kusumb*). The refining of rapeseed oil, as colza is refined in Central Europe for the manufacture of margarine, has not yet been taken up in India. Pre-war exports from India averaged about 400,000 gallons (including mustard oil) of which practically the whole went to British Possessions and nearly three-quarters to Mauritius and Natal alone for the Indian *coolie* population in those colonies. In 1915-16, 352,969 gallons, out of a total of 465,735 gallons, went to these two destinations. Large quantities are also sent and for the same reason to Fiji and British Guiana. In 1916-17 the total quantity of oil exported exceeded 574,000 gallons and in 1917-18, 488,000 gallons. In 1922-23 despatches amounted to 426,700 gallons.

TABLE No. 94.—Quantities and values of rapeseed and mustard seed and rape and mustard oil exported from India in 1913-14 and during the last five years.

Article.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
<b>Rapeseed—</b>						
Quantity . . . Tons	249,005	78,668	122,818	188,323	183,697	251,981
Value . . . £	2,851,711	968,811	2,646,725	3,527,111	2,111,828	3,721,15F
<b>Mustard Seed—</b>						
Quantity . . . Tons	5,104	1,888	2,870	1,969	752	3,818
Value . . . £	70,724	46,821	103,701	34,771	15,368	79,815
<b>Rape and Mustard oil—</b>						
Quantity . . . Gallons	407,178	285,672	352,905	388,064	210,295	426,675
Value . . . £	48,624	56,532	75,970	75,045	55,954	80,084

Karachi and Calcutta are the principal ports concerned. The unit of sale is the Indian maund at the former port and the bazaar maund at the latter, while shipment is made from Calcutta in drums of 45 lbs. or half cases of 72 lbs. and from Karachi in tins of 17½ to 18 seers.

Rapeseed cake, though accepted on the Continent as cattle fodder, is chiefly used in the United Kingdom for manurial purposes. Japan has always been a good market for Indian rapeseed cake, and since 1913-14 a fresh opening has been found to a small extent in the Straits Settlements. The quantity of rapeseed cake (together with sesamum cake) exported in 1922-23 was 62,000 tons, valued at £473,200, the principal recipients being Japan and Ceylon.

### Sesame.

The seed of *sesamum indicum*, an annual plant thriving in the tropical and sub-tropical parts of the world and variously known to the trade as *til*, *teel*, *gingelly* or *sesame*, yields a valuable oil. The seed is generally grown in India, except in the United Provinces, as a pure crop, and a fair average yield is about 300 lbs. to the acre. In Southern India it is probably higher. Cultivation extends to almost all the provinces of India but the crop is raised most extensively in Bombay, Burma, Madras and in the Central Provinces. The all-India total in a good average year may be placed at 5,500,000 acres and the output at 500,000 tons. The following table illustrates the distribution of the crop and the annual yield in 1913-14 and from 1918-19 onwards.

TABLE NO. 95.—*Acres and yield of sesame in India in 1913-14 and from 1918-19 onwards.*

Provinces.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.*	
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
Burma	(a)	(a)	(a)	(a)	1,034,000	865,000	
Central Provinces and Berar	865,700	497,000	489,000	708,000	773,000	590,000	
Bombay (including Indian States).	861,200	217,000	521,000	546,000	643,000	547,000	
Madras	809,300	681,000	881,000	753,000	778,000	727,000	
Hyderabad State	612,000	612,000	538,000	520,000	564,000	530,000	
United Provinces	378,400	207,000	188,000	276,000	250,000	108,000	
Bengal	1,350,000	1,282,000	1,373,000	1,375,000	1,295,000	1,375,000	
Bihar and Orissa (b)	241,000	218,000	210,000	192,000	208,000	156,000	
Punjab	219,700	194,000	192,000	167,000	192,000	192,000	
Baroda State	144,100	51,000	110,000	108,000	150,000	147,000	
Rajputana (Kotah)	(a)	23,000	73,000	77,000	75,000	76,000	
Other Provinces	104,600	15,000	48,000	48,000	68,000	48,000	
TOTAL	ACREAGE	5,076,000	3,686,000	4,254,000	4,432,000	5,746,000	5,006,000
	YIELD . tons .	408,500	278,000	440,000	382,000	518,000	484,000

\* Figures are subject to revision.

† Mixed crop.

(a) Not available.

(b) Excluding Feudatory States.

(c) Included under Bombay.

The new crop comes on to the up-country markets towards the end of November and sales are heavy till March. Five qualities are known to the trade, *white, black, mixed yellow and red*, of which the first-named is regarded as having the highest oil content. The chief port of export for this variety is Bombay.

In the last pre-war year the exports of sesame seed from India amounted to 112,200 tons, only exceeded by China with 121,000 tons.

About 50 per cent of the world's supply is found by the British Empire, to which India contributes half. Between 1870 and 1890 France was the principal customer for Indian sesame and took nearly 75 to 85 per cent of the exports, but this proportion has declined since groundnuts displaced sesame in the Marseilles market and the trade of the quinquennium, 1910-11 to 1914-15, indicated an average import of only 33,000 tons, out of India's total of 100,000 tons. In 1912-13 the position of the trade was as follows. The total exports amounted to 78,000 tons, of which 21,700 tons went to France, and 19,000 to Austria-Hungary and about 18,000 to Belgium, other importers being Italy and Germany with very much smaller quantities. The distribution of the trade in 1913-14, the last pre-war year, and from 1918-19 onwards is indicated in the following table.

TABLE NO. 96.—Share of the principal importing countries of sesame in 1913-14 and from 1918-19 onwards.

Countries.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Belgium . . . . .	32,800	..	4,867	1,550	1,975	2,425
France . . . . .	22,200	150	20,224	703	2,791	9,432
Austria* . . . . .	19,000	..	1,942	788	6,550	4,860
Germany . . . . .	16,000	..	..	..	228	8,416
Italy . . . . .	14,000	..	15,178	5,652	10,687	11,938
Ceylon . . . . .	1,617	618	818	829	1,422	1,672
Egypt . . . . .	1,242	87	200	..	58	198
Aden . . . . .	879	246	1,823	611	315	114
United Kingdom . . . . .	..	..	..	6	76	49
Other countries . . . . .	2,568	1,808	5,304	1,748	5,001	3,387
TOTAL { QUANTITY . . . . .	112,201	2,984	49,328	11,682	31,098	36,436
{ VALUE . . . . .	£ 1,796,841	46,078	1,562,667	310,908	632,445	727,020

\* Figures prior to 1921-22 represent Austria-Hungary.

The figures for the last quinquennium reflect in no uncertain manner the increasing competition which Indian sesame is meeting in the world markets from Chinese sesame, West African palm kernels and the tendency of soap makers to utilize groundnut in preference.

The total exports for 1922-23 are less than a third of those for 1913-14 but there was a slight improvement in the volume of the trade with France at the expense of China, while Germany has once more entered the list of competitors.

There have never at any time been exports of any magnitude to the United Kingdom or to other parts of the British Empire till 1916-17, when 25 per cent was absorbed by the former. The ports, most concerned in the shipment, are Bombay and Karachi on the west coast and Cocanada, Bimlipatam, and Vizagapatam on the Bay of Bengal.

Of these markets Bombay is far the largest. There are practically no exports from Burma as the entire crop is retained for home consumption.

In the Madras Presidency the unit of sale as well as of shipment is generally the single gunny bag of 164 lbs. nett, while in Bombay, the weight varies for shipment from 154 to 168 lbs. nett and in Karachi, the bags weigh 164, 168 or 184 lbs. nett. The unit of sale in Bombay is the candy of 20 Bombay maunds and in Karachi the candy of 656 lbs., but quotations for export are per ton of 2,240 lbs. nett, *c.i.f.*

The percentage of oil in *til* seed is assumed to be in the neighbourhood of 40. Though the oil is generally extracted in crude mills, worked by bullocks, the better qualities are clear and nearly colourless. Most of it is retained in India for cooking purposes and as an illuminant or for anointing the body. The average annual export of oil from India was in the neighbourhood of 200,000 gallons before the war, but since then the volume of trade has been subject to considerable fluctuations. The distribution of the trade among the principal provinces in the last pre-war year and in 1922-23 is contrasted in the table below.

TABLE NO. 97.—*Distribution of the exports of sesame oil according to provinces in 1913-14 and in 1922-23.*

Provinces.	1913-14.		1922-23.	
	Quantity.	Value.	Quantity.	Value.
	Gallons.	£	Gallons.	£
Bombay (including Sind)	153,680	20,991	85,473	14,251
Madras	53,102	7,520	7,366	1,346
Bengal	911	128	49	10
Burma	360	60	2	1
TOTAL	208,053	28,699	92,890	15,508

The Bombay trade, which is the most important, is mainly with Maskat territory and Mauritius and the war has not created any alteration in the direction of exports. Pre-war shipments from Karachi averaged only 3,000 gallons but in 1916-17 nearly 20,000 gallons and in the following year 55,000 gallons went forward, mainly to Aden and Maskat.

In Madras the principal ports of shipment are Tuticorin for the Ceylon market and Madras, Cuddalore and Negapatam for the Straits, and the demand is chiefly on behalf of the Indian *coolie* population in these colonies but the market is a small one. The following table shews exports from India in 1913-14 and from 1918-19 onwards, classified according to destinations.

TABLE NO. 98.—Share of the principal importing countries of sesame oil in 1913-14 and from 1918-19 onwards.

Countries.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
Mascat Territory and Trucial Oman . . . . .	68,570	27,304	81,490	60,441	42,984	52,819
Aden and dependancies . . . . .	35,647	2,561	3,254	2,435	2,401	2,899
Ceylon . . . . .	31,609	4,894	3,158	1,344	5,517	2,899
German East Africa† . . . . .	10,443	3,531	1,705	407	1,834	1,883
Straits Settlements . . . . .	15,337	893	407	5,913	1,834	1,883
Mauritius and dependancies . . . . .	6,986	16,327	13,852	316	15,328	23,473
Natal . . . . .	5,882	2,070	4,754	1,078	830	1,371
United Kingdom . . . . .	4,198	79	19,988	391	249	390
Other countries . . . . .	24,533	55,041	40,095	35,510	26,155	7,751
TOTAL QUANTITY . . . . .	203,113	112,500	188,508	107,822	104,289	92,890
TOTAL VALUE . . . . .	£ 28,699	19,567	36,793	22,107	18,547	15,808

† Shown as "Tanganyika Territory" from 1921-22 onwards.

The unit of sale of the oil in Bombay is the maund of 28 lbs. and in Karachi of 32½ lbs. Shipment is made from the former port in 2-tin cases of 84 lbs. or casks of 5 cwts. and from Karachi in tins of 17½ or 18 seers. In Madras sales are generally on the candy of 500 lbs. and shipment is made in casks of 400 to 500 lbs. In Tuticorin the oil is shipped in casks containing 80 gallons and in Negapatam in tins of 4 gallons.

There is practically no foreign market for the cake except in Ceylon where it is in considerable demand for manurial purposes. In India it is more commonly used as cattle fodder either alone or in conjunction with *poonac* (coconut cake). The combined total volume of exports of sesame and rape cake in 1922-23 amounted to as much as 62,000 tons, valued at £473,200, Japan and Ceylon being the principal recipients.

#### Cotton Seed.

In the matter of production of cotton seed, India occupies a position next only to that of the United States of America, contributing annually about 2,000,000 tons of the world's total of 11,000,000, but scientific utilization of the greater part of her supplies has scarcely yet been attempted.

Exports of cotton seed from India vary from year to year according to the season, for when there is any scarcity it is hoarded as winter feed for cattle, but even in a year of plenty they probably do not exceed 15 per cent of the seed available.

About 200,000 tons are required annually for sowing and the normal consumption in the Punjab, as food for milch-cows, has been estimated at about the same figure. Considerable quantities are also crushed for oil and cake, but the balance, available for export, should largely exceed the 300,000 tons which is the average of the three years preceding the war. The trade, such as it is, may be described as of modern growth, originating in inquiries from the United Kingdom for Indian seed, about the year 1900, in consequence of German competition in the Egyptian cotton seed market at a time when a scarcity of olive

oil and sesame in the market and the necessity of finding substitutes for the preparation of lard and margarine coincided with the discovery of a new process of hulling the seed cheaply. From 1901-02 onwards the value of exports progressed steadily until 1913-14. In 1900-01 the total was 11,250 tons only, but it rose in the following year to 101,800 tons and in 1910-11 to nearly 300,000 tons. The figures of total quantity and value and the percentage of shipments to the United Kingdom during the last ten years are given below.

TABLE NO. 99.—Quantity and value of exports of cotton seed and percentage of shipments to the United Kingdom from 1913-14 to 1922-23.

Year.	Quantity.	Value.	Percentage to the United Kingdom.
	Tons.	£	
1913-14 . . . . .	284,327	1,416,743	98
1914-15 . . . . .	207,789	1,004,524	97
1915-16 . . . . .	95,664	445,077	95
1916-17 . . . . .	39,630	203,940	94
1917-18 . . . . .	1,675	9,587	Nil.
1918-19 . . . . .	1,454	11,810	Nil.
1919-20 . . . . .	248,749	2,437,085	98
1920-21 . . . . .	99,900	690,937	98
1921-22 . . . . .	92,221	684,395	95
1922-23 . . . . .	183,192	1,314,867	99

The United Kingdom percentage in 1900-01 was only 62. While the war lasted there was a progressive decline, due partly to freight difficulties and partly to a fall in prices, but 1919-20 marked a recovery almost to pre-war levels, which however was not sustained in 1920-21 and the following year, and the figures for 1922-23 though more encouraging, are less than two-thirds of those for 1913-14. About 92 per cent of the cotton seed exported in a normal year goes from Bombay, 6 per cent from Karachi and 1½ per cent from Madras ports. Shipments of the seed are usually effected between January and July.

The usual qualities of seed obtainable in the market are (1) *Bombay*, (2) *Delhi-Cawnpore*, (3) *American* (from seed originally imported from America), all shipped from Bombay and known as *Bombay* in the United Kingdom market,

**Trade varieties.**  
(4) *Comilla* (Eastern Bengal) chiefly shipped from Calcutta and (5) *Rangoon*, exported from Burma. Of these (2), (4) and (5) are generally regarded as inferior as they contain a larger percentage of damaged and worm-eaten seeds. The *American* quality commands normally a small premium over *Bombay*, though it is the latter that is most extensively exported. Shipments from Karachi are mostly of varieties (2) and (3). Indian cotton seed generally belongs to the class known as 'white' or 'fuzzy,' as in addition to the outer layer of true cotton fibre, it has on it an underlayer of fluff or lint which is not removed before shipment. It is valued in Europe on the basis of 18 per cent oil, but the average yield of oil in India is considerably lower. In Burma the oil content is normally assumed to be 10 per cent only.

The unit of sale in the Bombay market is the candy of 784 lbs. gross *tail quale*, while contracts with the United Kingdom are per ton of 2,240 lbs. *c.i.f.* In Karachi sales are based on the standard maund. The unit of shipment in Bombay is the bag of 140 lbs., in Karachi the bag of 123½ lbs. and in Madras 165 lbs., but there is a good deal of latitude at the first port in particular in the weights shipped.

In comparison with other vegetable oils, the production of cotton seed oil in India is very limited. The seed is not decorticated before crushing. In 1913-14 only 2,507 gallons were shipped, the entire quantity being from the Bombay Presidency, but while the war lasted there was an appreciable development of the trade in Burma where a good quality of oil was produced, the residue known as *foots* being sold in Rangoon for the manufacture of cheap soap. The oil was packed in Rangoon in 40-lb. tins at the factory and shipped mostly to the United Kingdom, but a considerable quantity also found its way to Australia. The following table illustrates the vicissitudes of the trade which reached its apex in 1919-20 but has since practically ceased owing to the complete elimination of the United Kingdom market.

**Cottonseed oil.**

TABLE No. 100.—Quantity and value of cottonseed oil exported from 1913-14 onwards.

Year.	Quantity.	Value.
	Gallons.	£
1913-14 . . . . .	2,507	347
1914-15 . . . . .	12,471	1,059
1915-16 . . . . .	43,030	4,031
1916-17 . . . . .	84,156	10,004
1917-18 . . . . .	76,308	9,595
1918-19 . . . . .	9,356	1,183
1919-20 . . . . .	132,486	25,762
1920-21 . . . . .	18,977	4,208
1921-22 . . . . .	486	65
1922-23 . . . . .	8	2

The unit of sale in Bombay is the maund of 28 lbs. and the oil is shipped in 42-lb. tins. Sales are made in Rangoon per 100 viss of 360 lbs.

There is no considerable market in India for cottonseed cake as cattle fodder, as it is usual to give milch-cows the uncrushed seed, and there should be considerable quantities available for export, if fresh markets for the oil could be found. 10,000 tons valued at £50,000 were exported in 1913-14 to which Burma contributed half, though in point of production of seed her share was only 1 per cent. 90 per cent of this went to the United Kingdom. In 1914-15 the effects of the war began to be felt and the value of the cake exported was only £31,000 and in the following year it dropped still lower to £23,000. The totals for 1916-17 and 1917-18 were £15,500 and £800, with a partial recovery in 1918-19 to £7,000. In 1920-21, 8,72 ns were exported, valued at £62,354, chiefly to the

**Cottonseed cake.**

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United Kingdom and Japan, and the corresponding figures for 1922-23 were 3,429 tons and £28,628. Outside Burma, the trade in cottonseed cake is confined almost entirely to Bombay, whence shipment is made in bags of 168 to 180 lbs. gross. The unit of sale in Burma is a 100 viss of 360 lbs. and shipment is effected in bags, weighing 200 to 224 lbs. nett.

#### Castor Seed.

The castor oil plant (*ricinus communis*) has long been cultivated in India, but until the beginning of the nineteenth century there were

considerable imports, doubtless for medicinal purposes, of the oil and no recorded exports either of oil or seed. Foreign trade in the Indian seed is indeed of comparatively recent growth. The plant is so widely grown over India as a mixed crop that no accurate estimate can be attempted of the area under it, but the provinces, where it is principally grown, are Madras (particularly in the Ceded Districts), Hyderabad State, Bombay and the Central Provinces. A fair average yield is 300 to 400 lbs. of seed per acre and the crop takes eight to twelve months to mature. The annual outturn may be put at between 250,000 and 300,000 tons per annum. Two principal varieties of the plant are cultivated. The oil, which, before the invasion of kerosene and electric light, was in scarcely less demand than coconut oil as an illuminant for the houses of Europeans and Indians alike, is derived chiefly from the large-seeded variety: the well-known medicinal oil from the small-seeded. The seeds after picking are sun-dried and husked and are then ready for the market. Four chief qualities are recognised by the trade, namely, *Bombay small seed (Deccan)*, *Madras small seed (Deccan)*, *Cawnpore* and *Calcutta*. The two first-named are very similar and only differ in the port of shipment. The characteristic of Calcutta quality is a *bold* seed, and this is even more marked in the case of Cawnpore. Neither quality gives such a high yield of oil as the smaller seed. The crop comes on to the markets up-country in March and April but the bulk of the sales are completed by the end of May.

Though Java, Indo-China and Manchuria are beginning to grow castor on a commercial scale, India yet commands a preponderating share of the world's export trade in the seed. The

first recorded export was some 225 tons in 1877-78, but in the next year 11,880 tons were shipped and in 1913-14 134,888 tons. War conditions then emphasized the disadvantages of shipping raw material instead of the less bulky and more valuable manufactured product and while the exports of oil temporarily shewed satisfactory expansion, those of seed fell away. In pre-war times the United Kingdom took nearly half the exports. About 80 per cent of the arrivals in the United Kingdom went to Hull to be crushed and the balance was re-exported to Russia and the United States. The United States trade, direct and through United Kingdom ports, has always been very steady. The volume of exports to Germany in 1913-14 was, it should be remarked, nearly 100 per cent above the average for the previous five years. The feature of recent years has been an improved American demand, while in 1922-23 France has nearly reached pre-war parity.

TABLE No. 101.—Exports of castor seed from India according to destinations in 1913-14 and from 1918-19 onwards.

Destinations.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
United Kingdom . . . . .	55,975	82,838	2,849	7,042	11,828	16,149
Franco . . . . .	20,889	16,735	1,025	1,178	7,536	15,839
United States of America . . . . .	20,279	..	890	3,700	20,515	33,024
Belgium . . . . .	14,822	..	410	701	4,401	8,214
Italy . . . . .	11,738	1,127	3,203	1,968	2,550	8,010
Germany . . . . .	9,671	..	..	..	50	400
Spain . . . . .	975	..	..	200	1,400	1,758
Australia . . . . .	589	1,278	..	590	302	321
Other countries . . . . .	1	11	87	62	158	109
TOTAL	134,789	81,989	8,464	15,581	48,798	88,618
QUANTITY	134,789	81,989	8,464	15,581	48,798	88,618
VALUE £	1,386,649	1,534,238	154,227	234,104	698,524	1,222,482

The bulk of the seed is exported from Bombay, which receives its supplies from Berar and Hyderabad as well as from the Presidency. The exports from Calcutta are usually from Bihar and the United Provinces, but in the last two years of the war, a good deal of the seed shipped was railed up from the north-eastern districts of Madras, whence freight was unobtainable. The Madras export trade, which comes next in importance, is centred at Cocanada. The small-seeded varieties, locally known as *Coasts* and *Warangals*, go from the former port and *Salems*, which are large-seeded, from the latter. 13,000 tons were exported from Madras in 1917-18 to the United Kingdom for the Aircraft Board.

In 1918-19 to satisfy the increasing demands of the Air Ministry, the Director of Oils and Seeds Supply in London made arrangements for the purchase of Indian castor seed on lines similar to those for linseed. Under this scheme, over 40,000 tons of castor seed were shipped from Bombay, 11,000 tons from Madras and 3,200 from Calcutta.

The distribution of the trade among the principal ports in the last pre-war year is contrasted below with that for 1922-23. A remarkable increase will be noted in the proportion of the shipments from Cocanada.

TABLE No. 102.—Share of the principal ports in the export of castor seed from India in 1913-14 and 1922-23.

Ports.	1913-14.		1922-23.	
	Quantity.	Percentage.	Quantity.	Percentage.
Bombay . . . . .	Tons. 115,389	85	Tons. 49,561	59
Calcutta . . . . .	9,989	7	1,090	1
Cocanada . . . . .	6,977	5	27,850	33
Madras . . . . .	2,451	2	303	4

The unit of sale in Bombay is the candy of 20 Bombay maunds and in Calcutta the bazaar maund. Shipment goes forward from the former port in single B twills of 154 to 168 lbs. nett and from Calcutta in bags of 150 lbs. nett. The unit of shipment at Cocanada and Madras is the bag of 164 lbs. nett, while sales are on the basis of the candy of

500 lbs. in Madras and the bag of 164 lbs. in Cocanada. Quotations for export are per ton of 2,240 lbs. nett, c.i.f.

Castor oil figured in India's export trade much earlier than castor seed, 20,207 lbs. being sold at the East India sales in 1804 at a price which works out at 22s. 6d. a gallon. In

1889-90, 2,664,990 gallons of oil were exported, but the primitive methods of extraction and inferior quality of the oil (due in part to deliberate adulteration) turned the scale thereafter in favour of the export of the seed and the pendulum did not swing back again until after the outbreak of war. In 1912-13 the total had fallen below a million gallons, of which nearly the whole went to the United Kingdom and British Possessions, particularly to Australia and New Zealand. The figures of export for the last five years are shown in the following table. The oil content of castor seed is about 40 per cent.

TABLE No. 103.—Quantity and value of castor oil exported in 1913-14 and from 1918-19 onwards.

	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
QUANTITY . . . Gallons	1,007,001	1,658,589	297,029	308,346	193,459	602,877
VALUE . . . . . £	92,504	298,102	68,093	50,918	27,410	97,691

A good deal of the country-pressed oil is retained for home consumption, chiefly as a lubricant and an illuminant. Large quantities are also utilized for dressing leather and in the manufacture of Turkey red oil. A considerable quantity of Madras-grown castor seed is railed to Calcutta for crushing. There are a great number of small oil mills in the neighbourhood of Calcutta working with castor, in addition to two or three European-managed concerns.

Even with the improvement in the volume of export between 1915 and 1918 the figures of 1889-90 were not attained, and after the armistice, there has been again a marked set-back, though the great enhancement in price, which has meanwhile taken place, raised the total values of 1922-23 above those of 1913-14. The distribution of the trade is shown in the next table.

TABLE No. 104.—Exports of castor oil from India in 1913-14 and from 1918-19 onwards according to countries.

Countries.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
Australia . . . . .	360,252	14,977	11,349	32,506	22,811	24,988
New Zealand . . . . .	146,659	58,997	22,389	116,662	16,893	42,880
Straits Settlements . . . . .	141,414	3,078	17,383	15,266	17,444	21,131
Mauritius . . . . .	92,050	17,969	69,882	44,467	89,414	42,178
United Kingdom . . . . .	87,256	893,776	9,445	2,313	32,936	390,402
Ceylon . . . . .	73,730	11,930	17,121	22,699	25,901	19,488
Union of South Africa . . . . .	59,659	26,530	91,682	37,469	17,866	41,927
Siam . . . . .	12,273	336	939	..	142	437
Portuguese East Africa . . . . .	8,346	..	2,409	6,429	4,669	2,510
Italy . . . . .	..	627,173	4,472	48	..	..
France . . . . .	..	..	..	..	1,069	..
Other countries . . . . .	21,043	4,078	60,323	26,480	29,824	6,266

The total imports of castor oil into the United Kingdom in 1914 and 1915 were only 196,000 and 177,000 gallons, respectively, but with the increasing demand for herself and her Allies of this oil for the lubrication of aeroplane engines the total for 1916 was over 1,300,000 gallons, of which India supplied 1,220,000 gallons. The figures for 1917-18 and 1918-19 were 1,086,000 and 893,800 gallons, respectively. The feature of the returns for 1922-23 is the preponderating share once more taken by the United Kingdom.

In 1922-23 68 per cent of the oil was exported from Cocanada and the balance from Calcutta (30 per cent) and Madras. In Calcutta the unit of sale is the bazaar maund and shipment is made in cases containing 17 gallons or half cases of 8½ gallons or in 5-gallon drums. The oil is shipped from Bombay in tins or cans of 7 and 40 lbs. or in casks of 588 lbs., while Cocanada prefers the barrel of 400 lbs. nett. The unit of sale at the latter port is the candy of 500 lbs.

The actual production of castor cake is difficult to estimate, but the internal consumption for manurial purposes is considerable, particularly for tea and sugarcane. The presence of a poisonous substance, called ricin, remaining in the cake after the oil has been extracted, renders it unsuitable for cattle fodder. In pre-war years the average quantity exported was in the neighbourhood of 6,000 tons, but this has fallen in the last two years to less than a thousand tons.

TABLE No. 105.—Exports of castor cake from 1913-14 onwards.

Year.	Quantities.	Values.
	Tons.	£
1913-14 . . . . .	4,902	19,385
1914-15 . . . . .	3,947	13,839
1915-16 . . . . .	11,476	44,906
1916-17 . . . . .	9,999	46,885
1917-18 . . . . .	2,896	13,637
1918-19 . . . . .	4,284	23,297
1919-20 . . . . .	4,050	27,917
1920-21 . . . . .	1,639	12,971
1921-22 . . . . .	864	4,873
1922-23 . . . . .	952	5,600

The bulk of the shipments was made from Cocanada, Tuticorin and Madras, in that order, and 95 per cent of the whole went to Ceylon for tea estates, the unit of shipment being the bag of 164 and 196 lbs. The unit of sale is generally the bag of 164 lbs., but the candy of 500 lbs. is also employed in Madras.

## Copra.

It is estimated that the value of the products of the coconut in the world's markets in the year before the outbreak of war exceeded £70 millions or nearly double the value of the world's output of rubber. The coconut palm (*cocos nucifera*) makes four principal contributions to

commerce, viz., (a) *copra*, the dried kernel of the nut, (b) coconut oil, the oil extracted from (a), (c) *poonac*, the residual cake, and (d) *coir*, the fibre derived from the husk surrounding the nut. A well distributed rainfall, a sandy soil containing plenty of decayed vegetable matter and not liable to become water logged and protection from strong winds are essential to the growth of the coconut. The mean temperature should be from 75° F. to 85° F., and the mean annual rainfall should not be less than 50 inches. Coconuts grow particularly well close to the sea, but there is no reason why a plantation should not be successful up to an altitude of 2,000 feet provided that other requirements are fulfilled. In India the tracts where the coconut flourishes best are the Kathiawar, Kanara and Ratnagiri districts of Bombay, and Malabar and South Kanara districts and the Godavari delta in Madras, the Indian States of Travancore and Cochin, the lower basins of the Ganges and Brahmaputra in Northern India and the Irrawaddy delta in Burma. No estimate can be attempted of the acreage under coconut in India, but it must be very considerable.

Whereas in exceptionally well-situated areas the yield of a single mature tree may run up to 200 nuts, the average may be placed at 50 to 75 nuts a tree and in Malabar the outturn per acre may range from 4,000 to 5,000 nuts equivalent to one ton of copra. The acreage under coconut cultivation in the Madras Presidency has been estimated at 800,000 (of which more than half is assigned to Malabar alone) with a total annual yield of at least two milliards of nuts. There are no large plantations under one management, and the industry has hitherto been almost entirely in the hands of small Indian cultivators. The produce of the Coromandel coast, as of Bombay and Bengal, largely disappears in local consumption. The total internal consumption of coconuts in India has been roughly estimated at 400 million nuts a year, but is probably much higher.

The most important coconut product, copra, which is the trade name for the dried kernel of the nut, had nearly doubled in price during the five years preceding the war. Malabar copra\* is sun-dried in the sand by the sea-shore or in cemented yards (known as *barbecues*) under nets, the process taking from 5 to 10 days and at seasons when non-liability to damage from rain is practically assured.

The exports of copra from India never at any time represented more than a seventh of the world's trade in this article and have always been considerably smaller than those of Ceylon, whose exports in 1914 exceeded 70,000 tons.

The value of the exports from the Malabar Coast ports trebled between the years 1908-09 and 1913-14, but since then have substantially

\* i.e. the copra of the west coast from Mangalore to Cape Comorin.

declined and the total for 1923-24 is more likely to approximate to that of 1921-22 than that of 1922-23.

It would seem that shippers are finding increasing difficulty in securing supplies at prices acceptable to purchasers in the United Kingdom and on the Continent in competition with the Ceylon and Manila product. Although cocount cultivation on the West Coast is extending and increasing the potential supplies of copra in the market, the exportable surplus seems to be dwindling. So far as this tendency represents a larger internal demand for crushing purposes, it is to India's benefit, but it is not reflected in any larger shipments of coconut oil.

TABLE No. 106.—Exports of copra and coconut oil contrasted from 1913-14 to 1922-23 with index number.

Year.	COPRA.		COCONUT OIL.	
	Tons.	Index Nos.	Gallons.	Index Nos.
1913-14 . . . . .	38,191	100	1,081,477	100
1914-15 . . . . .	31,846	83	1,824,539	167
1915-16 . . . . .	15,878	41	2,044,894	187
1916-17 . . . . .	26,806	70	2,061,314	188
1917-18 . . . . .	5,873	15	3,173,801	291
1918-19 . . . . .	461	1	7,198,407	660
1919-20 . . . . .	10,641	28	4,753,780	436
1920-21 . . . . .	2,736	7	1,846,046	169
1921-22 . . . . .	2,974	8	992,139	91
1922-23 . . . . .	13,949	37	834,243	76

In the five years preceding the war Germany took nearly 73 per cent of the exports of copra and only 33 per cent of the exports of coconut oil. The copra was crushed at Hamburg, and in 1913 alone 30,236 metric tons of oil were shipped thence to the United Kingdom for conversion into margarine. The copra trade was therefore hard hit by the elimination of Germany as a customer, but the shipping season of 1914-15 was over before war was declared. France developed a limited demand, but the United Kingdom took little until 1919-20. In the following table are shown the quantities exported in recent years with the share of the principal ports.

TABLE No. 107.—Exports of copra in 1913-14 and from 1918-19 onwards showing the share of the principal ports.

Ports.	1913-14	1918-19.	1919-20.	1920-21.	21-22.		1922-23.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Madras Presi- dency—							
Cochin . . . . .	27,225	..	6,892	262	1,334	6,289	
Calicut . . . . .	4,289	1	608	1,978	397	1,890	
Badagara . . . . .	4,134	..	..	40	905	4,031	
Tellicherry . . . . .	2,438	..	43	201	125	1,546	
Bombay Presi- dency—							
Bombay . . . . .	85	322	3,231	139	186	78	
TOTAL MADRAS AND BOMBAY . . . . .	38,171	323	10,574	2,620	2,947	13,534	
TOTAL ALL INDIA . . . . .	38,191	451	10,641	2,736	2,974	13,949	

Exporters of copra experienced a serious set-back in 1918-19, owing to the difficulty of securing freight for such a bulky and unpopular cargo, and the only foreign shipment in the year from Madras ports was a paltry 13 cwts. to the Bahrein Islands, while the total for all India did not exceed 450 tons. In 1920-21 and the following year the falling off is attributed to the high prices prevailing locally for copra, but in 1922-23 Germany was an active buyer as well as the United Kingdom and a considerable, if temporary, recovery was recorded.

The unit of export is uniformly the bag of 126 lbs., the copra being sliced into small pieces and so packed, but as it loses some weight in transit (about 2 to 3 per cent) between India and Europe, payments are usually made on the basis of delivered weights. The unit of sale in Cochin is the candy of 600 lbs., and in Madras the Dutch candy of 672 lbs. Copra is practically all sold forward on *c. i. f.* contracts either to the United Kingdom or to Continental ports, but the majority of these contracts are put through in the commercial sale rooms in Mincing Lane, as the business is financed from London and worked almost entirely through London brokers. The season for shipment lasts from October to May in Cochin and from December to May in other ports, inconsiderable shipments being also made from Madras and Cocanada.

Malabar copra has for years commanded a higher price than any other in the world's markets, because it is wholly sun-dried, which is said to secure a higher oil content as well as a better colour, whereas elsewhere, as in Ceylon, owing to the uncertainty of the weather, much of the copra is dried artificially under cover over grills or in kilns or hot-air rotary machines.

Copra has a very high oil content (from 60 to 70 per cent) and the resultant product is not only in great demand for the manufacture of edible oils and fats but also in connection with soap making. The best Malabar copra yields a higher percentage of oil than that of Ceylon, West Africa or the Philippines. Before kerosene came into general use coconut oil was India's principal illuminant. It is still widely employed for toilet purposes. The export trade before the war was practically confined to the Malabar littoral, where the oil, though extracted for the most part in *chekkus* or primitive country mills of the pestle and mortar type, was of excellent quality and under the trade name of *Cochin oil* commanded a premium of 15 to 20 per cent in the world's markets as against *Ceylon oil*.

There are now a number of power-driven concerns, known as 'chuck'\* mills in Cochin, Calicut and Alleppey working on practically the same principle, except that the mortar and not the pestle revolves, driven by small oil engines. While the yield of hot pressed oil is higher, cold pressed oil is of a better colour. The best Cochin oil, which is filtered before shipment, is so clear as to be scarcely distinguishable from water. The obstacle to shipment by tank steamer is the fact that coconut oil solidifies at about 70° F. The best oil from Cochin is shipped in casks of white cedar (*dyscozylon*

\* A corruption of the Malayalam word 'chekku' meaning 'a small mill' mentioned above.

*malabaricum*) weighing 15 cwts nett which added not less than Rs. 30 per ton to the cost in pre-war times, but other units like pipes of 15 and 20 cwts. nett, hogsheads of 4 cwts. and two-tin cases, containing 68 to 74 lbs. of oil, are not unknown. The unit of sale in Cochin is the candy of 600 lbs. but the price usually quoted for export is so much per ton *f. o. b.* Cochin, the ton being according to the Cochin tonnage scale of 14 cwts. The unit of shipment in Calcutta is the 5 gallon drum, or cases and half cases containing 17 and 8½ gallons of oil, respectively. In the following table the exports and the principal destinations in the last pre-war year are contrasted with those for 1922-23.

TABLE No. 108.—Exports of coconut oil (quantity and value) and the principal destinations in 1913-14 and 1922-23.

Destinations.	1913-14.		1922-23.	
	Quantity.	Value.	Quantity.	Value.
	Gallons.	£	Gallons.	£
United Kingdom . . . . .	223,756	31,759	354,050	57,079
United States of America . . . . .	447,064	63,070	190,585	31,359
British Possessions . . . . .	30,132	4,647	63,450	11,019
Germany . . . . .	163,632	22,857	58,921	8,061
Holland . . . . .	29,285	4,116	33,611	5,807
Belgium . . . . .	43,571	6,212	24,006	3,667
Sweden . . . . .	119,541	16,996	18,061	2,608
France . . . . .	8,492	1,214	..	..
Italy . . . . .	5,566	795	..	..
Other countries . . . . .	19,840	3,367	91,609	15,103
TOTAL . . . . .	1,091,477	155,073	834,243	134,733

Germany always took more copra than oil, against which there was a tariff wall, and the bulk of the *poonac* (coconut cake). Coco-butter of good quality is being manufactured on a commercial scale at Pondicherry and at Ernakulam, and there is an increasing demand for the oil in connection with the numerous small factories, making soap by the cold process, which are springing up all over southern India.

The trade has always centred in Cochin. Out of 1,091,477 gallons exported from India in 1913-14, the share of this port was 1,056,532 gallons. (The exports from Ceylon

**Ports of shipment.** in 1913 exceeded 6½ million gallons and in 1914, 6 million gallons.) A feature of the last two years of the war was a marked increase in the exports from Calcutta, where the mills to a great extent depend upon Ceylon for their supplies of copra. Whereas in 1915-16 and 1916-17 the exports of oil from Calcutta were in the neighbourhood of 23,000 gallons only, in 1917-18 the total rose to nearly 471,000 gallons and in 1918-19 to 2,500,000 out of an all India total of 7,200,000 gallons. In the following year Calcutta accounted for 983,000 gallons, out of 4,754,000. The figures for the last three years, 11,000 gallons in 1920-21; 13,000 gallons in 1921-22; and 15,000 gallons in 1922-23 tell their own story.

The falling off in coconut oil shipments is reflected in smaller importations of copra from Ceylon. Whereas in 1919-20, 17,212 tons were imported into Calcutta, the figures for subsequent years are:— 1920-21, 2,546 tons; 1921-22, 655 tons; and 1922-23, 64 tons only. In pre-war days the consumption of coconut oil in Bengal was greater than the provincial production and statistical records reveal that there had previously been from time to time imports on a considerable scale into Calcutta from Ceylon, e.g. in 1906-07 when 731,281 gallons were received.

The exports of coconut oil from all Madras ports to foreign destinations declined in the quinquennium before the war. Whereas nearly 2,000,000 gallons went out in 1910-11, the total

Exports for Madras  
Presidency.

for 1913-14 was only 1,091,000 gallons. The same conditions, however, which operated

generally in respect of oilseeds, led to increasing quantities going forward during the war, and also to a larger proportion of the shipments of Cochin oil being made from other than Madras ports. Foreign shipments have declined in the last two years, but owing to larger coastwise despatches the total volume of trade is still above pre-war levels. The following table gives a conspectus of the trade of the Madras Presidency in the oil during the last ten years. For conversion purposes 240 gallons may be taken as the equivalent of one ton.

TABLE No. 109.—Foreign and coastwise exports (quantities and values) of coconut oil from the Madras Presidency during the last ten years

Year.	FOREIGN.		COASTWISE.		TOTAL.	
	Quantity in thousands of gallons.	Value	Quantity in thousands of gallons.	Value.	Quantity in thousands of gallons.	Value.
1913-14	1,060	£ 149,800	3,386	£ 474,900	4,446	£ 624,800
1914-15	1,784	239,700	3,368	380,800	5,152	620,500
1915-16	2,016	269,100	2,729	285,400	4,745	542,500
1916-17	2,019	283,500	2,398	296,000	4,417	579,500
1917-18	2,490	308,300	2,790	272,800	5,280	582,100
1918-19	3,885	464,640	3,085	392,800	6,970	857,500
1919-20	3,012	573,000	2,756	491,100	5,768	1,064,100
1920-21	1,794	394,800	3,003	594,700	4,797	989,300
1921-22	956	170,800	5,333	836,800	6,289	1,007,400
1922-23	806	129,300	4,983	703,600	5,789	832,900

The coastwise trade, which has expanded during the last ten years, is mostly directed to Calcutta, Karachi, Bombay and Rangoon. In 1918-19, there were considerable despatches of oil by rail to Calcutta and Bombay for foreign shipment.

The residue of the chuck mills mixed with a little gum arabic is *poonac* or coconut cake, valuable both as a food stuff for cattle and as a manure. Most of the cake remains in the country, but before the war there were inconsiderable exports to Germany. At that time the value of *poonac* as a cattle food was scarcely known in England, but since the war what little has been exported from India has found its way into the United Kingdom, Germany, Belgium and France.

Poonac.

TABLE No. 110.—Exports of coconut cake from 1913-14 onwards.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	84,166	26,965
1914-15 . . . . .	60,958	18,543
1915-16 . . . . .	1,417	382
1916-17 . . . . .	Nil.	Nil.
1917-18 . . . . .	1,152	353
1918-19 . . . . .	22,006	5,428
1919-20 . . . . .	75,420	29,747
1920-21 . . . . .	60	21
1921-22 . . . . .	66,920	36,722
1922-23 . . . . .	18,840	8,652

The chief ports of export are Cochin and Calicut. The unit of sale on the West Coast is the candy of 560 or 600 lbs., and shipment is made in bundles, each containing 168 lbs. nett or in bags of 1 cwt. nett.

The following table shews the exports of coconut palm products from India in 1913-14 and 1922-23, respectively. There are in addition considerable exports from the Travancore port of Alleppey, which during the war, were largely diverted to Tuticorin and Cochin.

The trade in desiccated coconut which has attained to such considerable dimensions in Ceylon has never yet been successfully exploited in India.

TABLE No. 111.—Quantity and value of coconut products exported from British India in 1913-14 and 1922-23.

Products.	1913-14.		1922-23.	
	Quantity.	Value.	Quantity.	Value.
		£		£
Coconuts . . . . . No.	344,111	1,517	466,171	2,494
Coir fibre . . . . . Cwts.	14,812	11,449	9,800	7,654
Coir manufactures . . . . . "	772,262	592,741	662,320	728,450
Cordage and rope . . . . . "	60,420	70,189	50,223	79,587
Copra . . . . . Tons	38,191	1,039,826	13,949	336,963
Coconut cake (poonac) . . . . . Cwts.	84,166	26,965	18,840	8,652
Coconut oil . . . . . Tons	4,548	155,073	3,476	134,733
<b>TOTAL VALUE . . . . .</b>	<b>..</b>	<b>1,897,760</b>	<b>..</b>	<b>1,298,733</b>

#### Mowra Seed.

Mowra, mowhra mowa or mahua seed is obtained from three species of *bassia*, viz., *latifolia*, a deciduous tree, widely distributed in the Central Provinces, Chota Nagpur and Western

India, the bulk of the seeds, exported from Bombay and from Calcutta belonging to this variety, *longifolia* in Hyderabad and Madras, and *butyracea*, grown in the sub-Himalayan tracts. Two grades of seed are recognised, known as *first* and *second* quality respectively, the former consisting of brown, yellowish seeds with a small percentage of damaged seeds, while the seeds in the latter are dark brown with anything up to 20 per cent damaged and slightly

damaged grains. The crop usually comes into sight in the month of June and the market is brisk until September.

Between 1907-08 and 1912-13 the exports of mowra seed from India averaged about 27,000 tons but the trade was marked by great variations. In 1913-14, 33,000 tons were shipped,

**Exports.** of which Germany took 85 per cent for soap and candle manufacture and Belgium accounted for most of the balance. In 1914-15 the crop is said to have been indifferent, and with Germany out of the market, only 7,500 tons were exported, of which over 5,000 tons went to the United Kingdom, which had not hitherto taken any interest in these seeds. Shipments in 1915-16 and 1916-17 averaged 4,200 tons only and practically nothing was shipped in 1917-18 or 1918-19. 5,000 tons were exported in 1920-21, but only 1,000 in the following year.

Almost 60 per cent of the shipments in 1922-23 went to Germany and Belgium and France shared the balance.

TABLE No. 112.—*Export of mowra seed from India—quantities and values and principal destinations in 1913-14 and 1922-23.*

Principal destinations.	1913-14.		1922-23.	
	Quantity.	Value.	Quantity.	Value.
	Tons	£	Tons	£
Germany . . . . .	28,384	309,791	14,323	142,430
Belgium . . . . .	4,439	48,696	5,060	46,846
France . . . . .	425	4,696	4,761	48,986
Holland . . . . .	50	533	..	..
British Possessions . . . . .	1	17	..	..
TOTAL (INCLUDING "OTHER COUNTRIES.")	35,299	363,634	24,149	236,308

Before the war nearly 90 per cent of the shipments went from Bombay, chiefly to Hamburg and Antwerp, the balance being contributed by Madras and Calcutta in the order named. The unit of sale in Bombay is the cwt. and shipment is made in bags of 140 to 154 lbs. nett, but quotations for export are made on the ton of 2,240 lbs. nett. c.i.f.

A country spirit is distilled from the flowers of the mowra, which are also a favourite article of food, particularly in the Central Provinces.

The seeds contain a large quantity of edible oil, which from the ease with which it solidifies is often called 'mahua' butter.' It is largely used all over India as a *ghi* substitute or adulterant.

#### Poppy Seed.

While it is doubtful if the poppy plant would be cultivated in India were it not for the opium derivable from it, poppy seed at the same time forms an important secondary crop. The

**Area and production.** decline in the area under poppy will be discussed in detail in the article on opium.\* 99 per cent of the whole acreage is in the United Provinces. The average yield per acre in the United Provinces is about 4 cwts. and on the assumption that the acreage now

\* See page 223.

under cultivation is not diminished, the yield of poppy seed in India would amount to 37,800 tons annually. Three qualities of seed are recognised, *white*, *blue* and *red*, but the two latter are very difficult to obtain. The seeds come on to the market generally in April and most of the business for the year is concluded by July. A great deal of poppy seed is consumed as food and the oil is widely used for culinary purposes, while poppy cake is relished by the poorer classes and by cattle alike.

Export figures not unnaturally have been on the decline since 1911-12 when 34,900 tons were exported, equivalent to about 16 per cent of the estimated then available crop.

**Exports.** France, where the oil is extracted by the cold process for table purposes and as an ingredient in paints, has always taken the bulk of the crop, Belgium and Germany being the only other countries at any time interested in the trade. As in the case of other seeds dependent upon a Continental demand there was a very marked decline in the volume of exports while the war lasted. The percentage of oil content by weight is 30. Seeds, the capsules of which have not been scarified for opium, give a higher yield than those which have. No figures are available regarding the exports of poppy oil from India which is generally extracted by the cold process, or of the residual cake.

TABLE No. 113.—Exports of poppy seed from India and share of the chief importing countries.

Principal countries of destination.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
France . . . . .	10,700	2,534	7,187	4,052	5,461	3,494
Belgium . . . . .	4,800	..	54	..	217	100
Germany . . . . .	3,300	..	..	..	433	170
United Kingdom . . . . .	..	..	178	11	48	50
TOTAL { QUANTITY	18,980	2,695	7,735	4,302	6,482	4,458
VALUE £	310,589	50,336	245,605	108,498	138,126	90,825

The bulk of the shipments went from Bombay and the balance from Calcutta, the unit of shipment at the former port being 140, 154 and 168 lbs. gross and at the latter of 155 lbs. nett, packed in single heavy C. bags. Sales are made per cwt. in Bombay and per bazaar maund in Calcutta but quotations for export are generally per ton of 2,240 lbs. nett, *c.i.f.*

#### Niger Seed.

Niger seed is obtained from *guizota abyssinica*, a native of tropical Africa which, since its acclimatisation in India, has become the chief source of European supplies. It has not and

**Area and production.** is never likely to be an article of first rate importance, as sesame, which is grown in the same localities, gives a better return per acre. It is a spring crop, largely sown mixed, the chief producing areas being Chota Nagpur, the Central Provinces, the Deccan and north-eastern Madras. From its resemblance to sesame it is sometimes called *kala-til* (or black sesame). The normal yield per acre may

be taken at 300 lbs. and the percentage of oil to seed by weight as 35. No separate statistics of production or cultivation are available. Most of the seed is locally crushed and used for cooking, anointing the body and mixing with sesame and other more valuable oils. The relative cheapness of the oil encourages its use as an adulterant.

The history of the export trade in recent years is one of continual decline. Shipments fell from 10,000 tons in 1911-12 to 5,000 in the following year. In 1913-14 there was again a slight shrinkage and in 1915-16 the total was no more than 589 tons. At one time half the exports used to go to the United Kingdom but in the years immediately preceding the war an increasing share of the trade was taken by Germany and Austria-Hungary. Considerable quantities were also shipped to France, to which after several years abstinence the bulk of the shipments of 1922-23 were made. The following table shews the exports of niger seed according to destinations in 1913-14 and from 1918-19 onwards.

TABLE No. 114.—*Distribution of the trade in niger seed among principal importing countries in 1913-14 and from 1918-19 onwards.*

Destinations.	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	
Germany . . . . .	2,029	..	..	..	65	65	
France . . . . .	1,047	..	20	..	..	955	
Austria . . . . .	..	..	..	..	..	..	
Hungary . . . . .	586	..	..	..	..	..	
United Kingdom . . . . .	367	10	386	45	279	191	
Italy . . . . .	50	..	..	..	..	..	
Other Countries . . . . .	48	14	10	10	10	63	
TOTAL	QUANTITY	4,107	24	416	55	354	1,274
	VALUE £	42,926	492	10,855	1,039	6,304	18,926

The three ports chiefly interested in the exports are Bombay, Bimlipatam and Vizagapatam. In the last pre-war year 2,023 tons went from Bombay and 2,071 tons from Madras ports.

The seed is chiefly shipped from Bimlipatam and Vizagapatam in single gunnies containing 164 lbs. nett or 170 lbs. The usual grade of quality is fair average of season, Europe cleaned.  
**Unit of sale and shipment.** The unit of sale in the Bombay market is the candy of 20 Bombay maunds and shipment is effected in bags weighing 182 lbs. The London quotations are generally per quarter of 376 lbs. in Madras, but in Bombay it is the ton of 2,240 lbs. nett *c.i.f.*

#### Coriander.

Coriander (*coriandrum sativum*) is cultivated all over India on account of its fruit and leaves. It is sown at different seasons in different provinces, frequently as a mixed crop, and perhaps on that account no estimate of the area under the plant or the annual outturn seems to have been attempted. The fruits commonly but erroneously called

seeds yield a spice and a volatile oil, while the leaves, are eaten as a vegetable and form a common ingredient in curries. The exports during the last ten years are shewn in the following table. The volume of trade though it has attained no great dimensions is, it will be seen, remarkably steady in spite of the upward trend of prices. The season generally runs from January to July.

TABLE No. 115.—Quantity and value of coriander exported from India from 1913-14 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	4,777	39,099
1914-15 . . . . .	4,203	46,327
1915-16 . . . . .	4,505	70,953
1916-17 . . . . .	4,244	68,541
1917-18 . . . . .	5,821	80,011
1918-19 . . . . .	4,839	65,347
1919-20 . . . . .	4,815	63,151
1920-21 . . . . .	4,302	71,570
1921-22 . . . . .	4,429	82,388
1922-23 . . . . .	5,660	115,584

Foreign markets for Indian seeds were restricted at any rate before the war because their oil content is much lower than that of the coriander grown in Eastern Europe. The bulk of the traffic is from Tuticorin and Negapatam though there are shipments also from Calcutta and Bombay, the exports being mainly directed to Ceylon and the Straits Settlements. Mauritius takes about 100 tons annually and in 1917-18 some 700 tons went to the United Kingdom.

In Madras the unit of sale is generally the candy of 500 lbs. and shipment is made in gunnies weighing 100 or 164 lbs. while in Bombay coriander is sold per candy of 11 Bombay maunds and shipped in bags of 100 lbs. The unit of sale in Calcutta is the bazaar maund and the seed is shipped in bags weighing 164 lbs.

#### Cummin Seed.

Commercially there are two varieties of cummin seed distinguished in India viz., the true cummin (*cuminum cyminum*) and black cummin

*(nigella sativa)*, to which perhaps may be added another variety which, on account of its appearance and its vernacular name (*shiyah zirah*), is very often confounded with black cummin. There is good reason to believe that none of these varieties are indigenous, the original home of the plant being Egypt and the Mediterranean littoral and islands. True cummin is grown chiefly in the United Provinces and the Punjab but it is found in almost every province, the chief trade centres being Jubbulpore, Gujarat and Rutlam. Black cummin is not so widely distributed.

No statistics of acreage or production are available in respect of either variety, but the internal consumption of both as a spice in confectionery and curries is considerable and over

**Exports.** 20,000 cwts. of true cummin and 2,000 cwts. of the black variety are exported annually, chiefly to Ceylon, the Straits Settlements and the Arabian and East African coasts. Practically nothing goes to the United Kingdom or to the Continent because of the extensive cultivation in Europe of the caraway (*carum carui*). The chief ports of export are Bombay and Calcutta.

*Shiyah zirah* (*carum indicum*) grows throughout north-western India from Kashmir to the United Provinces and large quantities of seeds are collected by hill tribes and brought

**Shiyah zirah.** to the towns for sale to *mahajans*. It is considered superior in taste and fragrance to ordinary cummin seed and so much disappears in internal consumption that all attempts to export the seed on a considerable scale have hitherto proved abortive.

#### Ajwan Seed.

*Ajwan* seed, the source of the valuable antiseptic *thymol*, is obtained from *carum copticum*, a herbaceous plant cultivated all over India as a *rabi* crop, belonging to the same genus as caraway. Two qualities of seed are generally recognised on the market, known respectively to the trade as *Indore* and *Kurnool*, of which the latter is regarded as superior. No statistics of acreage or production are available but the internal consumption is fairly large as the aromatic fruits are much in request for admixture in curries, etc., and in *pan supari*. A liquid obtained by distillation from the seeds known as *omam water* is commonly retailed in every considerable town up-country as well as an essential oil.

The quantities and values of *ajwan* seed, exported from India during the last ten years, are shewn in the following table. The export

**Exports.** trade in this seed which had scarcely reached 10,000 cwts before the war, has in the last two years exceeded 20,000 cwts.

TABLE No. 116.—Quantity and value of *Ajwan* seed exported from 1913-14 onwards.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	9,784	2,983
1914-15 . . . . .	7,368	2,736
1915-16 . . . . .	13,062	4,871
1916-17 . . . . .	11,093	4,304
1917-18 . . . . .	3,990	2,765
1918-19 . . . . .	1,917	2,102
1919-20 . . . . .	540	623
1920-21 . . . . .	9,640	6,902
1921-22 . . . . .	21,680	17,098
1922-23 . . . . .	27,320	19,857

The bulk of the exports goes from Bombay and the balance

from Calcutta, shipments from Madras being negligible. The principal recipients in pre-war times were Germany, whose distilleries absorbed 80 per cent of the shipments from India, the United States of America and, to a limited extent, Ceylon and the Straits. Little was directed to the United Kingdom, except during the war. The principal customers in the last two years have been Germany and the United States of America.

The unit of shipment is the single B twill bag of 140 lbs., nett and quotations are generally based on the ton of 2,240 l<sup>1</sup> s. nett, *c. i. f.*

Ajwan oil is a specific in cholera and colic. In the process of distillation a crystalline substance separates itself and settles on the surface which is known commercially as *thymol*, which

**Thymol.** is a valuable antiseptic. It is prepared on a fairly extensive scale in Central India and sold locally as *ajwan-ka-phul* or *flowers of ajwan*. The percentage of oil in the seed is low and usually does not exceed 3 to 4. The amount of *thymol* extracted from a given quantity of seed varies from 20 to 30 per cent of the yield of oil. High grade thymol crystals comparable with those manufactured in pre-war years in Germany were during the war successfully manufactured by two firms in India. Statistics of export previous to June 1917 are not available, but the quantity exported from Calcutta between June 1917 and June 1919 aggregated 10,500 lbs. valued at £16,000. The principal destinations were the United States of America and the United Kingdom. Since then only a single shipment of 224 lbs. valued at £224, in February 1922 has been reported.

One of the bye-products obtained from the distillation of ajwan is *thymene* which is a cheap scent utilised in the manufacture of soap.

**Bye-products.** The demand in India for this oil is very limited, but in pre-war years German distillers made a profit out of the sale of thymene and the spent seed which enabled them to sell thymol itself at a price which barely covered the cost of the seed and the expenses of distillation.

The spent seed makes an excellent cattle food, but so far it has not found much favour among Indian agriculturalists.

#### **Kardi (Safflower) Seed.**

The seeds of the safflower plant (*carthamus tinctorius*), the flowers of which are utilised for the extraction of safflower dye, yield, when crushed, the *kusum* or *carthamus* oil of trade. In some localities, *e.g.*, the Deccan, distinction is made between two species, one sown essentially for oil and the other for dye. The former is extensively produced in Bombay: indeed, at the beginning of the century it was regarded as perhaps the most important oilseed grown in that Presidency, the chief centres of cultivation being the alluvial loams of Ahmednagar, Poona, Satara and Bijapur. It is also widely distributed in the Central Provinces and the Madras Presidency. The areas cultivated with the dye-yielding variety have shrunk in recent years, owing to the competition of chemical substitutes. Safflower being chiefly grown as subsidiary to some other crop, no statistics of area or production of seed are available. Exports of this seed have only recently been separately

recorded. The Madras trade which amounted only to 25 tons, valued at £250 in 1921-22, rose to 2,300 tons, valued at £23,000 in 1922-23.

The unit of shipment is the single B twill bag, weighing 180 lbs. nett and quotations are generally made on the basis of the ton of 2,240 lbs. nett. *c. i. f.* Normally the chief port of export of the seed is Bombay and the principal destination the United Kingdom.

The oil is extracted in two ways (1) by cold-dry pressure either before or after the seeds have been husked, and (2) by crude distillation in two earthen pots, one above the other, the percentage of oil in the seed being about 25. The cold drawn oil is of a clear straw colour and it is largely used for culinary purposes, as an adulterant of *ghi* or tilseed oil and as an illuminant, while the hot drawn oil is converted into *roghan*, chiefly employed as dubbin for greasing well-ropes, leather etc. The seeds are excellent for fattening poultry, but the cake is more highly valued as manure than as a cattle feed.

#### **Carthamus oil.**

### **TEA.**

The trade in tea (the leaf of a species of *camellia*) represents a considerable proportion of the export trade of British India: and in 1922-23 amounted to 288 million lbs. valued at £14½ millions equivalent to 7 per cent of the total exports, an individual total only exceeded by cotton, jute, food-grains and oil seeds.

The world demand for tea has been estimated as in the neighbourhood of 725 million lbs. annually, and between 40 and 50 per cent of this total is supplied by India.

Though the China crop is difficult to estimate with any approach to accuracy, India is now probably the largest tea producer in the world. In 1917 China exported only 150 million lbs. or considerably less than half the quantity exported from India in the same twelve months, while the exports from Ceylon in 1919 were 206 million lbs.

The latest statistics available shew that the despatches to foreign destinations of tea from Ceylon, China and Java are in the neighbourhood of 170, 73 and 81 million lbs. respectively, annually.

In the latter half of the eighteenth century, the most profitable trade of the East India Company with the United Kingdom was in tea from China, of which it had the monopoly, though the exorbitant import duty encouraged a great deal of smuggling. In 1787 over 20,000,000 lbs. were shipped and in the following year the suggestion emanated from Kew that experimental cultivation should be made in India, so that in the event of trouble with the Chinese authorities an alternative source of supply might be available. Little however was done until 1834, when Lord William Bentinck, the then Governor General, unaware, that the tea-plant was indigenous in Assam, warmly took up the matter, and appointed officers to proceed to China and collect tea seed and expert Chinese labour. Three missions in all were sent to China and much money unprofitably spent on exploiting imported in preference to indigenous seed. The first samples of teas grown on the Government plantations in Assam were sent to England in 1838 and the first Calcutta sale held three years later. It was not until 1852 that it was established that

Indian tea was in a position to compete on the London market with China tea, but thereafter progress was so rapid that the Government's direct connection ceased in 1865. In 1868 the exports totalled 8,000,000 lbs. The first private company to be formed was the Assam Company in 1839 with a capital of £500,000, which purchased the Government plantations at Sibsagar in the following year. Tea was experimentally started in the Darjeeling district in 1840 and in the same year introduced into the Chittagong district. The first garden in Cachar was opened in 1855. The industry in the Terai started in the year 1862 and in the Western Duars, where the climate and soil have proved extremely suitable for tea cultivation, twelve years later. The early years of tea planting were marked by many failures, and when in 1853 the tide turned there was such reckless extension of tea cultivation and speculation in gardens, that another severe crisis occurred in 1866. The chief elements of weakness were then eliminated and subsequently the history of the tea industry in Assam and Bengal has been one of almost uninterrupted prosperity. In Northern India tea is cultivated only on a small scale, in the United Provinces in the districts of Dehra Dun, Almora and Kumaon Garhwal, in Nepal and in the Chota Nagpur district of Bihar and Orissa. In the Punjab it is to be found in the Kangra valley, the States of Mandi and Sirmur and to a very small extent in the Simla Hills.

Tea has also been profitably cultivated in Southern India since 1853, chiefly in the Wynaad, the Nilgiris, and latterly in the Anamalais and the high range of Travancore, and the depreciation in coffee values in the early part of the present century has led to the conversion of considerable areas, formerly under that plant, into tea gardens.

The production of tea in Burma is insignificant, and returns from that area have since 1920, when the acreage was less than 2000, been discontinued. The tea grown in the Shan States is chiefly used for making *letpet* or pickled tea, which is eaten as a condiment and not drunk as a decoction.

Most of the more important gardens in north-east India are managed and financed by Calcutta agency firms, and the same tendency is extending in Southern India where the majority of estates used, until recently, to be privately owned. Every garden of any importance has its own factory where tea is prepared for the market, as it is essential that the various processes should be carried through immediately after the leaf has been plucked. The better organised factories are elaborately equipped with highly specialised plant and are under the supervision of expert tea makers.

The object of tea cultivation being to secure the maximum quantity of leaf of the best liquoring quality, the bushes are periodically pruned

**Method of cultivation.** to ensure constant and plentiful 'flushes,' which is the term applied to the young tender shoots, which are hand plucked, chiefly by women and children.

The following table shews the area under tea (both black and green) in each province and the production in lbs. in the calendar year 1922. Black tea accounts for over 306,000,000 million lbs.

TABLE No. 117.—Area and production of tea according to provinces in 1922.

Provinces.	Area.	Production.
	Acres.	Lbs.
Assam . . . . .	412,499	198,924,824
Bengal . . . . .	180,378	71,720,740
Travancore . . . . .	48,308	22,307,431
Madras . . . . .	43,602	14,240,322
Punjab . . . . .	9,762	1,548,418
United Provinces . . . . .	6,015	1,542,351
Tripura State (Bengal) . . . . .	5,053	114,183
Bihar and Orissa . . . . .	2,116	200,163
<b>TOTAL</b> . . . . .	<b>707,733</b>	<b>310,598,442</b>

Of the above total of 707,000 acres, 653,000 acres were reported to have been plucked, as against 637,000 acres in the preceding year.

Evidence of the prosperity enjoyed by the tea industry during the war is furnished by the extension of gardens in the chief tea-producing districts. In Assam the area under tea has increased since 1914 by 43,000 acres, in Bengal by 32,000 acres, in Madras by over 21,500 and in Travancore by 13,500.

Tea cultivation postulates a warm, sub-tropical humid climate, and a well-distributed rainfall of not less than 60 inches annually. In India the tea plant is raised not from cuttings or layers but from seed, and the bushes, which are not allowed to grow more than three feet high and trained to give a good spread of plucking surface, are in full bearing by the sixth or eighth year. The average yield from Indian tea gardens per acre plucked has increased in the last thirty five years from 334 to 475 lbs. The highest production in 1922 was in Madura (Madras), namely, 806 lbs. per acre, and the lowest in Garhwal (United Provinces), namely, 13 lbs.

Out of 4,278 tea-gardens, returns were furnished in 1922 by planters of area and production in all but 47, 44 of these being in Southern India.

The pluckings which consist of the buds at the tip of the new shoots and two or three leaves below them, are withered in the factory and then passed through the rolling machines.

After roll breaking and eradication of the coarse leaves by sifting, the tea is spread out on glass or wooden tables or mats with free access to the air to oxidise or ferment. When this has proceeded far enough the leaf is fired and dried and the black tea resulting is graded, bulked and packed in lead lined chests of about 100 lbs each, soldered up and sent to the port for shipment.

The perfection of machinery has made all these processes almost automatic. Every tea estate or group of estates has a factory attached to it where suitable machinery is installed. After firing, the leaf is graded, the principal grades of commercial tea being Flowery or Broken Orange Pekoe, Orange Pekoe, Broken Pekoe, Pekoe, Pekoe Souchong, Fannings and Dust. These names are derived from China. When only the bud and the two young leaves are taken, Flowery Orange

Pekoe is the bud, Orange Pekoe, the tenderer leaf and Pekoe the second leaf. Pekoe Souchong is from a third leaf when a bush is medium plucked and coarse pluckings yield inferior teas known as Souchongs and Congous. But the commercial names have no longer any relationship to particular leaves. The broken leaf of each grade generally yields a stronger tea than the grade itself and consequently commands higher prices. The bulk of the tea produced in India is black tea.

During 1922 only 4.46 million lbs. of green tea were manufactured in British India. It is not necessary to comment at length on the stages of manufacture beyond stating that the object is to prevent the possibility of fermentation, and that instead of being withered the pluckings are steamed. 54 per cent of the green tea produced in India in 1922 came from Northern India, more than half the quantity being from the Kangra Valley (Punjab), and the bulk of the balance from the Surma Valley (Assam), Travancore, and the Nilgiris. The principal leaf grades are Young Hyson, corresponding to Orange Pekoe, Hyson No. 1 to Pekoe, Hyson No. 2 to Pekoe Souchong, Gunpowder, Twankay, Fannings and Dust.

Small quantities of brick tea are made in the Darjeeling and Kumaon divisions for the Tibetan and Bhutan markets, but practically the trade has no commercial value. There was however a considerable trade in 'dust' tea to the Chinese ports of Hankow and Shanghai, where it was manufactured into brick tea for the Russian market. The pre-war average was about 8,000,000 lbs. annually, and the war average over 6,000,000 lbs. The figures for the last three years are 2,700, 15,140 and 6,320 lbs. respectively only.

As regards the labour force employed on the tea gardens, the most recent report on the production of tea in India gives the total as 751,800 in 1922, 701,700 being permanently and 50,100 temporarily employed equivalent roughly to one cooly per acre of area under cultivation. Of the permanent employees contributing to the total above given, 492,300 are in Assam and 131,400 in Bengal tea gardens. The question of labour is one of much difficulty. Speaking generally, all the important districts have to obtain their labour from considerable distances, and this involves a heavy outlay and an elaborate machinery to control recruitment. Assam has always had to contend with special difficulties in view of its remoteness from the recruiting districts in the United Provinces, the Central Provinces, Bihar and Orissa and on the East Coast. The Assam Labour and Emigration (Amendment) Act of 1915 made important changes in recruitment of labour for Assam which is regulated by the Assam Labour and Emigration Act, 1901 (VI of 1901). Recruiting by contractors has been abolished and an Assam Labour Board formed for supervision of recruiting by local agents and garden *sirdars*.

The transport of tea from the garden to the port of shipment was in the earlier days of the industry a tedious and expensive matter. The Darjeeling district was without a good cart road until 1869 and until the railway link

Transport and shipping.

between Siliguri and the Ganges was completed in 1878, a long journey had to be accomplished to the latter by country cart. But now Darjeeling tea has only to be brought from the estate to the nearest railway station, when it can be railed direct to Calcutta, while the Assam Bengal railway brings part of the produce of Assam direct to Chittagong and part is borne on the broad waters of the Brahmaputra into Calcutta by an excellent service of cargo steamers. On arrival in Calcutta, tea is warehoused at Kidderpore, where, if for auction, it is stored, bulked if necessary, lotted, sold and eventually shipped. In Southern India the position has also improved in recent years and will be even better if the projected railway from the Wynaad to the coast is built.

India has been an exporter of tea seed for some considerable number of years past and has been the means of supplying other producing countries with a superior type of plant.

**Tea seed.** Figures are available from 1895-96 but the trade shows marked fluctuations. In that year exports aggregated 3,238 cwts. and in 1897-98, 5,371 cwts. but only 601 cwts. were shipped in 1902-03. The table below shows that the trade, which had recovered by 1913-14, has since steadily declined.

TABLE No. 118.—Exports of tea seed from India from 1913-14 onwards.

Year.	Quantity.	Destinations.
	Cwts.	
1913-14	7,847	Chiefly to Java, Ceylon and Sumatra.
1914-15	4,384	" Sumatra and Ceylon.
1915-16	2,755	" Ceylon and Sumatra.
1916-17	2,757	" "
1917-18	2,336	Chiefly to Sumatra, Java and Ceylon.
1918-19	1,268	" "
1919-20	860	" "
1920-21	880	" "
1921-22	380	" "
1922-23	240	" "

Shipments to Java in the two years prior to the outbreak of war were peculiarly heavy. In the last ten years very considerable extensions have been made of the area under tea in the Dutch East Indies, to a large extent with British capital.

In a normal trade year the principal months for tea shipments are from July to December inclusive; but appreciable quantities also go forward in June, January and February. The cur-

**Month of shipment.** tailment of shipping facilities owing to tonnage scarcity altered all this even after the export trade in tea was controlled, and though the total volume of shipments during the war approximated to pre-war levels, the seasonal distribution of exports ceased to be so clearly defined.

Early in 1917 it became necessary, owing to the reservation of freight for articles of the first importance, to restrict the export of tea from India to the United Kingdom. As a consi-

**Tea control.** derable balance of the 1916-17 crop was still unshipped, prospects were gloomy, but in November 1917 the Food

Controller formulated a scheme for the purchase and shipment of 40 per cent of the Indian tea crop between November 1st, 1917, and May 31st, 1918, which was operated through a Tea Commissioner in Calcutta. So successful was this scheme that the Food Controller raised his requirements by another 25 million lbs. and ultimately took all the tea that offered to fill the available tonnage. The feature of the trade in 1917-18 was the increase in direct shipments to the United States of America, where considerable quantities of Java tea had been dumped in the previous year. The embargo, placed by the Commonwealth Government on the import into Australia of China and Java teas, encouraged larger purchases from India as well as Ceylon. Persian buyers were also strongly in evidence. In the following year the Tea Commissioner took 66 per cent of the 1918 crop including purchases on War Office account and the balance shippers were left to dispose of themselves.

All restrictions upon the export of tea to the United Kingdom were removed in March 1919, and in the year of record shipments, which followed, despatches to that destination

exceeded by 54,000,000 lbs., the total of the previous twelve months. In no year have the exports of tea from British India been so great as in 1919-20, when 382 million lbs. were sent away by sea and across the land frontier. About 15,000,000 lbs. were sent direct to Canada and the United States of America in addition to nearly three quarters of a million *via* United Kingdom ports. A reduction in army requirements accounted for smaller despatches to Mesopotamia. In 1920-21 the tea industry suffered a severe set-back. The United Kingdom market was glutted with stocks, and the high percentage of coarse pluckings, which the pooling of all grades had encouraged when shipments were under control, led to such a slump that the price of common Pekoe Souchong fell from 1s. 3d. in March 1920 to 4d. in September. The complete elimination of Russia and the difficulties of finance on a rapidly falling exchange were other disturbing factors. Good prices, however, continued to be offered for the finer qualities of tea, and strenuous efforts were made to reduce the quantity and improve the quality of pluckings during the following season. The total shipments for the year fell to 286 million lbs. The tide began to turn again in 1921-22. As a result chiefly of deliberate policy, pluckings were materially reduced and the general range of qualities unusually high, and practically the whole of a short crop had been sold by the end of February 1922 at prices sufficient to enable most gardens, in spite of the higher cost of production, to shew a profit on the year's working. This favourable position was further consolidated in the following year, the most satisfactory feature of which was the steady advance in the price of common teas. Other contributory causes were careful plucking, the absence of any great variation in the rate of exchange and a reduction in freights. The present prosperity of the industry may be illustrated by the results of the Calcutta auction sales up to the end of September 1923, the average price realized being nearly 1s. 4d. a lb. as compared with 11d. for the same period in 1922, and a fraction less than 9d. a lb. in 1921.

TABLE No. 119.—Exports of tea by sea from India in 1900-01 and every fifth year thereafter up to 1910-11, and for each of the last ten years and the share of the United Kingdom therein.

Year.	GRAND TOTAL OF EXPORTS.		EXPORTS TO THE UNITED KINGDOM	
	Quantity.	Value.	Quantity.	Value.
	Lbs.	£	Lbs.	£
1900-01 . . . . .	190,305,490	6,367,286	166,171,566	1,768,624
1905-06 . . . . .	214,223,788	5,898,402	166,591,433	4,693,464
1910-11 . . . . .	254,301,089	8,276,912	182,935,424	5,982,589
1913-14 . . . . .	289,473,591	9,963,372	209,050,771	7,232,049
1914-15 . . . . .	300,733,434	10,352,329	237,303,792	8,162,231
1915-16 . . . . .	338,470,262	13,320,715	250,290,291	9,800,735
1916-17 . . . . .	291,402,608	11,180,649	224,927,894	8,671,266
1917-18 . . . . .	359,174,232	11,781,745	266,963,616	8,636,000
1918-19 . . . . .	323,659,710	11,650,404	282,205,196	9,859,060
1919-20 . . . . .	379,165,038	13,710,031	336,885,577	12,021,895
1920-21 . . . . .	285,751,849	8,099,843	249,111,440	6,952,009
1921-22 . . . . .	313,878,149	12,148,794	268,716,705	10,744,298
1922-23 . . . . .	288,296,200	14,693,359	248,263,160	12,760,203

The above figures, it should be noted, include exports from Travancore ports, chiefly Alleppey. Supplementary details shewing the distribution of re-exports from the United Kingdom to other countries are subjoined. The loss of the Russian market and the decline in despatches to South America and South Africa account for the greater part of the difference in the 1913 and 1922 figures.

TABLE No. 120.—Quantity of Indian tea re-exported from the United Kingdom to principal foreign countries, in 1913 and from 1919 to 1922.

Countries.	1913.	1919.	1920.	1921.	1922.
Re-exported to—	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Bassia . . . . .	6,979,883	1,067,057	245,989	47,436	169,715
Denmark . . . . .	269,372	965,988	397,289	161,162	329,613
Germany . . . . .	764,954	159,712	1,171,538	1,531,654	870,915
Holland . . . . .	2,028,331	6,390,984	1,668,807	2,049,484	1,133,500
Belgium . . . . .	115,576	357,081	239,654	78,512	292,202
France . . . . .	124,649	191,335	152,025	122,312	106,333
Austria . . . . .				1,160	3,644
Hungary . . . . .	259,119	74,506	6,097	96	239
Turkey—European . . . . .	81,954	328,886	219,659	57,122	101,673
Turkey—Asiatic . . . . .	170,992	51,593	88,646	10	7,866
Portuguese East Africa . . . . .	184,743	2,105	5,177	1,994	
United States of America . . . . .	2,175,972	157,562	3,271,120	1,497,403	2,436,917
Canada . . . . .	2,262,313	519,713	3,697,489	2,845,081	3,514,624
Chile . . . . .	1,393,651	74,220	467,215	146,960	520,536
Argentine Republic . . . . .	955,949	113,999	404,743	462,520	571,884
Channel Islands . . . . .	792,082	382,582	1,089,113	1,087,290	1,342,991
Union of South Africa . . . . .	1,593,440	82,824	915,979	545,888	335,655
Newfoundland . . . . .	71,330	9,227	77,687	34,362	54,157
Other countries . . . . .	1,607,665	1,860,615	2,055,899	1,700,158	2,064,607
<b>TOTAL RE-EXPORTED</b>	<b>21,829,974</b>	<b>12,769,989</b>	<b>16,162,020</b>	<b>12,370,803</b>	<b>13,918,078</b>

There are shipments of tea from all the principal ports but 90 per cent of the trade goes from Calcutta and Chittagong, while Tuticorin, Cochin and Calicut account for 7 per cent of the remainder. No tea is grown in the Bombay Presidency but some tea is railed from Calcutta to Bombay for shipment.

TABLE NO. 121.—Share of the provinces during the last five years in the export of tea from India.

Ports.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Bengal (Calcutta and Chittagong).	279,755,290	341,146,920	250,233,059	284,085,922	258,693,771
Bombay (Bombay)	14,296,986	7,447,961	3,600,303	2,259,782	3,909,203
Sind (Karachi)	2,539,053	1,108,811	1,275,302	292,483	194,791
Madras (Tuticorin Cochin, Calicut.)	27,087,441	29,096,403	29,918,977	26,599,556	29,096,558
Burma (Rangoon)	940	8,107	5,507	6,606	9,895
TOTAL	323,659,710	378,808,202	285,033,148	313,244,349	286,904,218

The distribution of the export trade between Calcutta and Chittagong is not without interest. In the last pre-war year the ratio was about five to one and, contrary perhaps to assumptions based upon greater opportunities of freight in Calcutta, the smaller port, except in 1917-18, increased its share of the business during the years of war. Since the armistice the ratio has fluctuated between three and four to one.

TABLE NO. 122.—Shipments of tea from Calcutta and Chittagong from 1918-19 onwards.

Ports.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Million lbs.				
Calcutta	225.00	269.04	184.59	226.99	189.69
Chittagong	64.75	72.11	65.64	57.09	64.00

The trade in tea across the land frontiers of India, excluding the imports of *letpet* and some black tea from the Shan States which are really a part of Burma, is confined to brick tea entering India *via* Tibet and Nepal and Indian and foreign teas going chiefly to Afghanistan and Persia.

TABLE NO. 123.—Imports and exports of tea across the land frontiers of India.

Year.	Imports excluding <i>letpet</i> .	Exports.
	Lbs.	Lbs.
1914-15	4,319,392	2,431,296
1915-16	5,734,624	2,550,464
1916-17	6,102,768	1,539,636
1917-18	5,463,248	2,102,464
1918-19	5,902,960	3,749,088
1919-20	5,815,712	3,238,256
1920-21	6,013,392	1,873,760
1921-22	6,645,520	4,035,808
1922-23	7,186,480	6,289,248

The unit of sale is uniformly the lb. c. t. f. for London and f. o. b. for America. The unit of shipment is the chest which varies in weight from approximately 80 to 120 lbs. nett according to the fineness or coarseness of the quality packed. Fannings and dust would approach more nearly to the maximum weight while Souchong owing to the size and coarseness of its leaf would turn the scale at nearer the lower weight.

Shipments of tea from India fall into two classes; (a) consignments direct from the garden to London where they are sold by auction in Mincing Lane; (b) consignments sold at auction in Calcutta and shipped thence chiefly to what are known as 'outside' destinations, i.e., countries other than the United Kingdom. The Calcutta tea auctions commence in May and continue weekly until January or February in the following year. In the pre-war year and the last five years the following are the details, according to districts of sales at Calcutta. In 1922-23 Darjeeling teas averaged 16½d. per lb. and at the other end of the scale Cachar teas 11½d.

TABLE No. 124.—Quantity of tea (in packages) sold at the auction sales in Calcutta in 1913-14 and from 1918-19 onwards.

Principal districts.	NUMBER OF PACKAGES SOLD IN					
	1913-14.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
Assam . . .	209,686	267,816	244,248	244,280	141,453	188,887
Cachar . . .	133,540	66,334	104,974	107,027	84,639	80,384
Sylhet . . .	116,197	73,941	72,493	88,998	42,352	77,478
Duars . . .	240,169	127,848	217,559	198,602	145,883	187,881
Darjeeling . . .	85,877	34,605	56,921	43,610	31,192	37,593
Chittagong . . .	9,647	3,924	6,773	4,544	5,451	5,976
Teraí . . .	36,709	16,775	42,397	30,445	20,698	28,104
Chota Nagpur . . .	1,387	19	41	126	1,993	552
Kumaon and Kangra . . .	2,089	158	45	..	..	..
Dehra Dun . . .	9,217	1,831	2,371	134	1,253	643
Madras . . .	518	142	211	..	..	..
Nepal . . .	1,069	434	1,040	85	630	598
Other places . . .	974	765	..	..	..	..
<b>TOTAL</b>	<b>847,079</b>	<b>594,586</b>	<b>749,073</b>	<b>717,850</b>	<b>454,942</b>	<b>607,966</b>
<b>AVERAGE PRICE PER LB.</b>	<b>7½d.</b>	<b>8d.</b>	<b>8d.</b>	<b>5½d.</b>	<b>10½d.</b>	<b>13½d.</b>

These figures may be compared with those obtained in Mincing Lane in 1913-14 and the last four calendar years.

TABLE No. 125.—Quantity (in packages) and average price per lb. of Indian tea sold in London in 1913-14 and from 1920 to 1923.

Year.	No. of packages sold.	Average price per pound.
1913-14 . . . . .	1,791,451	d. 9.25
1920 . . . . .	1,097,519	14.55
1921 . . . . .	1,421,660	10.98
1922 . . . . .	1,082,688	13.90
1923 . . . . .	953,953	18.22

NOTE.—Figures relate to the period from January to August of each year from 1920.

Exports of tea were subject to a cess of  $\frac{1}{2}$  pie ( $\frac{1}{2}$  d.) per lb. imposed by the Indian Tea Cess Act (Act IX of 1903), which was introduced at the request of the Indian Tea Association to furnish funds, to advertise and stimulate the tea drinking habit, and by the appointment of agents in India and abroad to push the sales of Indian grown tea. From 1st May 1921, the rate was raised to  $\frac{1}{2}$  pie ( $\frac{1}{2}$  d.) per lb., and from the 21st April 1923, to 6 annas per 100 lbs. ( $\frac{3}{4}$  pie or  $\frac{1}{4}$  d. per lb.). Government acts in the matter purely as a revenue collecting agency, and all moneys received are placed in the hands of a non-official committee to administer. The total amount collected in 1922-23 was £48,800, as against £50,867 in 1921-22 and £24,800 in 1920-21.

In 1923 propaganda work was confined to India itself and France, but the additional funds expected from the increased rate of cess are earmarked for an advertising campaign in the United States of America on the basis of an expenditure of £40,000 yearly from October 1923.

In addition to the cess, all tea exported from India has, since the 1st March 1916, been subject to a duty of Re. 1-8-0 per 100 lbs., equivalent to about a farthing a lb. In 1922-23 this duty yielded £296,067, as against £308,400 in 1921-22.

A considerable amount of black tea is consumed in India itself, and Burma absorbs annually about 18 million lbs. of pickled tea (*letpet*), which is grown chiefly beyond her borders in the Northern Shan States.

The Indian Tea Cess Committee have made representations to all the Provincial governments to prescribe a standard for tea, but no action has so far been taken to that end, except in Bengal. An attempt has been made in the subjoined table to estimate the amount of tea available for internal consumption in India.

TABLE NO. 126.—Quantity of tea, green and black, available for consumption in India in 1913-14 and from 1918-19 onwards.

Year.	Production.	Deduct net exports to foreign countries.	Add stocks from previous year.	Deduct stock left at end of year.	Balance available for consumption.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1913-14 . . .	307,249,669	284,452,905	*1,884,500	*2,418,100	22,263,164
1918-19 . . .	380,458,975	312,012,408	†43,500,000	61,500,000	50,446,567
1919-20 . . .	377,055,639	370,372,501	61,500,000	38,376,000	29,897,138
1920-21 . . .	345,339,576	276,510,111	38,376,000	63,247,000	43,958,465
1921-22 . . .	274,263,771	304,829,523	63,247,000	2,112,500	30,568,748
1922-23 . . .	310,598,442	281,494,433	2,112,500	2,900,000	28,316,509

\* Estimated stocks at Calcutta (normal elsewhere).

† Estimated stocks at Calcutta (Kidderpore) and Chittagong (Bombay and Madras being normal) and also the amount held up at the gardens.

There has been a marked increase in tea shops not only in Calcutta, Madras and other big cities but also in the smaller towns particularly

in Southern India and in spite of higher prices, there is reason to believe that the tea drinking habit is gradually extending among all classes of Indians.

The imports of tea, black and green, into India by sea and land in 1922-23 amounted to 13,290,070 lbs. Of this 419,583 lbs. were re-

exported. In the result the figure of net imports is 12,870,487 lbs., but 7 millions representing imports from the Shan States of *letpet* can scarcely be regarded as foreign tea. India manufactures little green tea and 5 million lbs. were imported in 1922-23 chiefly from China to make good the deficiency in Northern India, where it is preferred to black tea. The balance is made up of small consignments of black tea from Ceylon and Java aggregating less than a million lbs. altogether.

The capital of joint stock companies invested in tea in India in 1922 was approximately £28 millions, chiefly in Finance. sterling companies. When teas are purchased at the local Calcutta auctions, the firms draw for their value through a bank against shipping documents. In Calcutta teas are sold for cash 10 days after purchase. Some gardens sell the whole of their production in advance.

Tea waste or refuse is the chief source commercially of caffeine. The bulk of the exports in 1922-23 was shipped to the United States and the United Kingdom.

TABLE NO. 127.—Exports of tea waste from India in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Lbs.	£
1913-14 . . . . .	3,084,288	17,907
1918-19 . . . . .	1,641,320	26,368
1919-20 . . . . .	7,911,000	98,287
1920-21 . . . . .	6,571,559	79,207
1921-22 . . . . .	3,124,848	35,705
1922-23 . . . . .	1,622,816	14,366

A number of Himalayan woods have at different times been used for making tea chests, particularly *toon* (*cedrela toona*) and *simal* (*bombax malabaricum*), but certain varieties have the reputation of tainting the tea, and others require prolonged seasoning before they can be considered suitable. Formerly Burma teak shooks were largely employed for this purpose, but by 1908-09 this trade had died out, and the tendency since has been to rely more and more upon patent tea chests from Europe. Steel chests have proved too expensive for general adoption.

The import trade in wooden tea chests was valued at £298,000 in 1911-12, of which 95 per cent came from the United Kingdom, though made largely of Russian birch and alder. During the war, until communications by the Trans-Siberian Railway were cut off, large shipments of shooks were made *via* Vladivostok, instead of, as previously, *via* the United Kingdom. The value has fluctuated from year to year

but with an upward tendency and, at the outbreak of war, had stood at £347,000: in 1915-16, at £545,000 and in 1916-17, as a result of great appreciation in prices, at £579,000. The figures for 1917-18 and 1918-19 were £628,000 and £606,500, respectively. In the following four years the values of the imports were: 1919-20, £449,000; 1920-21, £657,000; 1921-22, £382,000; and 1922-23, £413,000. The value of metal chests imported in the last pre-war year was only £2,137, in 1918-19, £173, and in 1922-23, £3,627. The chests, to save space and freight, are shipped in the form of shooks, cut to size, with clamps, etc., which are made up locally and lined with thin sheet lead. After filling they are carefully soldered and made airtight so that the tea will not absorb moisture and become mouldy.

### HIDES AND SKINS.

The term *hides* in general parlance denotes the raw, dressed or tanned skins of bullocks, cows, buffaloes, horses, camels, etc., while the term *skins* is restricted to those of calves, sheep, goats, deer and other wild animals. Statistically and commercially, however, calf skins are treated as hides. It has been calculated that in India there are about 180 million head of cattle and 87 million sheep and goats.\* The internal trade in hides is greatly affected by the seasons and, when there is any shortage of fodder or general scarcity the market is unusually brisk. Before the war the exports of raw hides and skins largely exceeded the tanned, as the following figures for 1913-14 indicate.

TABLE NO. 128.—Quantity and value of hides and skins exported in 1913-14.

Descriptions.	HIDES.		SKINS.	
	Quantity.	Value.	Quantity.	Value.
Raw . . . . .	Cwts. 1,115,747	£ 5,530,000	Cwts. 486,563	£ 2,260,000
Tanned . . . . .	174,028	1,058,000	130,593	1,758,000

It has been estimated that the internal absorption of tanned hides and skins in local manufactures was equal to the entire volume exported, making the total turn-over in hides and skins about £13 millions annually. In round figures out of every 100 hides exported, only seventeen were exported tanned, and of every 100 skins only twenty.

In the two years preceding the outbreak of war, there was a marked advance in the prices of dry and salted hides due to a world shortage and an increased demand. This advance was particularly marked in the case of buffalo hides, which appreciated by 50 per cent between 1912 and 1913. There is evidence in fact of considerable overtrading (doubtless deliberate) on the part of Germany and Austria with a consequent accumulation

\* Report of Indian Industrial Commission, Appendix D.

of stocks in Europe, while the United States market was almost base. In 1913-14 the distribution of the exports of raw hides was as indicated in the table below.

TABLE No. 129.—*Distribution of exports of raw hides in 1913-14.*

Destinations.	Quantity.	Percentage	Value.
	Cwts.		£
Germany . . . . .	388,000	35	2,044,000
Austria-Hungary . . . . .	238,000	21	1,229,000
United States of America . . . . .	155,000	14	688,000
Italy . . . . .	107,000	10	563,000
Spain . . . . .	49,000	5	296,000
United Kingdom . . . . .	42,000	3	186,000
Holland . . . . .	41,000	3·5	197,000

The declaration of hostilities caused in the first instance an accumulation of stocks in Calcutta, Agra, Cawnpore and other hide collecting centres in Northern India, enabling Madras tanners to buy at reasonable prices the finer qualities of raw hides previously shipped to the German and Austrian markets, and send large consignments of tanned 'kips' to the United Kingdom where unfortunately the market again became congested as there were not enough carriers available to work them up into commercial leather. Gradually, however, the capacity of the English tanneries was extended to deal with the increased supplies of raw hides from India, and when the Indian Munitions Board took over the control of export in June 1917, fresh openings were found in Italy and the United States of America, in spite of the difficulties of freight and finance, for considerable quantities of raw hides which formerly used to go to the Central Powers. The table below indicates the percentage share of the various importing countries of raw hides in 1918-19 and from 1920-21.

TABLE No. 130.—*Percentage share of the various importing countries of raw hides \* in 1918-19 and from 1920-21 onwards.*

Destinations.	1918-19.	Per-centage.	1920-21.	Per-centage.	1921-22.	Per-centage.	1922-23.	Per-centage.
	Cwts.		Cwts.		Cwts.		Cwts.	
United States of America . . . . .	41,463	11	63,860	17	1,200	·3	11,440	2
Germany . . . . .	..	..	73,440	20	231,840	46	211,080	44
United Kingdom . . . . .	217,780	57	62,900	17	41,100	8	22,900	5
Italy . . . . .	100,780	26	65,000	18	97,660	19	105,460	22
Austria † . . . . .	..	..	2,060	·6	240	·05	960	2
Spain . . . . .	8,560	1	35,340	10	65,000	13	48,180	10
Holland . . . . .	..	..	4,700	1	2,020	·4	1,800	·4

On a greatly reduced volume of exports, Germany's recovery of the premier position, she occupied in 1913-14, will be noticed, and the consolidation of the advance made during the war by Italy and Spain.

The following table indicates the total volume of the export trade in 1913-14 and from 1918-19 onwards with the distribution under different heads.

Exports.

\* Including calf-skins.  
† Figures prior to 1921-22 represent Austria-Hungary.

TABLE NO. 131.—Total volume of the exports of raw hides in 1913-14 and from 1918-19 onwards classified according to descriptions.

Year.	Cow hides.	Buffalo hides.	Calf-skins.	Total Quantity.	Total Value.
	Cwts.	Cwts.	Cwts.	Cwts.	£
1913-14 . . .	743,037	345,864	26,116	1,115,747	5,530,638
1918-19 . . .	283,994	78,984	18,969	381,947	1,742,733
1919-20 . . .	788,540	233,100	72,800	1,094,760	5,601,599
1920-21 . . .	281,260	66,140	21,440	368,860	1,334,363
1921-22 . . .	445,100	46,480	16,220	507,800	1,209,037
1922-23 . . .	398,040	72,880	7,920	478,960	1,451,259

The totals under the head cow hides are inflated somewhat by the shipment of large calf-skins under that head, because they obtain better prices under the former designation.

The remarkable figures for 1919-20 were due partly to the removal of the embargo which had been enforced with increasing strictness during the war upon raw hides and partly to a considerable rise in prices. The total shipments (54,000 tons) of raw hides had only been exceeded in 1912-13 and 1913-14. In the following year there was a lamentable reaction to which the heavy stocks accumulated during the boom, particularly in the United Kingdom, declining prices, adverse exchange conditions and the dullness of the Continental market were the chief contributory causes. In Calcutta, which is accustomed to work on stocks of 3 to 400,000 pieces of cow hides, unsold stocks accumulated to twice the higher of these figures, and the trade was in such a perilous condition that the question of removing the export duty was urged and seriously considered.

The slight improvement recorded in 1921-22 was only achieved at the expense of a further fall in prices, while in 1922-23 the record is one of rather better rates, but smaller shipments particularly to Germany, the United Kingdom and Spain. The distribution of the trade according to ports of shipment in 1913-14 is contrasted below with that of 1918-19 and 1922-23.

TABLE NO. 132.—Quantity and percentage share of the various ports in the export of raw hides in 1913-14, 1918-19 and 1922-23.

Ports.	1913-14.		1918-19.		1922-23.	
	Quantity.	Percentage.	Quantity.	Percentage.	Quantity.	Percentage.
	Cwts.		Cwts.		Cwts.	
Calcutta . . .	872,341	78.1	195,006	51.0	393,590	82.2
Rangoon . . .	143,159	12.8	76,478	19.8	48,520	10.1
Karachi . . .	79,669	7.2	97,618	25.6	30,940	6.5
Bombay . . .	16,738	1.5	12,611	3.3	4,640	1.0
Madras . . .	3,640	.3	234	.2	800	.2

During the war Karachi captured part of the Calcutta pre-war trade, notably in the cases of *daisie* and *dakkin* classes from the United Provinces.

Indian hides vary a good deal in size according to the breed of cattle and province of origin. Large numbers are depreciated in value owing

to the owners of the animals, from which they have been taken, having wantonly branded them. The pelts of those used for draught purposes or allowed to die of old age or starvation are also deteriorated. Indeed it may be said that improvements in the general quality of the hides marketed have scarcely kept pace with developments in the organisation of agencies for collecting them.

Hides are collected up-country from slaughter-houses or cultivators by *beparis* who consign them to *araidars* in the big markets, such as Cawnpore, Lahore and Calcutta. These *araidars* are the large dealers in the bazaar, who finance the up-country *beparis* and eventually sell the hides to the large European and Indian exporting houses and to the tanneries. Endeavours are being made by Government to teach the up country collectors of hides better flaying and cleaner curing, for the primitive methods generally employed are at present a great handicap to the trade. The share of Madras in the export of raw hides has always been inconsiderable.

The German trade covered not only the 'kills' and finer qualities of hides but also 'commons' and badly cured 'dead' hides, for which there was also a market in Austria-Hungary, Italy and Spain.

Three principal descriptions of hides are recognised, cow hides, buffalo hides, and calf-skins. Hides after being flayed, are cured either for transport by rail or for shipment to other countries by three methods :

**Descriptions.**

- (i) wet salting.
- (ii) dry salting.
- (iii) air-drying and arsenication.

Hides are scarcely ever shipped wet-salted but are preserved in this way for local transport by rail to tanneries.

Dry salted hides receive a number of applications of a solution of salt and water which is eventually left to dry on the hides, the salt used being generally *khari* (i.e., sodium sulphate). This method of cure has encouraged adulteration in certain markets, extraneous matter in the form of mud, lime, etc., being plastered on the hides to give them additional weight ; but the Calcutta Hides and Skins Shippers' Association has been giving a great deal of attention to this matter and it is hoped that improvement will soon be noticeable.

Hides are air-dried in the drier parts of India, the finest qualities being stretched on frames and known in the trade as 'framed' hides. Before exporting, air-dried hides are always arsenicated, i.e., treated with a solution of arsenic and water at the port of shipment. In the rainy season when sun-drying is impossible, a salt lotion is applied in lieu. The chief varieties of dry salted hides known to the trade are *Daccas*, *Meherpurs*, *Dinajpurs*, *Rangpurs*, and *Daisies*, and of arsenicated, *Agras*, *North-Westerns*, *Darbhanganas*, *Purneas*, *Ranchis*, *Patnas*, *Sambalpurs*, etc., the first two grades being frame-stretched hides superior in quality. *Patnas* are divided into *crumpled* and *uncrumpled*, the former being low grade hides, the appearance of which has been spoilt by careless

drying after flaying. For export, hides are again classified as *slaughtereds*, *deads*, *rejections* and *double rejections*. The hides of animals which are slaughtered, fetch better prices than those which die a natural death and they are distinguished commercially by the terms 'kills' and 'commons.' All hides, classified as 'slaughtered' and 'kills,' are not necessarily, however, from slaughtered animals but may be dead hides sufficiently fine in quality and condition to warrant the description. It should be noted that only a very small percentage of Indian raw hides are from animals actually killed and slaughtered, these being principally from the Municipal slaughter-houses in the large cities and the army slaughter-houses at the big military centres and also from Saugor, Agra and other towns in the United Provinces and Bihar where dry and barren cows are killed for the 'jerked' meat trade with Burma.

The very finest types of slaughtered hides are known as 'Commisariats,' a designation due to the fact that for many years the Indian Government purchased large quantities of cattle to supply the British troops with beef, the hides of which were branded with the letter 'C.' The Indian Government no longer buys cattle but the term still stands for the best quality of slaughtered hides.

In Calcutta raw hides are usually sold in the bazaar at prices per unit of 20 lbs. though some buyers prefer to purchase per *corge* of twenty pieces. The export houses always quote Unit of sale and shipment. per lb. c. i. f. or c. f. The unit of shipment for cow hides is the bale containing 100 to 200 pieces,\* for buffalo hides 40 to 50 pieces, and for calf-skins 500 pieces. In Bombay the unit of sale is the lb. but in Karachi as in the Punjab and the United Provinces the maund of 28 lbs., shipment being made from the former port in bales containing 1,000 to 1,200 lbs. nett and from the latter in bales of 1,150 to 1,200 lbs. gross. The unit of sale in Rangoon is the lb.

Half tanned or 'crust' tanned hides, known in the trade as East India 'kips,' the product for the most part of Indian hand-tanneries in Madras and Bombay were in pre-war days exported in considerable quantities to the United Kingdom where they were curried and turned into finished leather. The tannage used was chiefly the bark of *cassia auriculata* (known as *avaram* in the Madras Presidency and *tarvad* in Bombay), of which there are abundant supplies only in the two presidencies named and in the adjoining Indian States of Hyderabad and Mysore.

As soon as the value of these hides as upper leather for army boots was realized, every effort was made to stimulate the export, and in August 1916 the Government of India assumed control of the trade and purchased the whole supply for shipment direct to the War Office. The scale of prices was revised from time to time, but so pitched as to encourage the production of army selection leather as much as possible. Steps were also taken to prevent adulteration and improper weighting. The average outturn before the war was only 1,500,000 'kips' annually equivalent

\* In the case of hides weighing less than 4 lbs. a piece, 300.

to 27,000,000 feet of upper leather. The output at one time during the war was in the neighbourhood of three million 'kips' and at least three-fifths of the upper leather, used for the boots, of the Allies was made from Indian hides.

The statement below gives a very good idea of the expansion of business while the war and the trade boom, which followed it, lasted, though the figures are weighted with a small proportion of tanned buffalo hides and calf-skins which formed part of the Government purchase scheme. In 1922-23, after two disastrous years, there was a satisfactory recovery to pre-war levels in volume, with prices, if much lower than in 1919-20, at any rate appreciably higher than in 1913-14. But the industry is not yet wholly purged of all elements of weakness.

TABLE No. 133.—Exports of tanned hides contrasted in pre-war, war, and post-war years.

Year.	Quantity shipped	Value.
<b>Pre-war years—</b>	<b>Cwts.</b>	<b>£</b>
1912-13	233,263	1,363,278
1913-14	174,028	1,068,576
<b>War years—</b>		
1914-15	217,020	1,606,649
1915-16	273,002	2,041,582
1916-17	323,876	2,995,561
1917-18	365,145	3,269,695
1918-19	509,100	4,744,979
<b>Post-war years—</b>		
1919-20	480,440	5,252,796
1920-21	81,480	765,549
1921-22	126,280	972,124
1922-23	199,040	1,543,178

If the 1913-14 figures are represented by the index number 100, the 1918-19 figures indicate an increase of 193 per cent in quantity and 343 per cent in value. The greater part of the output was from Madras tanneries and shipped from that port. Instead of eight or nine separate tannages formerly recognised, such as *Bangalores*, *Cocanadas*, etc., Madras tannages for War Office shipments were classified into four main grades, *primes*, *best*, *good*, and *ordinary*, each of the first three being again sub-divided into two classes, according to growth and spread. In 1916-17, 99 per cent of the exports of tanned hides went to the United Kingdom and in 1919-20 93 per cent. In 1922-23 the United Kingdom's takings of tanned hides increased to 9,100 tons from 5,200 tons, being 91 per cent of the trade.

The unit of sale alike in Madras and in Bombay is the fb and shipment is made in bales of 500 lbs. nett from Bombay and in pressed, gunnied, roped bales, each containing 600 to 675 lbs., from Madras. Quotations for export are based on the lb. c.t.f.

India occupies a much stronger position in the skin than she does in the hide market.

India's exports of raw sheep and goat skins have greatly expanded during the last twenty years owing to the introduction of chrome leather tanning in the United States and the increased demand in Europe for glacé kid. Being largely

obtained from animals slaughtered for food, Indian skins, and goat skins in particular, compare more favourably than Indian hides with similar classes of pelt from other parts of the world. The condition of the trade in the last pre-war year and from 1918-19 is illustrated by the following table.

TABLE NO. 134.—Exports of raw skins from India in 1913-14 and from 1918-19 onwards.

Year.	QUANTITY IN CWTs.			TOTAL.		Average value per cwt.
	Goatskins.	Sheepskins.	Others.	Quantity, cwt.	Value £	
1913-14	459,356	83,087	140	496,583	2,260,244	4.6
1918-19	426,905	72,456	295	499,656	4,481,707	8.9
1919-20	625,000	68,740	280	699,020	10,083,087	14.6
1920-21	207,040	23,380	560	234,580	2,156,826	9.2
1921-22	435,750	6,290	60	442,100	2,770,641	6.3
1922-23	412,620	2,480	480	415,580	2,241,500	5.6

The export of goat skins, raw and tanned, from India represents about one-third of the world's supply. The United States of America has always been India's best customer for raw skins, her share of the trade often exceeding 75 per cent of the total exports. Next comes the United Kingdom, while Continental countries like France, Holland, Germany and Belgium, which differentiate against tanned skins by their tariffs, absorb considerable quantities. The fall in the quantity exported in the first two years of the war was of no great moment, and in 1916-17 there was a marked increase in the volume and an even more marked increase in the value of the skins which left India, although by a notification of the 12th August 1916 the only destinations to which shipments were permitted were the United Kingdom, the United States, France and Italy. When an apprehended shortage of tanning materials in India seemed likely to prejudice the output of East India 'kips' for the War Office, the tanning of sheep and goat skins in the Madras and Bombay Presidencies was prohibited with effect from the 28th April 1917 and this was followed up by an embargo upon the export of tanned skins to all destinations with effect from the 15th May, but the Exports of raw skins were below the level of the previous year, chiefly owing to the scarcity of freight and prohibitions subsisting in the principal markets against such imports. As in the case of hides, a boom in 1919-20 was followed by a severe set-back in 1920-21 and shipments of goat skins alone are responsible for the improved figures for 1921-22 and 1922-23, with a lower range of prices in the latter year. The bulk of the despatches of raw skins are made from the Bombay Presidency, though Calcutta individually is the port with the largest share of the trade. The pre-war distribution is contrasted in the following table with that for 1922-23.

TABLE NO. 135.—Quantity and percentage share of the various ports in the exports of raw skins from India in 1913-14 and 1922-23 contrasted.

Ports.	1913-14.		1922-23.	
	Quantity.	Percentage.	Quantity.	Percentage.
	Cwts.		Cwts.	
Bombay } Bombay Presidency	137,559	51.5	150,080	53.1
Karachi . . . . .	113,622		70,720	
Calcutta . . . . .	206,943	42.3	150,600	36.2
Madras . . . . .	27,809	5.0	43,500	10.5
Rangoon . . . . .	505	.4	500	.1

Goat and sheep skins are either dry-salted with Glauber's salt (*khari*), wet-salted with common salt, or, if purchased air-dried, arsenicated by dipping in a solution of arsenic and water. Indian goat skins are generally larger, heavier and of better texture than sheep skins. The best qualities of dry-salted goat skins sold in the Calcutta market are *daccas*, *Kushτίας*, *Dinajpurs* and *Muzaffarpurs* all of which are very suitable for the production of glacé kid. Other classes are *Darbhanges*, *Patnas*, *daisies* and *Chourichauras*, the last of which are indifferent and command poor prices. *North-Westerns*, the principal centres for which are Cawnpore and Delhi, are generally wet salted and run to a very much larger size than skins from Bengal and Bihar. The hair is coarser and the pelt thinner. *Amritsars*, which are also dry-salted, usually have a good spread. From Hyderabad and the Deccan strong medium size skins are obtainable which are mostly sent to the tanneries in Southern India where they are cured for export, but are also shipped untanned from Bombay. The export of goat skins is much larger than that of sheep skins which come mainly from the Darbhanga District of Bihar and Orissa and from Rajputana. In Madras the skins are mostly dry-salted with the hair on, but sometimes flint-dried and very occasionally are wet-salted in the hair or unhaired and then pickled in a solution of alum and salt. These are then sorted according to substance of skin and condition into *firsts* and *seconds*, the consignments usually consisting of definite proportions of each. The trade names of the best Madras skins are *Cocanadas*, *Bangalores*, *Mysores*, *Trichinopolys* and *Coimbatores*.

The unit of sale in Madras is a hundred skins and the unit of shipment is the pressed bale packed in mats and gunnies, containing 756 lbs. nett or, in the case of salted and pickled skins, the cask. The lb is a recognised unit of sale in Bombay and Karachi, but in the latter market sales are also conducted on the basis of a score of 22 numbers. In Calcutta, on the other hand, skins are sold at the rate of 100 pieces and shipped in bales of 500 pieces or casks containing 125 to 150, quotations for export being made per piece *c.i.f.* or *c.f.* High freights have discouraged shipment in casks and wet-salted skins are frequently washed on arrival at the Calcutta depôts, treated with a fresh solution of salt, sun-dried and baled. Wet-salted skins are known in the American market as *soft stock* and dry-salted as *hard stock*. In Bombay the unit of shipment varies according

to quality, dry skins being shipped in bales of 1,000 to 1,200 lbs. nett, sun-dried and salted skins in bales of 600 to 700 lbs. and wet-salted in casks of 560 lbs. In Karachi all raw skins are shipped in bales of 950 to 1,400 lbs. Each skin should be at least 21 inches wide if two sets of upper sides are to be obtained from it when it has been converted into glacé kid.\*

Tanned skins, commercially speaking, mean sheep and goat skins only, though there are some inconsiderable shipments of other pelts from

Indian ports. As in the case of tanned hides, the existence of the bark of *cassia auriculata* in the Madras and Bombay Presidencies created a large industry in lightly tanned skins, which flourished for the first two-and-a-half years of the war with very high prices in England, the United States of America and Japan. In 1917-18 the embargo upon the export of tanned skins, already referred to, reduced the volume of these exports from 166,000 to 34,000 cwts and was lifted only in September 1918, too late to effect more than a partial recovery in the figures for 1918-19. In the early part of 1922-23 Indian tanned skins were in good demand but the year closed with large stocks in hand both in London and New York.

TABLE NO. 136.—Exports of tanned skins from 1918-19 onwards with values and index numbers.

Year.	Quantity exported.	Index number.	Value.	Index number.
	Cwts.		£	
1918-19 . . . . .	59,676	100	1,701,428	100
1919-20 . . . . .	97,240	163	3,113,085	183
1920-21 . . . . .	53,200	89	1,349,367	79
1921-22 . . . . .	79,920	134	1,641,708	96
1922-23 . . . . .	93,080	156	1,828,214	107

The export of tanned goat skins usually exceeds the export of tanned sheep skins, but not to the same extent as in the case of raw skins. A feature of the last three years has been the excess of tanned sheep skins shipped, the totals for 1922-23 being 3,100 tons of sheep skins as compared with 1,500 tons of goat skins. The finest qualities of tanned sheep and goat skins come from the Trichinopoly and Coimbatore districts and the Dindigul sub-division of the Madura District of the Madras Presidency, where the tanners are very expert and produce skins, unexcelled as regards texture, colour and pliability. The finest qualities of Madras tanned skins are specially suitable for the production of light weight leathers finished in light colours. In other parts of the Madras Presidency and in Hyderabad there is a large outturn of tanned skins but they are much commoner in type. In pre-war days the chief importing country was the United Kingdom which took 78 per cent of

\* Report of the Indian Industrial Commission, Appendix D.

the skins exported in 1913-14, the corresponding percentage for 1922-23 being 69. The Japanese market for tanned sheep-skins is a post-war development. The distribution of the trade according to countries from 1919-20 onwards is shown in the table annexed, goat and sheep skins being separately distinguished.

TABLE NO. 137.--Percentage distribution of the trade in tanned goat and sheep skins among importing countries.

Countries.	Goat Skins.				Sheep Skins.			
	1919-20.	1920-21.	1921-22.	1922-23.	1919-20.	1920-21.	1921-22.	1922-23.
United Kingdom	86.8	98.0	89.8	98.8	68.2	55.8	51.5	58.4
United States of America	11.4	8.5	6.7	5.5	18.9	7.5	4.7	5.2
Japan	5	8	1.2	1	9.1	24.1	29.8	26.8

As in the case of tanned hides, the greater portion of the exports goes from Madras, the percentages from Madras and Bombay in 1913-14 being 82 and 18, and in 1922-23, 81 and 11 respectively. Tanned skins are usually sold in the Bombay market per lb. and shipment is made in bales of 500 to 550 lbs. nett. The unit of sale in Madras is the lb. and that of shipment the pressed bale wrapped in gunnies and roped, weighing 500 to 600 lbs. nett in the case of sheep skins and 610 lbs. nett of goat skins. Quotations for export are per lb. c. i. f. or c. f.

With effect from the 11th September 1919 an export duty of 15 per cent *ad valorem* was imposed on all shipments of raw hides and skins from British India based on tariff valuations.

A rebate to the extent of two-thirds of the duty, however, was allowed in the case of exports to the United Kingdom and British Possessions including mandatory territories upon production of evidence that the hides or skins had been tanned within them. From the 1st March, 1923, the duty has been fixed at an all-round rate of 5 per cent.

## OPIUM.

The opium yielding poppy (*papaver somniferum*) is an annual which grows to a height of from two to four feet. The capsules or seed pods from which the drug is obtained, are, while still green, carefully scarified with a four-bladed instrument, which causes them to exude a gummy sap and this operation is repeated three or four times at intervals of two or three days until the discharge is exhausted. The juice is scraped off and when coagulated forms crude opium, for which the flower petals, carefully collected and steamed, are used as packing.

The trade formerly recognised two descriptions of opium, based on the area of cultivation of the poppy: *Bengal* opium, obtained from certain districts of the United Provinces and Bihar (which once formed

part of the old Bengal Presidency) and *Malwa* opium the product of certain Indian States in Central India, particularly Indore, Gwalior, Bhopal, Jaora, Dhar, Rutlam, Mewar and Kotah.

In Central India the opium collected is sold by the cultivator to middlemen, from whom the large dealers again obtain their supplies.

**Malwa opium.** For export purposes the drug, which was of 90° to 95° consistency, was made up into balls of twelve ounces each and packed in half chests for despatch about the end of September. No statistics of the area under poppy were maintained, and no control was exercised by the British Government over either cultivation or manufacture; but as the States in which this opium is produced have no access to the sea, except through British territory, the regulation of exports to China, the chief market for Malwa opium, used to be effected by making the issue of passes for transport to Bombay depend upon prior payment of duty by the successful bidders at auctions, held monthly at the latter port. A few chests were also shipped annually to Zanzibar. The duty was at the rate of £40 per chest until 1912 when it was raised to £80. The last auction was held in January 1913 and the last shipment made in December of that year.

In British India cultivation is permitted only under license granted to cultivators who obtain advances from Government free of interest to meet the cost of production, on the understanding that the whole of their outturn is sold

**Bengal opium.** to the Government factory at Ghazipur (United Provinces) at a rate fixed by Government which was in 1921-22 Rs. 15 (£1) per seer for opium of 70° consistency. The opium trade was created a Government monopoly in 1773 and in 1817 the cultivation of the poppy except on account of the East India Company was forbidden. All opium was auctioned with the stipulation that it should be exported.

In British India, as in Indian States, the area under opium has since 1907 been much curtailed owing to the agreement come to with the Chinese Government for the suppression of opium traffic with that country, and the opium factory at Patna closed. In 1908 an arrangement was made with China by which the total exports of opium from India were to be reduced annually by 5,100 chests from an assumed standard of 67,000 chests and by a further agreement in 1911, the reduction was accelerated by further limitations, and exports to China have been discontinued altogether since 1913. In British India the cultivation of the poppy is now restricted to the United Provinces and the product is known as *Benares* opium. While 488,548 acres were under the crop, yielding 71,340 maunds of opium in 1907-08, in 1911-12 the area was reduced to 200,672 acres, producing 31,473 maunds and in 1913-14 to 145,000 acres. In 1921-22 the area under poppy was 135,000 acres, a decrease of 4.23 per cent on the total of the previous year. The seed is broadcasted in October and November and the capsules harvested in March and April.

**Prices.**

The following table shews the price of opium per chest (of 140½ lbs.) at Calcutta during the years 1908 to 1923.

TABLE NO. 138.—Price per chest of opium (of 140½ lbs.) in Calcutta from 1908 to 1923.

Year	Rs. As.	£. s. d.
1908	1,322 0	88 2 8
1909	1,324 0	88 5 4
1910	2,953 8	186 18 0
1911	2,925 12	195 1 0
1912	3,208 8	213 18 0
1913	1,973 1	131 10 9
1914	1,562 0	104 2 8
1915	1,602 8	106 16 8
1916	2,317 2	154 9 6
1917	3,249 6	216 12 6
1918	3,234 0	215 12 0
1919	4,025 11	268 7 7
1920	5,343 9	356 4 9
1921	4,787 15	319 3 11
1922	4,526 11	301 15 7
1923	4,762 13	317 10 5

In July 1914, when the cost of manufacture was about Rs. 500 per chest the price realised was Rs. 1,578, but upon the outbreak of war the market became much disturbed. At the August auction the average price realised was only Rs. 1,212 a chest. The decision was then taken to fix an upset price of Rs. 1,600, and though this arrested any further decline, 1,352 chests were left unsold at the close of the year. Between 1916 and 1920 there was a marked advance in price and the figures for the past three years, if not so high as in the boom year, are yet thrice as high as the average for 1913-14.

At the Calcutta sales the number of chests sold in the year 1922-23 totalled 2,890, a remarkable improvement on the 935 sold in 1921-22 and 1,550 in 1920-21, but considerably less than the 3,600 sold in 1919-20. The highest and lowest prices obtained during the year for *Benares* opium were Rs. 4,910 and Rs. 4,500, respectively.

At the Ghazipur factory, three classes of opium are manufactured: (a) *provision* opium which is intended for export, (b) *excise* opium for home consumption, the duty on which varies in different provinces, and (c) *medical* opium for export to London and for supply to the Medical Department in India for medical purposes. *Provision* opium is made up in balls or cakes weighing 3½ lbs. each, 40 cakes going to the chest. It is generally of 71° consistency. *Excise* opium which is of 90° consistency is made up in cubic packets of one seer each, 60 packets to the chest. *Medical* opium is made up in cakes, each weighing 2 lbs. at 87-50° consistency.

The unit of sale as well as of shipment of *provision* opium is the chest of 140½ lbs. The exports of opium on private account (quantities and values) in 1913-14 and from 1918-19 are shown in the table below.

**Exports.**

TABLE No 139.—Exports of opium on private account in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	16,853	2,290,051
1918-19 . . . . .	15,345	2,086,049
1919-20 . . . . .	9,166	1,306,841
1920-21 . . . . .	11,249	1,684,074
1921-22 . . . . .	8,937	1,369,485
1922-23 . . . . .	8,848	1,632,492

Monthly auctions are held throughout the year at Calcutta to meet the demands of private trade. A notification is published annually, generally before the month of October, stating the minimum number of chests which will be put up for sale in each month of the next year, and the quantities so notified are not altered without three months' notice. Sales are conducted month by month by the Bengal Government.

The principal event in the history of the opium trade in 1922-23 was the issue of a Notification by the Government of India, in pursuance of the resolution adopted by the Assembly of the League of Nations, that every application for the export of opium from India should, from the 1st January 1923, be accompanied by a certificate from the Government of the importing country that the consignment is approved by that Government and is required for legitimate purposes.

At the request of the Governments concerned the Government of India are under agreement to supply Ceylon, Hongkong, Singapore, British Borneo, Siam, and the Dutch East Indies with a regular stipulated supply of opium at a fixed price.

The quantities and values of opium shipped on Government account are, as the table below shows, steadily declining.

TABLE No. 140.—Quantities and values of exports of opium on Government account since 1917-18.

Year.	Quantity.	Value.
	Cwts.	£
1917-18 . . . . .	11,832	859,943
1918-19 . . . . .	9,609	715,015
1919-20 . . . . .	7,466	638,945
1920-21 . . . . .	6,581	626,104
1921-22 . . . . .	6,260	580,320
1922-23 . . . . .	4,647	439,092

The revenue derived by the Government of India from opium since 1913-14 is shewn in the following table.

TABLE NO. 141.—Revenue derived from opium by the Government of India since 1913-14.

Year.	Amount.
	£
1913-14 . . . . .	1,624,878
1914-15 . . . . .	1,572,218
1915-16 . . . . .	1,913,514
1916-17 . . . . .	3,160,005
1917-18 . . . . .	3,078,903
1918-19 . . . . .	3,289,111
1919-20 . . . . .	3,037,481
1920-21 . . . . .	2,356,082
1921-22 . . . . .	2,048,320
1922-23 . . . . .	2,528,138
1923-24 . . . . .	2,870,833*

\* Revised estimate.

#### RAW WOOL.

Indian wool falls for the most part in the lowest of the three classes into which the article is classified for trade purposes (*viz.*, merino, crossbreds and carpet wool) and the exports from India are generally destined for the manufacture of blankets, rugs, carpets and felt only, though some of the better quality Bikaner wool is good enough to be utilised for clothing. As compared with cotton, the internal consumption of wool in India is comparatively small, as it is unsuitable as a clothing material in the climatic conditions prevailing over the greater part of the country. Further, and perhaps for the same reason, the wool of the Indian sheep is short stapled and in every respect inferior to that of Europe and Australia. The estimated production of wool in India has been placed in the neighbourhood of 60 million lbs. per annum on the basis of 2 lbs. per sheep, as compared with 7½ lbs. the average weight of an Australian fleece. The chief centres of the trade in raw wool in India are the Punjab, particularly the Hissar district; the United Provinces, particularly Garhwal, Almora and Naini Tal; Sind, Baluchistan and the Bikaner State. The largest marts for indigenous wool are at Fazilka and Beawar, at the former of which it is subjected to a certain amount of cleaning and, if intended for shipment, pressed and baled also. In the Bombay Presidency, the black Deccan and Khandesh wools and the white wools of Sind, Gujarat and Kathiawar have a recognised commercial value and in Southern India wool-bearing species of sheep are found in the Mysore State and the Bellary, Kurnool and Coimbatore districts of the Madras Presidency. In other parts of the country the sheep yield hair without any felting qualities. A good deal of the wool which comes into the Indian market is dead wool, *i.e.*, wool that has been removed from the carcasses of slaughtered sheep and not shorn.

As regards imports, a great deal of wool enters India from Afghanistan of fairly good quality, but the indiscriminate intermixing of black and white wool of different staples tends to lower the export value of what

**Imports.** is shipped at Karachi. From Tibet, in addition to large quantities of ordinary wool, there is a considerable trade in shawl wool or *pashm*, the silky under-fleece of a particular species of goat which is superior in quality to any Indian wool. Quetta, Shikarpur, Amritsar and Multan are the chief collecting centres for wool received by land from Afghanistan and Central Asia, while the principal purchasing centres for Tibetan wool are Kalimpong on the Teesta Valley branch of the Darjeeling-Himalayan Railway and Tanakpore on the Oudh and Rohilkhand Railway. The mills in the United Provinces and Punjab also import considerable quantities of wool from Australia and intermittently from the Cape, for the manufacture of woollen goods for which the indigenous material is not suitable. Of the imports of wool by sea the bulk comes from Persia. A good deal of the raw wool grown in, or brought across, the frontier into India goes into internal consumption but the export trade, though less than a tenth of the value of that in raw cotton, is nevertheless of considerable interest and importance. In pre-war times a Bombay estimate placed the total supplies of wool in India, indigenous and imported, in a normal year at about 220,000 bales of 3 cwts., of which 180,000 bales were exported and the balance went into mill and domestic consumption.

The first recorded export of raw wool from India was in 1834 and the total quantity was rather less than 70,000 lbs. Two years later the figure was 1,200,000 lbs. and in 1872, 24 million lbs., and the advance since has been steadily

**War restrictions.** progressive. Very soon after the outbreak of war restrictions were placed on the exports of raw wool, chiefly in the interests of manufacturers in India executing Army clothing contracts, and in respect of all varieties of Tibet wool and the black and grey varieties of Madras wool, the prohibition on export was made absolute with effect from the 15th January, 1915, shipment of other descriptions being allowed under license, subject to limit of quantity. The embargo as regards Tibetan wool was in abeyance between September 1915 and January 1916 and so great was the general demand for wool created by the war, particularly as clothing for troops, that the total volume of exports of wool from India (including re-exports), in spite of restrictions, rose from 54½ million lbs. in 1914-15 to nearly 82 million lbs., in the following year, practically all for the United Kingdom. Of the re-exports in this year no less than 15 million lbs. were shipped from Karachi. Early in April 1916 the export of wool was prohibited except to the United Kingdom and the sudden closure of the United States and other markets caused an immediate slump in prices. But the decline in exports both of Indian and ransfrontier wool during the next twelve months was due rather to difficulties of freight and finance than to any embargo. 1920-21 was a dull year as it was in most lines of trade, but the figures of the last two years point to a recovery to pre-war levels. Karachi, whose usual pre-war percentage of exports was 60, now shares the trade with Bombay.

The exports and re-exports of wool in 1913-14 and from 1918-19 onwards are indicated in the table subjoined.

TABLE NO. 142.—Quantity and value of Indian and foreign wool exported from India in 1913-14 and from 1918-19 onwards.

Year.	EXPORTS.	RE-EXPORTS.	TOTAL.	
	Quantity.	Quantity.	Quantity.	Value.
	Lbs.	Lbs.	Lbs.	£
1913-14 . . . . .	48,922,061	10,245,538	59,167,599	2,000,156
1918-19 . . . . .	47,376,163	15,662,076	63,038,239	4,590,128
1919-20 . . . . .	36,319,126	15,984,490	52,303,616	3,698,923
1920-21 . . . . .	23,042,603	8,934,049	31,976,652	2,016,126
1921-22 . . . . .	32,254,497	14,876,315	47,130,812	2,335,709
1922-23 . . . . .	52,795,436	13,684,357	66,480,293	3,537,169

The chief customer for Indian wool in pre-war days was the United Kingdom, though there were some exports *via* Calcutta of Tibetan wool to the United States of America, and to a limited extent Germany and France were also recipients. 97 per cent of the shipments of Indian wool in 1922-23 were to the United Kingdom, and 86 per cent of the Tibetan.

In India the rearing of sheep and the production of wool are entirely in the hands of village shepherds who depend upon middlemen to purchase the clip from them. These middlemen,

**Trade organization.** as is usual in other Indian trades, make monetary advances to the shepherds, about six months or even earlier before the actual clipping season, up to as much as 50 per cent of the total price to be paid. The middlemen, after delivery of the wool, consign it to one of the principal Indian markets for sale outright there, though some of the bigger merchants arrange to forward the wool to Liverpool for sale on a consignment basis, through exporting agencies at Karachi and Bombay, each individual parcel being auctioned on its merits. The exporting firms who undertake this business, arrange the freight and insurance and generally pay, through a guarantee broker on the basis of a sterling bill at 3 months' sight, a percentage advance in rupees on the estimated price of the wool, which therefore virtually remains the property of the merchant till it has been warehoused, valued and sold. No sale by private treaty is permitted unless the wool fails to find a buyer at auction, and when a final settlement of accounts is made the shipper claims a net commission of 2 per cent in Bombay and 3 per cent in Karachi, of which 1 per cent in each case is paid to the broker.

These auction sales were suspended during the war, though the arrangements, other than as regards freight and insurance between the consigner and the exporting firms, were not disturbed.

The principal varieties of East Indian wool as shewn in the Liverpool price market returns are *Bikaner*, *Joria*, *Kandahar* and *Marwar*, white and yellow, and *native* black and grey. As the consignments represent assorted and clean wool, the designations under which they are marketed should be regarded as trade names rather than indicating the district of origin.

Raw wool is generally picked and cleaned upcountry, but exporting houses make advances against pressed bales as soon as they come into their possession. The unit of sale in the Karachi market is the maund of 84 lbs. and in Bombay the candy of 21 Bombay maunds. Shipment is made from both ports in bales of 3 cwts. gross. In Madras sales are made per lb. and wool is shipped in bales of four to five hundred pounds. In Bombay, while a good deal is pressed up-country, some of the wool intended for export reaches the port in *borahs*, and is sorted, pressed and graded there. It is usually made up in small lots, a consignment of more than hundred bales being exceptional.

#### WOOL MANUFACTURES.

At the end of 1922 there were ten woollen mills working in British India employing 54,051 spindles and 1,537 looms. There were also

three mills in the Mysore State with 3,260 spindles and 68 looms. Three of these mills manufactured all classes of woollen and worsted goods and the remainder manufactured blankets only. The market for their manufactures is almost entirely in India itself and during the war they were all employed to their fullest capacity in meeting Government's war requirements, and in particular in supplying greatcoat cloth, serges and putties, flannels, blankets and hosiery. There are also in India not inconsiderable quantities of hand manufactures of felts and blankets as well as of *puttoo* and *pashmina* in Kashmir and the North-West Frontier Province. Handloom weaving is generally done with hand-spun yarn, though yarn spun in Indian mills is to some extent used for the manufacture of the better classes of carpets. For the manufacture of shawls in the Amritsar district, there has been for some years past a fairly large import of machine-spun worsted yarn. The exports of manufactured woollens by land from India were valued at £45,773 in 1914-15, but, owing to the heavy demand made upon Indian manufactures, both mill and hand woven, for war purposes, the value had fallen to £22,350 in 1918-19 but in 1922-23 had risen again to £39,880. The exports of woollen piecegoods by sea have always been negligible and indeed have never exceeded 10,000 yards, and the trade in shawls, at one time considerable, has practically ceased, the number exported being 80,450 in 1908-09, 1,566 in 1918-19 and 767 only in 1922-23.

One of the results of the great exhibition of 1851 in London was to stimulate an interest in Indian pile carpets. These carpets which are for the most part handknotted in the Punjab and the United Provinces are generally

**Carpets.**

composed of a woollen pile on a cotton warp, though woollen warps with a silk pile are occasionally made to special order. The chief centre of the industry is Amritsar, where there are about two hundred looms at work. The wool used, which comes chiefly from Bikaner or from Kerman in Persia *via* Nushki, is locally spun and dyed with vegetable colours. Other centres outside the Kashmir State are Multan in the Punjab, Jaipur and Bikaner in Rajputana, Agra and Mirzapur in the United Provinces, and Ellore in the Madras Presidency. Carpet manufacture is also a feature of a number of jails, as for example Lahore, Agra, Yeraoda (near Poona) and Vellore. In Northern India the weavers are for the most part Kashmiri Mahomedans. Rugs and carpets from beyond the frontier have for many years found their way into Northern India and the two most important trade centres for these imports, which come chiefly from Persia, Russia and Turkestan, are Peshawar, the capital of the North-West Frontier Province, and Quetta. In 1886-87 the exports of carpets did not exceed £20,000 in value. At the beginning of the century there was an American boom and in 1903-04 the total exceeded £173,000, but this level was not touched again until 1910-11. The returns for 1913-14 and from 1918-19 onwards are given in the table below. The figures for 1922-23 are the most satisfactory yet recorded, though prices are on the decline.

TABLE NO. 143.—Exports of carpets and rugs from British India in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Lbs.	£
1913-14 . . . . .	1,640,770	153,446
1918-19 . . . . .	944,132	98,466
1919-20 . . . . .	2,320,129	417,439
1920-21 . . . . .	2,892,288	535,276
1921-22 . . . . .	2,881,973	463,209
1922-23 . . . . .	4,145,452	641,990

The chief recipients have always been the United Kingdom and the United States of America, and it is probable that many carpets consigned in the first instance to the former country were subsequently reshipped to New York. The Amritsar carpet manufacturers in particular specialise for the American market. Beautiful reproductions are made there and at Agra of famous old carpets in the Vienna, South Kensington and other museums.

## METALS AND ORES.

### Manganese.

The exploitation of the manganese deposits in India dates from 1892. These deposits may be classified geologically as follows:—

#### Occurrence.

- (a) deposits associated with rocks of the kodurite series, worked for export in the Vizagapatam district of the Madras Presidency;

- (b) deposits associated with rocks of Dharwar age, chiefly the gondite series, found in (1) the Balaghat, Bhandara, Chhindwara and Nagpur districts of the Central Provinces, (2) the Panch Mahals district in the Bombay Presidency, (3) the Gangpur State in Bihar and Orissa and (4) Jhabua in Central India; and
- (c) lateritoid ores found in (1) the Singhbhum district in Bihar and Orissa, (2) the Jubbulpore district in the Central Provinces, (3) the Bellary district and the Sandur State in the Madras Presidency, (4) the Chitaldrug, Kadur, Shimoga and Tumkur districts of the Mysore State, and (5) Goa (also in true laterite).

Manganese quarrying began in Vizagapatam in 1892 and in the following year over 3,000 tons were exported. In 1900-01, 90,000 tons were shipped, but since then water troubles as the workings grew deeper and lower prices have made further exploitation of the ores, which are not first grade, less profitable. The Central Provinces are now the largest producers of manganese.

The industry reached its zenith in 1907 when 902,291 tons were recovered and India deprived Russia of the first place among the world's producers of this metal. In 1908 there was a considerable decline. The total in 1913 was 815,047 long tons and the average for the quinquennium 1909-13, 712,797 tons. Formerly the fluctuations in the volume of exports were more or less directly correlated to variations of activity in the steel trade but during the war an adventitious demand sprang up in connection with the increased production of ferro-manganese, and the appreciation of prices has stimulated the quarrying of lower quality ores. There are now in India three companies manufacturing ferro-manganese but without appreciable effect upon the exportable surplus of manganese-ore. The following table shews the quantity and value of manganese ore produced in India in 1922. The value per ton has declined by over 30 per cent since 1918, but is still much above pre-war rates.

TABLE NO. 144.—Quantity and value of manganese ore produced in India in 1922.

Provinces.	Quantity.	Value f.o.b. at Indian ports.	Value per ton.
	Tons.	£	£
Central Provinces . . . . .	375,950	736,236	1.9
Bombay Presidency . . . . .	56,896	111,422	1.9
Bihar and Orissa . . . . .	16,372	32,062	1.9
Mysore . . . . .	15,868	22,876	1.4
Madras Presidency . . . . .	9,315	12,497	1.3
Total . . . . .	474,401	915,093	1.9

The number of workers employed in the manganese quarries is in the neighbourhood of 20,000 annually. The workings in British India are

subject to a royalty of 2½ per cent on the sale value at the pit's mouth, but as this is inconvenient to assess, the rate has been fixed as follows, except in the case of Madras : ¼ anna per ton of ore when the price per unit of first grade ore is 8 pence, and ½ anna for each additional penny in the unit price up to 11 pence. When the price per unit is 12d. the royalty is 3 annas per ton of ore, an addition of one anna being made for each additional penny in the unit price up to 14d., the scale thereafter up to 18d. being enhanced by a further 2 annas for every extra penny in the unit price. The royalties in Indian States are generally considerably higher.

In Mysore labour is easily obtainable, but in the Central Provinces, Central India and Sandur it has frequently to be imported. Work is generally done through contractors who are paid at a fixed rate per 1,000 cubic feet of stacked and cleaned ore and for dead work at a given rate per 1,000 cubic feet of cavity made in the quarry or of waste measured, according as the 'deads' are hard or soft.

The following were the exports of manganese ore in 1913-14 and from 1918-19 onwards, according to ports.

**Exports.**

TABLE NO 145.—*Share of the ports in the exports of manganese ore in 1913-14 and from 1918-19 onwards.*

Year.	Vizagapatam.	Bombay.	Calcutta.	Mormugao.
	Tons.	Tons.	Tons.	Tons.
1913-14 . . . . .	33,750	608,724	74,575	86,717
1918-19 . . . . .	...	180,376	204,935	(a)
1919-20 . . . . .	...	249,667	127,894	(a)
1920-21 . . . . .	12,410	391,650	376,582	25,745 (b)
1921-22 . . . . .	6,250	279,084	234,081	10,874 (b)
1922-23 . . . . .	17,026	406,832	365,385	87,917 (b)

There were considerable accumulations at Mormugao while the war lasted, for which freight could not be obtained. The exports for 1922-23 for this port mark a return to pre-war levels, and in this year some improvement was also recorded in shipments from Vizagapatam.

The distribution of Indian manganese ore in the quinquennium 1909-10 to 1913-14 discloses that out of the total of more than 3,000,000 tons, 966,000 went to the United Kingdom, 750,000 to Belgium, 661,000 to the United States of America, 485,000 to France, while Holland took 93,000, Germany 33,000 and Japan 19,000.

In 1922-23 the exports of manganese ore increased to 789,000 tons valued at over £1,100,000 from 519,000 tons in the preceding year, due mainly to greater activity on the part of iron and steel manufacturers in the United Kingdom, Belgium, and France. The United Kingdom was the largest importer with 311,000 tons as compared with 75,000 tons in 1921-22 and 331,000 tons in 1920-21. Belgium came next with 280,000 tons, as compared with 260,000 tons in 1921-22 and France increased her requirements from 94,000 tons to 144,000 tons. Ship-

(a) Information not available.

(b) Figures relate to calendar years 1920, 1921 and 1922.

ments to the United States of America, however, decreased to 13,000 tons, while there were no exports to Germany, as compared with 16,500 tons in the preceding year.

The unit of sale is the percentage of *Mn* (manganese) contained in each ton of ore and shipment is made by the ton. Ore containing 50 per cent and upwards of *Mn* is considered first grade, 48 to 50 per cent second grade and 45 to 48 per cent third grade. The price per unit in July 1914 for ore of these three grades, delivered at a port in the United Kingdom was respectively 9½ to 9¼*d.*, 9 to 9¼*d.*, and 8¾ to 9*d.* In January, 1924, the price of Indian manganese ore in the United Kingdom was quoted at 22½*d.* to 23*d.* per unit.

### Iron and Steel.

Though deposits of iron ore of good quality have been proved in many parts of India, they seldom lie sufficiently adjacent to the necessary coal supplies to justify working them on

**Iron and steel manufacture.** modern lines for the production of iron and steel. Iron smelting by primitive methods was at one time a wide spread industry all over the sub-continent, and pig iron has been turned out at Kulti since 1875, but it was not until 1914 that the manufacture of steel in India by modern processes was successfully demonstrated. The imports of iron and steel (including galvanised iron, tin plates, railway plant, etc.), in 1913-14 amounted to over 1,250,000 tons valued at £17 millions. In addition the value of machinery imported exceeded £5,000,000, including prime movers £353,000, electrical machines £345,000 and textile machinery £2,186,000. There is thus an enormous field potentially open for increased manufacture of iron and steel in India, a field in which at present there are only three companies working on European lines, the Bengal Iron and Steel Company at Kulti (Bengal), the Tata Iron and Steel Company at Jamshedpur (late Sakchi) in Bihar and Orissa, and the Indian Iron and Steel Company at Burnpore, near Asansol (Bengal). The Bengal Iron and Steel Company's works, in which ten thousand men are employed, were opened in 1875 but were not a paying concern until comparatively recently. With four blast furnaces they have a potential output of 320 tons of pig iron a day, equivalent to a normal production of nearly 10,000 tons a month. The output in 1916 was 92,244 tons. In 1922 this Company produced 110,744 tons of pig iron and 28,186 tons of cast iron castings, showing increases in both cases. The Tata Iron and Steel Company, which was floated in 1907, owns valuable iron ore concessions in the Mayurbhanj State in Orissa and the Raipur district of the Central Provinces, manganese ore deposits in the Balaghat district of the Central Provinces, magnesite and chromite in Mysore, and coal in the Jharia field. The works were completed in 1911, in September 1912 a second blast furnace was blown in, and in August, 1919, a third (the Batelle furnace), but the full effect of these additions was not felt until 1921. Before the works were started the Government of India placed a standing order with the works for 20,000 tons of steel

rails annually for ten years for State Railways, but the demands of the Munitions Board during the war largely exceeded this figure. In 1918 the works produced 198,064 tons of pig iron and 71,069 tons of rails. In 1922 the Company produced 227,683 tons of pig iron, 111,500 tons of steel, including rails and 1,810 tons of ferro-manganese, showing a decrease in each case as compared with the previous year, when the productions were 281,541 tons of pig iron, 125,336 tons of steel, including rails, and 3,076 tons of ferro-manganese. The Indian Iron and Steel Company with a share capital of £1 million manufactures pig iron, steel, ferro-manganese, etc., at Burnpore, near Asansol, 130 miles from Calcutta near an important railway junction and close to the Raniganj, Jharia and Barakar coalfields. The initial plant includes two blast furnaces capable of producing 300 tons of pig iron or 200 tons of ferro-manganese daily and by-product recovery coke ovens. The Company commenced turning out pig iron, railway sleepers and railway "chairs" in November, 1922.

The question of protection to the Indian steel industry has recently been the subject of an exhaustive enquiry by the Indian Tariff Board and their recommendations have been accepted by the Government of India, and legislation introduced to give effect to them.

**Exports.**

The exports of pig iron, ferro-manganese, and iron and steel manufactures in 1913-14 and from 1918-19 are shown in the table below.

TABLE NO. 146.—Quantities and values of exports of pig iron, ferro-manganese and of iron and steel manufactures in 1913-14 and from 1918-19 onwards.

Articles.	1913-14.		1918-19.		1919-20.		1920-21.		1921-22.		1922-23.	
	Quantity.	Value.										
	Tons.	£										
Pig iron	82,502	282,416	0,596	70,407	41,749	290,315	48,424	376,551	59,517	367,033	118,545	609,720
Ferro-manganese.*	..	..	10,878	272,045	506	16,752	3,873	47,103	..	..	16,025	6,410
Iron and steel manufactures.	628	12,725	818	17,268	649	21,845	1,341	21,708	604	20,202	2,927	22,315

\* Not recorded separately before 1916-17.

Practically the whole of the above was shipped from Calcutta. In 1922-23 the exports of ferro-manganese were entirely from Madras and went to Belgium. The chief markets for pig iron are now Japan and the United States of America, while iron and steel manufactures go mainly to Hongkong, the Straits Settlements, and Formosa.

## Gold.

India contributes only about 2 per cent of the world's production of gold and occupies the seventh position among the gold producing countries of the world. About 98 per cent of the

**Chief producing areas.** Indian output is obtained from the Kolar field in eastern Mysore, about forty miles from Bangalore, where there is a single gold-bearing reef of quartz some four miles long, and nearly the whole of the balance comes from the Anantapur field in the district of that name in the Madras Presidency. The prosperity of the Kolar gold field dates from 1885 and the high water mark of output was reached twenty years later, when 631,116 ozs. valued at £2,373,457 were recovered and £1,066,615 was paid out in dividends by the five companies working the reef. Since then there has been on the whole a decline in the output, though with intermittent recoveries, and the price of gold being considerably higher than it was before the war values are still in the neighbourhood of £2,000,000 annually.

Electrical power provided from the falls of the Cauvery River at Sivasamudram, 92 miles distant, was brought to the field in 1902 and has since been considerably increased. In addition the Kolar mines power station, originally started to supplement the hydro-electric supply with electricity generated by steam power, is a valuable stand-by in the event of any interruption to the main transmission line.

The mines are thoroughly well equipped and efficiently managed. The cyaniding process is employed to deal with the tailings. The deepest workings exceed 5,000 feet in the Ooregum mine.

The royalty paid to the Mysore Government is in the neighbourhood of £70,000 annually (apart from the charges for electric energy at the rate of £12 per kilo-watt year) while the number of persons employed in 1922 was 23,297. The whole of the output of gold was until 1914-15 exported from Bombay in the form of ingots for refining, but during the war a considerable portion of it was taken over by the Bombay mint for coinage purpose. In 1918, 2,109,660 gold *mohurs*, equivalent in weight and fineness to the sovereign, were coined at the Bombay mint, and thereafter up to April 1919, when minting was suspended, 1,295,644 sovereigns were coined. Between the years 1914-15 and 1918-19 over 2½ million ounces of mint standard gold were received by the Bombay mint from the South Indian mines.

The only other productive gold mine is the Anantapur field in the Anantapur district of the Madras Presidency. The Hatti mine in Hyderabad has not been worked since 1920, and in the Dhalbhum field in Chota Nagpur operations scarcely went beyond the prospecting stage. About ten years ago a good deal of expenditure was incurred in the exploitation of the Dharwar field, which lies partly in the district of that name and partly in the Sangli State in the Bombay Presidency, but the reef proved too poor to work profitably and the attempt was given up in 1911. The gold dredging in the bed of the Irrawaddy along a stretch of some 120 miles between Myitkyina and Bhamo, in which a good deal of capital has been sunk, has proved disappointing.

TABLE No. 147.—Value of gold produced in India from 1917 onwards classified according to provinces.

Provinces.	1917.	1918.	1919.	1920.	1921.	1922.
	£	£	£	£	£	£
Mysore . . .	2,067,541	1,986,785	1,547,558	1,728,908	2,002,025	1,816,678
Hyderabad . . .	52,013	44,986	40,680	39,246	..	..
Madras . . .	87,066	67,219	57,464	53,589	48,091	40,578
Burma . . .	4,248	739	228	61	270	139
Punjab . . .	857	541	594	285	190	176
United Provinces . . .	31	27	21	13	..	..
Bihar and Orissa . . .	16,183	9,905	785	..	..	..
<b>TOTAL</b> . . .	<b>2,221,869</b>	<b>2,060,152</b>	<b>1,627,330</b>	<b>1,822,077</b>	<b>2,050,576</b>	<b>1,857,545</b>

**Silver.**

Silver has only since 1909 been added to the list of metals won within the confines of the Indian Empire. Nearly the whole output comes from the Bawdwin mine in the Northern Shan

States in Upper Burma but is quite insignificant in comparison with the country's requirements, India being by far the largest consumer of silver in the world.

TABLE No. 148.—Production and value of silver in India from 1918 onwards.

PROVINCES.	1918.		1919.		1920.		1921.		1922.	
	Quantity.	Value.								
	Oz.	£								
Burma—										
Bawdwin . . .	1,970,614	295,592	2,164,654	324,726	2,860,727	555,324	3,555,021	568,057	4,205,564	660,292
Madras Presidency—										
Anantapur . . .	1,169	104	753	102	868	151	619	95	554	82
Mysore—										
Kolar . . .	..	..	..	..	35,802	6,097	31,947	4,856	38,106	5,861
<b>TOTAL</b> . . .	<b>1,971,783</b>	<b>295,696</b>	<b>2,165,607</b>	<b>324,830</b>	<b>2,866,397</b>	<b>562,072</b>	<b>3,587,587</b>	<b>568,008</b>	<b>4,244,304</b>	<b>676,234</b>

The output of silver at Bawdwin is, as the above table shews, steadily increasing. Silver has only recently appeared among the returns from Kolar. Production on the Anantapur gold field is declining.

Most of the silver from Burma is purchased by the Government of India for minting purposes.

### Tungsten.

Tungsten is necessary for the manufacture of high speed steel, and in the form of wire for the filaments of incandescent lamps, while tungstates are employed in dyeing and fire proofing and other industrial processes. Until about two decades ago the chief source of supply of the metal was the United States of America but to the estimated total world's production of 10,000 tons of tungsten concentrates, carrying 60 to 70 per cent of tungstic trioxide ( $WO_3$ ) in 1917, Burma contributed about a third.

The exploitation of the Tavoy and Mergui districts for this metal which occurs in the form of wolframite, to the existence of which attention had been drawn by the Geological Survey, only began in 1909. The output for the

statistical year ending on the 31st March 1910 was 100 tons and though 262 tons were obtained during the remaining months of 1910, progress was for a time hampered not only by lack of communication and difficulties of transport but also by shortsighted and wasteful methods of extraction, the labour employed being chiefly Chinese and Telegu. The production figures from 1914 for the Tavoy district are given in the following table.

TABLE No. 149.—*Output of wolfram concentrates from Tavoy from 1914 onwards.*

Year.	Quantity.
	Tons.
1914 . . . . .	1,977
1915 . . . . .	2,033
1916 . . . . .	3,034
1917 . . . . .	3,697
1918 . . . . .	3,636
1919 . . . . .	2,731
1920 . . . . .	1,679
1921 . . . . .	886
1922 . . . . .	938

Until the outbreak of the war practically the whole of the wolfram won was shipped to Germany for metallurgical treatment. During the war the wolfram deposits of Burma were of supreme importance to the Home Government, and between 1914 and the armistice no less than 17,642 tons, of a total value of £2,323,000 were exported. Of this quantity, over 14,000 tons came from the Tavoy field. Since the end of the war the industry has suffered from great discarragement and falling prices and in 1921 and 1922 India produced only 898 tons and 943 tons, respectively (including an output of 12 tons in 1921 and 5 tons in 1922 in Mergui and Southern Shan States).

The Tavoy deposits are worked by many different methods, from the cobbing hammer, pan and sluice-box on the one hand to machine drills modern concentrating mills and hydraulic plant on the other, and there is no doubt that they are still capable of supplying large quantities of wolfram when the depression into which the market has fallen owing chiefly to Chinese competition is lifted.

In Burma, wolfram has been found at intervals over a distance of more than 700 miles, from the Kyaukse in the north through the Yame-thin district, the Southern Shan States and Karenni, to the Thaton, Amherst, Tavoy and Mergui districts in the South. Many of these deposits are difficult of access and are not likely to attract prospectus with tungsten ore at its present levels. Outside Burma, there are wolfram occurrences in the Singhbhum district of Bihar, at Agargaon in the Central Provinces, and at Degana in the Marwar district of Rajputana, but these deposits are insignificant, compared with those in Burma.

TABLE No. 150.—Quantity and value of tungsten ore produced in India in 1922.

Province.	Quantity.	Value.
	Tons.	£
Burma—		
Tavoy . . . . .	938	24,736
Mergui . . . . .	4.75	285
Thaton . . . . .	25	14
TOTAL . . . . .	943	25,035

The total mine production from 1917 was : 1917,4,542 tons ; 1918, 4,431 tons ; 1919, 3,525 tons ; 1920, 2,346 tons ; 1921, 898 tons ; and 1922, 943 tons. The figures of export which are

**Exports.** compiled for the statistical year (April to March) amounted to 4,782 tons in 1917-18 and 4,870 tons in 1918-19. In 1920-21 the exports amounted to 2,251 tons, which declined to 461 tons in 1921-22, and 120 tons in 1922-23. Practically the whole of the concentrates go direct to the United Kingdom, but there have been occasional shipments *via* the Straits Settlements.

The unit of sale is the percentage of  $WO_3$  in the concentrate. Each shipment is assayed and this percentage determined and the price per ton arrived at. The price before the war was about 35 shillings per unit and during the war it was fixed by Government at 55 shillings and subsequently at 60 shillings, equivalent, with an assay of 60 per cent  $WO_3$ , to £180 a ton. In January 1924, the price of wolfram (65 per cent) in London was quoted at 12s. per unit. The unit of shipment of the concentrate is the bag, varying in weights from 56 to 112 lbs.

### Tin.

Tin mining is now a definitely established industry in Burma. The value of the output exceeded £188,000 in 1922 as compared with £50,000 ten years earlier of which one-sixth

**Production.** and five-sixths were contributed by block tin and tin ore, respectively. All the exports of tin to foreign destination from India are from Burma, where cassiterite is obtained by washing alluvial gravels, chiefly in the Tavoy and Mergui districts.

TABLE NO. 151.—*Production of tin and tin ore in Burma in 1922.*

Producing areas.	BLOCK TIN.		TIN ORE.	
	Quantity.	Value.	Quantity.	Value.
Burma—	Cwts.	£	Cwts.	£
Tavoy . . . . .	..	..	29,900	112,249
Mergui . . . . .	4,356	35,580	8,152	39,146
Amherst . . . . .	..	..	236	1,089
Thaton . . . . .	..	..	206	919
TOTAL . . . . .	4,356	35,580	37,494	153,403

In 1921, 34,032 cwts. of tin ore were produced in Burma, of which 25,000 cwts. were produced in Tavoy, 8,198 cwts. in Mergui, 618 cwts. in Amherst, 196 cwts in Southern Shan States, and 20 cwts. in Thaton. Some of the tin won in the Mergui District is smelted locally by Chinamen in small native furnaces and the block tin obtained goes into local consumption in India and Burma, but practically the whole of the ore from other localities is exported in the form of high-grade concentrates. In the case of mixed tin and wolfram concentrates chiefly from Tavoy the ore used formerly to be shipped in the first instance to the Straits Settlements for separation.

TABLE NO. 152.—*Exports of tin and tin ore from Burma in 1913-14 and last five years.*

Year.	FOREIGN.		COASTWISE.	
	Quantity.	Value.	Quantity.	Value.
	Cwts.	£	Cwts.	£
1913-14 . . . . .	4,212	24,482	1,466	13,729
1918-19 . . . . .	7,423	82,268	1,890	25,165
1919-20 . . . . .	11,560	78,539	1,138	11,745
1920-21 . . . . .	19,180	146,492	1,711	17,663
1921-22 . . . . .	32,350	204,222	2,813	24,600
1922-23 . . . . .	31,600	224,183	4,736	46,722

**Lead.**

The exports of lead from India are entirely confined to Burma and are the produce of a single mine, that of Bawdwin in the Northern Shan States, the control of which passed into the

**Occurrence.** hands of the present lessees, the Burma Corporation Ltd., in 1914. On the 31st December 1919 the ore reserves of this mine stood at 4,500,000 tons, assaying 23.9 oz. of silver, 25.7 per cent of lead, 18 per cent zinc and 1.2 per cent copper, excluding all low grade ores containing less than 20 per cent combined lead and zinc. The existence of this mine had long been vaguely known and it had been worked by Yunnanese for its silver until about 50 years ago. When the concession over this area was first taken up in 1902 enormous heaps of

lead slag were found which had been abandoned by the Chinese after extracting some of the lead and nearly all the silver.

Until the end of 1908 practically no smelting was carried on, but in 1909 a light railway from the mine to Nam Yao on the Shan States branch of the Burma Railway, close to Lashio, was completed, and nearly 12,000 tons of lead slag and 485 tons of ore, obtained from open-cut working, were transported to Mandalay, and 5,030 tons of lead and 27,000 ozs. of silver obtained from them.

At the end of 1911 the smelting plant was transferred from Mandalay to Namtu, which is about 15 miles from Bawdwin and 36 miles from Nam Yao, and a refining plant also set up. Hydro-electric power is derived from the Mansam falls over a transmission line about 20 miles long. The ores, which are very rich, consist of argentiferous galena and zinc-sulphide and a small quantity of copper pyrites, with traces of antimony and nickel.

A very large staff is employed at the mine and at Namtu, while the coolies who number between seven and eight thousand are for the most part Shans or Yunnanese.

The production of lead-ore in 1922 shewed an increase of some 28,000 tons over that of 1921, the aggregate being 144,089 tons in 1921 and 172,017 tons in 1922, while the total amount of metal extracted increased from 33,717 tons, valued at £783,131, to 39,214 tons, valued at £944,759. The quantity of silver extracted rose from 3,555,021 ozs., valued at £588,057, to 4,205,584 ozs., valued at £669,291. The value of the lead extracted increased from £23.2 per ton in 1921 to £24.1 per ton in 1922, while that of silver decreased from 39.7*d.* to 38.2*d.* per oz.

Between 1908-09 and 1913-14 the average value of lead imported into India was £140,000, chiefly in the form of sheet lead for tea chests but also lead for pipes, sheets, and tubes and pig lead. In 1922 the imports increased from 51,400 cwts. to 52,400 cwts. in quantity but the value fell from £110,000 to £103,060.

The following table shews the quantity and value of lead in 1913-14 and from 1918-19 onwards exported from India to foreign destinations.

Germany came into the market, for the first time since the war, in 1921-22 but the chief recipients are Japan, the United Kingdom, China and Ceylon.

TABLE NO. 153.—Quantity and value of foreign exports of lead in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	89,862	59,300
1918-19 . . . . .	185,951	287,121
1919-20 . . . . .	254,240	302,581
1920-21 . . . . .	491,297	648,096
1921-22 . . . . .	633,030	745,723
1922-23 . . . . .	798,879	931,153

In addition to these exports, there are also some shipments coastwise to India, amounting in 1921-22 to 33,420 cwts. and in the following year to 31,000 cwts.

### Zinc.

The principal occurrence of zinc in India is in association with the silver-lead ores of Bawdwin in the Northern Shan States. The zinc won from this mine was until the outbreak of war chiefly exported to Antwerp and Hamburg in the form of ore for conversion into spelter, and when these outlets were closed there was temporarily a large accumulation of stocks at Rangoon. A great deal of zinc was formerly lost in the lead smelting works partly by volatilisation and partly in the residual slag. Zinc ore has a particular value for India apart from its metallic content as a potential source of sulphur. In 1917-18 experimental work in connection with zinc concentrates began at Namtu and a year later the Government of India was interested in a proposal to erect zinc smelting works at Jamshedpur, where the zinc concentrates from Bawdwin would be dealt with, and the spelter and sulphuric acid yielded, made available to the Tata Iron and Steel Company for their own purposes and for subsidiary companies but unfortunately the scheme fell through. The following table shews the exports of zinc ore from Burma in 1913-14 and from 1918-19 onwards.

TABLE NO. 154.—Quantity and value of zinc ore exported from Burma in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	7,827	31,400
1918-19 . . . . .	Nil.	Nil.
1919-20 . . . . .	50	133
1920-21 . . . . .	3,025	15,067
1921-22 . . . . .	6,000	30,000
1922-23 . . . . .	10,900	54,500

The whole of the zinc shipped was obtained from Bawdwin and the exports went exclusively to Belgium.

### Copper.

Though the internal absorption of copper in India exceeds in value £2,000,000 annually, attempts to work commercially the indigenous deposits of the mineral have met with very limited success so far. A certain quantity of argenteriferous copper-ore occurs in association with the lead-zinc ore

bodies of the Bawdwin mines in the Northern Shan States of Burma, and the existence of considerable quantities of copper in Sikkim has been established, but it remains to be seen whether its extraction is commercially possible. A great deal of money has been spent in the attempt to exploit the copper deposits in the Singhbhum district of Chota Nagpur in the province of Bihar and Orissa. Latterly the low grade sulphide ores of the Rakha mine, which the Cape Copper Company have been working since 1909, have shewn such promise that a smelting plant, capable of producing 1,000 tons of refined copper annually, has been erected there and smelting for blister began in 1918. In addition three other companies are prospecting in the Singhbhum belt; and in 1922 forty tons were produced in Mysore. The following table shows the output of copper ore in Chota Nagpur since 1914. The decrease in 1918 is ascribed to temporary causes. It is stated that no copper has been or will be exported by the Cape Copper Company except small quantities of ore for testing purposes until the plant for treating the ores is in full working order.

TABLE No. 155.—*Output of copper ore in Chota Nagpur from 1914 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1914 . . . . .	4,400	6,600
1915 . . . . .	6,010	12,015
1916 . . . . .	2,173	3,259
1917 . . . . .	20,108	30,162
1918 . . . . .	3,619	4,053
1919 . . . . .	32,756	34,940
1920 . . . . .	28,167	28,167
1921 . . . . .	23,089	32,560
1922 . . . . .	30,764	20,509

Smelting operations by the Cape Copper Company, inaugurated in the year 1918, resulted in the production of 980½ tons of refined copper in the year 1919, 512 tons in 1920, 1,143 tons in 1921, and 1,037 tons in 1922.

#### Chromite.

Chromite is mined in Baluchistan, in the Mysore, Shimoga and Hassan districts of Mysore, and the Singhbhum district of Chota Nagpur in the province of Bihar and Orissa. There are also occurrences in the Andaman Islands and in the Salem district, Madras Presidency. The ore is used in the manufacture of ferro-chrome and chrome steel, while chromium salts are in large demand in connection with tanning and dyeing. The quantity and value of chromite produced in 1920, 1921 and 1922 are shewn overleaf. There was a decrease in the production in 1922, to which Baluchistan and Mysore both contributed.

TABLE NO. 156.—Quantity and value of chromite produced in India during 1920, 1921 and 1922.

Provinces.	1920.		1921.		1922.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
Baluchistan .	20,577	44,583	25,122	25,122	18,548	19,215
Bihar and Orissa	2,546	3,826	2,605	3,507	1,147	1,044
Mysore .	3,678	4,904	7,035	7,863	3,082	3,827
TOTAL .	26,801	53,313	34,762	36,492	22,777	24,086

The pre-war average did not exceed 6,000 tons annually which went to Hamburg, whence it probably found its way to Essen. At the outbreak of war a German firm in Calcutta had a large quantity collected and ready for shipment.

**Exports.** In 1916-17 six thousand tons were shipped, and in 1917-18 nearly fifteen thousand and more would have probably gone forward, if freight had been available, the deposits at Hindubagh being now linked up *via* Khenai with the Bostan-Bolan section of the North Western Railway. 82 per cent of the whole went to the United Kingdom and the balance to Italy and Japan. In 1918-19, the total shipments from India aggregated 39,381 tons, of which 12,740 tons of Mysore ore valued at £28,000 were shipped from Madras (in the absence of freight from Mormugao) chiefly to the United Kingdom for munition purposes. In 1922-23 the exports amounted to 52,500 tons as compared with 24,500 tons in 1921-22, and 37,000 tons in 1920-21. The United States of America was the largest purchaser, taking 23,700 tons. Belgium took 7,400 tons, the United Kingdom 6,200 tons, Sweden 5,500 tons, Italy 2,900 tons, the Netherlands 2,500 tons, France 1,700 tons, Germany 1,600 tons and Japan 700 tons. Of the total nearly 26,000 tons were shipped from Madras.

The price is governed in the United Kingdom by the percentage of sesquioxide of chromium contained in the ore, payment being generally made on a 50 per cent basis after analysis.

**Unit of sale.** A return of 2 shillings to 2s. 6d. per unit above or below 50 per cent is usually made to the seller or buyer, as the case may be, after the percentage has been ascertained. The demand in the United Kingdom is for ore with 48 to 52 per cent chrome content, and India's chief competitors in the London market are New Caledonia and Rhodesia.

#### Corundum.

The occurrences of corundum in India (chiefly in the form of crystals) are widely distributed, but little organised mining has yet been attempted and the returns of production are incomplete. Corundum is found in considerable

quantities in Mysore and the other chief areas of occurrence are the Khasi and Jaintia hills in Assam, the Coimbatore, Anantapur, South Canara, and Salem districts of the Madras Presidency, and Pipra in the Rewah State in Central India. The following are the statistics of production from 1914 up to 1920. Figures for later years are not available.

TABLE NO. 157.—*Production of corundum in India from 1914 onwards.*

Year.	Quantity.	Value.
	Cwts.	£
1914 . . . . .	2,359	452
1915 . . . . .	1,246	281
1916 . . . . .	37,361	2,787
1917 . . . . .	41,426	3,877
1918 . . . . .	40,281	4,108
1919 . . . . .	14,131	3,565
1920 . . . . .	4,202	363

Corundum, on account of its use as an abrasive, is a regular item of trade in most Indian cities, where the lapidary still flourishes and it is collected in a casual way by agriculturists and cowherds who dispose of it through the village *baniyas* to the large dealers.\* In view of the competition of carborundum manufactures in the United States and the commercial extraction of corundum from felspar in Canada, the Indian export trade is never likely to attain any considerable dimensions. No separate statistics of exports are maintained.

#### Monazite.

The monazite sands of Travancore owe their economic importance to the fact that they contain a percentage of thorium nitrate, used in the manufacture of incandescent gas mantles, is derived, ceria and other rare earths. In 1911 the occurrence of these sands near Cape Comorin was exploited by a concern which eventually came under German control, and the concentrates to the extent of 3,200 tons, extracted during 1911 and 1913 were said to have been shipped to Hamburg, the manufacture of thorium nitrate in India having never yet been attempted. Previous to the discovery of monazite in Travancore, Brazil enjoyed a monopoly. Occurrences in the Tinnevely district of the Madras Presidency east of Cape Comorin, near Waltair in the Vizagapatam district, as well as in the Cochin State, have since been reported.

The following table indicates the production of monazite from 1914.

\* Holland, Hayden and Férmer's Mineral Production of India, 1903-13, p. 266.

TABLE No. 158.—Quantity and value of monazite produced in India.

Year.	Quantity.	Value.
	Tons.	£
1914 . . . . .	1,186	41,411
1915 . . . . .	1,108	33,238
1916 . . . . .	1,292	37,714
1917 . . . . .	1,940	56,489
1918 . . . . .	2,117	58,819
1919 . . . . .	2,024	40,475
1920 . . . . .	1,641	32,821
1921 . . . . .	1,260	30,959
1922 . . . . .	125	1,871

Exports from Travancore in the period between 1911 and 1918, foreign and coastwise, amounted to 7,706 tons of an approximate value of £220,000. German interests have, of course, long since been eliminated. The exports,

**Exports.**

amounting to 604 tons, valued at £27,000 and 882 tons, valued at £40,000 in 1917-18 and 1918-19, from Tuticorin, were probably for the most part of Travancore monazite. The principal recipient was the United States of America, and next to her came the United Kingdom. Small quantities were also taken by Japan. In 1923 the Travancore figures of productoin were 246 tons valued at £3,709. In association with monazite are found ilmenite and zircon. Ilmenite is employed in the manufacture of magnetic electrodes, 700 tons of ilmenite and 145 ons of zircon were produced in Travancore in 1923.

The unit of shipment for monazite in Tuticorin is the bag of one cwt.

**Magnesite.**

The principal occurrence in India of magnesite, which is of value as a source of carbon dioxide and as a refractory material, is over an area of about 4½ square miles in the Chalk

**Occurrence.**

Hills near Salem, in the Madras Presidency.

The only other occurrences being systematically worked at present are in the Mysore and Haasan districts of the Mysore State. Analysis of Salem magnesite shews an average content of magnesium carbonate of between 96 and 97 per cent. The magnesite is calcined on the spot to produce caustic mangesia obtained at a temperature of about 800° C and exported in that form, the manufacture of dead burnt magnesia which involves calcining at a temperature of 1,700° C having been abandoned since 1911, owing to the cost of fuel. Apart from its value in the preparation of cement and for the manufacture of bricks for furnace linings there is no reason why Indian magnesite should not be employed for the production of magnesium sulphate or Epsom salts.

While 3,450 tons of crude magnesite were mined in 1902, the figure for the following year was 825 tons only and in 1909, 737 tons. In 1910, 5,182 tons and in 1911, 3,490 tons were recovered. There was thereafter a marked development in 1912 and 1913 (the output being 15,379

tons and 16,198 tons, respectively), and again in 1916 and 1917. In 1918 there was again a marked set back with a partial revival in the two following years. In 1921 the output increased by nearly 6,000 tons, reaching the highest figure that has yet been recorded, namely, 20,000 tons, and this total would have been exceeded in 1922 had not the output from Mysore been two thousand tons less than in the previous year.

TABLE No. 159.—Quantity and value of magnesite produced in India from 1914 onwards.

Year.	Quantity.	Value.
	Tons.	£
1914 . . . . .	1,680	557
1915 . . . . .	7,450	3,973
1916 . . . . .	17,640	14,065
1917 . . . . .	18,202	14,559
1918 . . . . .	5,853	4,641
1919 . . . . .	17,126	13,152
1920 . . . . .	14,347	11,477
1921 . . . . .	20,017	15,632
1922 . . . . .	19,273	16,048

The quantities and values of calcined magnesite exported in 1913-14 and from 1918-19 onwards are shewn below. In addition to the figures

there given, about 300 tons of lump calcined magnesite and 2,300 tons of crude magnesite were exported to the United Kingdom in 1916-17, and in 1917-18 nearly 6,500 tons of crude magnesite. There were also exports of crude magnesite amounting to 3,000 tons and 2,563 tons during 1920-21 and 1921-22, respectively.

TABLE No. 160.—Quantities and values of calcined magnesite exported from the Madras Presidency in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	3,824	8,922
1918-19 . . . . .	1,147	5,822
1919-20 . . . . .	5,825	46,600
1920-21 . . . . .	6,410	41,679
1921-22 . . . . .	6,595	54,293
1922-23 . . . . .	6,032	54,297

In 1913-14 only 6 per cent of the total went to the United Kingdom and 55 per cent to Germany and 39 per cent to Belgium. During the war nearly the whole of the export went to the United Kingdom, except in 1915-16, when 3,000 tons were shipped to France. During 1922-23, 80 per cent went to the United States of America and 12 per cent to the United Kingdom.

The unit of sale in Madras for calcined magnesite is the ton and shipment is made in bags of 185 or 190 lbs.

## LAC.

Lac is the resinous exudation of certain scale insects of the genus *tachardia*, frequenting particular trees, the nature of the host being an important factor in the resultant crop. The name is derived from the Sanskrit word *laksha*

**Cultivation.** (lakh) meaning a hundred thousand, referring to the vast numbers of minute insects at the time of swarming. The best lac is obtained from the *scheleichera trijuga* (*kusumb*) but very large quantities are derived from other species such as the *butea frondosa* (*palas*), *acacia arabica* (*babul*) *zizyphus jujuba* (*beer*) and *zizyphus zylopyrus* (*ghont*) while the *albizzia lebbek* (*siris*), *shorea robusta* (*sal*), *figus religiosa* (*pipul*) and *cajanus indicus* (*arhar*) are also suitable hosts for the insect. The cultivation of lac is probably one of the oldest minor industries in India, and if the dye was originally valued more than the resin it yielded, the latter is referred to as a wood varnish as far back as the beginning of the 16th century in the *Ain-i-Akbari*.

Lac is obtained in India from four main areas, (1) the Central India area including Chota Nagpur and the adjoining districts of Orissa,

**Area and occurrence.** Bengal and the United Provinces, the north-eastern forests of the Hyderabad state and the Central Provinces generally, and the Chattisgarh and Nagpur divisions in particular (*palas* and *kusumb*), (2) Sind (*babul*), (3) Central Assam (*pipul* and *arhar*) and (4) Upper Burma and the Shan States (*pipul* and *palas*). There is sporadic cultivation elsewhere, for example, in the Punjab (*beer*) and Mysore, and the principal factories are situated in the United Provinces (Mirzapur) and Bihar (Balarampur and Imamganj). There are also two factories in Calcutta where shellac is manufactured by special processes on a considerable scale. In certain grades the best machine-made lac cannot compete with hand-made.

No actual estimate of production is possible owing to the difficulty of obtaining reliable statistics of the stick-lac crop, and this uncertainty makes lac a highly speculative trade and leads to frequent fluctuation in the market values.

**Production.** For example, in 1903-04 the price rose to 230 shillings per cwt. and the stocks in London were as low as 12,000 chests, while the heavy arrivals of 1908-09 and the following year brought the price down to 60 shillings. At the time of the outbreak of war, the price of T. N. shellac on the London market was only 61 shillings per cwt., with 100,000 chests unsold, and in the next twelve months prices fell so rapidly that the Calcutta price (Rs. 23 per maund) was scarcely high enough to justify collection and manufacture. It was only in July 1915, when fresh uses came to be found for it as a varnish for shells, etc., and shellac was declared contraband of war, that stocks began to diminish and a revival of prices set in.

TABLE No. 161.—Prices of *T. N. shellac* in Calcutta per bazaar maund  
from 1914 onwards.

Year.	Highest.		Lowest.	
	Month.	Price.	Month.	Price.
		Rs.		Rs.
1914.	January	43½	October	23
1915.	December	37½	July	23
1916.	November	78	January	32
1917.	April	100	October	58
1918.	December	100	May	83
1919.	December	185	April	70
1920.	January	255	April	155
1921.	May	170	February	90
1922.	April	205	October	135
1923.	January	185	July	115

There are four distinct crops of shellac in India known as *bysaki*, *kushmi*, *katki* and *jethwa* respectively in order of commercial importance, though the *katki* crop is generally larger than the *kushmi*. *Kushmi* and *jethwa* apply to the produce of *schleichera trijuga* only, and the others to lac from *butea frondosa* and other hosts but none of these terms is known in Mysore, where three lac crops in thirteen months have been proved. Lac collected before the insects swarm is known as *ari*, after they have swarmed as *phunki*. The average annual production of stick-lac in India may be placed in the neighbourhood of 730,000 cwts. to which should be added 20,000 cwts. from Siam and Indo-China, the only other producing countries, to arrive at the world's figure of three quarters of a million cwts., representing about 350,000 cwts. of shellac, a maund (forty seers) of stick-lac yielding on an average about eighteen seers of shellac.

*Stick-lac* is the incrustation on the twigs of the tree which contains three main constituents, lac resin, the outermost portion of the in-

**Trade descriptions.** crustation, lac wax, secreted from specially localised regions, and lac dye contained in the free of the insect itself. Stick-lac, when ground and sifted and washed free of so much of the dye as is soluble, becomes *seed-lac* or *grainlac*, which is converted into *shellac* by fusing it over a slow fire. A small quantity of orpiment is frequently added to produce the light yellow colour required in the finer grades, and an admixture of rosin (colophony) is also occasionally made to lower the melting point. The mixture is then fused by twisting it in long narrow bags before an open fire and the molten liquid is squeezed through the bags and spread out uniformly on porcelain cylinders. When cold these sheets are assorted according to colour, the thick pieces and impurities being punched out and cast into the bags for remelting. To produce *button-lac*, the molten lac is dropped on to a smooth surface instead of being stretched. The only other commercial forms of lac which need be noticed are *garnet-lac*, which is a dark red lac made from Assam or Burma stick-lac by the spirit or wet process, usually with about 10 per cent rosin, but without

orniment, *tongue lac*, and *kiri*, the residue remaining in the bags after melting. Button and tongue lac are usually made from medium to good quality stick-lac, while shellac is made in all grades.

In India there is a considerable demand for *kiri* in connection with the manufacture of bangles, bracelets, toys and articles of domestic utility, the ornamentation of ivory and metalware, or as a cement.

Repeated attempts to cultivate lac in Japan, Formosa and German East Africa having proved fruitless and the produce of Siam and Indo-

China together being only 2½ per cent of that of India, the latter enjoys a practical monopoly of the trade. In the following tables the greatly enhanced present values of both manufactured and unmanufactured lac, as compared with pre-war rates will be noticed.

TABLE No. 162.—Exports of manufactured lac by sea from British India to foreign countries in 1913-14 and from 1918-19 onwards.

Year.	Shellac.		Button-lac.		Other kinds (except lac-dye).		TOTAL.	Average value per cwt.	
	Cwts.	£	Cwts.	£	Cwts.	£			
1913-14	275,257	1,131,876	21,865	87,139	23,646	29,095	320,868	1,248,110	3-9
1918-19	222,539	1,866,263	3,530	37,533	6,575	12,430	232,984	1,916,326	8-2
1919-20	338,980	4,573,945	13,539	176,045	19,132	57,117	371,631	4,867,107	12-9
1920-21	280,259	4,775,398	10,918	214,704	16,446	47,717	307,823	5,037,819	16-4
1921-22	379,644	5,033,124	10,724	156,263	41,660	56,258	438,228	5,245,695	12-1
1922-23	383,377	6,156,132	13,387	311,386	66,616	252,714	468,380	6,756,442	14-4

TABLE No. 163.—Exports of unmanufactured lac by sea from British India to foreign countries in 1913-14 and from 1918-19 onwards.

Year.	Stick-lac.		Seed-lac.		TOTAL.		Average value per cwt.
	Cwts.	£	Cwts.	£	Cwts.	£	
1913-14	1,196	3,449	17,097	58,975	18,293	62,424	3-4
1918-19	4	27	6,111	49,287	6,115	49,314	8-1
1919-20	1,595	6,814	2,480	28,558	4,075	35,372	8-7
1920-21	627	5,584	687	11,050	1,314	17,234	13-1
1921-22	882	7,898	1,824	23,682	2,706	31,575	11-7
1922-23	2,897	28,102	4,734	64,896	7,631	92,998	12-2

When the war had been some time in progress it became necessary, in order to secure sufficient supplies for the Ministry of Munitions (whose annual requirements for the United Kingdom and the Allies were estimated at 50,000 cwts.), to come to an agreement in January 1917 with the shellac shippers in Calcutta, whereby the shipment of lac was prohibited to all destinations, but licenses were freely given on condition that against every

export on private account a consignment of shellac, corresponding to 20 per cent of the quantity exported and of a certain specified quality, was guaranteed to Government at a fixed *f. o. b.* price of Rs. 42 per maund. Owing to the difficulty of obtaining sufficient quantities of the Government quality, the Ministry of Munitions eventually agreed to take a certain portion of their requirements in commercial T. N. London standard. In the matter of export of other qualities of lac, the Government percentage was calculated on the assumed percentage of shellac in each variety, *viz.*, 90 per cent in the case of seed-lac, 70 per cent in that of stick-lac and 40 per cent of refuse lac, giving 18 per cent, 14 per cent and 8 per cent as the proportion due to Government in respect of each. Through the co-operation of the shellac shippers this scheme worked very successfully and resulted in the supplying of 80,000 cwts. to the Ministry of Munitions. Though prices remained fairly constant in Calcutta during the period of control, the London quotation rose from 144s. in January 1917 to 450s. in April 1918, and stood at the Armistice at about 320s. Shortly after the suspension of hostilities control was discontinued, and the restrictions on export were also removed, but nevertheless shipments from India in 1918-19 were not particularly heavy owing to railway congestion between the manufacturing districts and Calcutta, and to a markedly small *bysaki* crop in 1918. The London price, which had fallen to 206s. in April 1919, began to soar again and in January 1920 touched 880s. before the inevitable reaction set in. The price in April 1924 was 285s.

The distribution of the exports in the last pre-war year and in 1922-23 is shown in the following table.

TABLE NO. 164.—*Distribution of exports of lac in the years 1913-14 and 1922-23.*

Country.	1913-14.		TOTAL.	1922-23.		TOTAL.
	Manufactured.	Unmanufactured.		Manufactured.	Unmanufactured.	
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
United States of America . . . . .	142,863	10,766	153,629	288,454	5,007	293,461
United Kingdom . . . . .	91,160	6,404	97,564	89,178	1,889	91,067
Germany . . . . .	52,298	486	52,784	33,233	198	33,431
France . . . . .	12,202	81	12,283	12,636	7	12,643
Other countries . . . . .	22,545	576	23,121	44,879	530	45,409

With a growing demand all over the world, especially from the United States of America, where extensive use is made of it in the manufacture of gramophone goods, varnishes, lithographic ink and for insulating purposes in the electrical industry, and with no satisfactory substitute yet discovered, the special war demands for shellac have, it will be noticed, been more than made good in other markets.

Exports of lac dye have for several years practically ceased though crude cake dye continues to be sold in the bazaars. Against 18,000 cwts. recorded in 1868-69 only 18 cwts. were exported in 1910-11 the last recorded. Lac dye (crimson *lake*) gives a fast bright red tint to silk and wool, and if supplies were available in a reasonably pure state should command a considerable market.

Lac wax is in demand in connection with boot polish but is not usually separated from the resin in the treatment of stick-lac, as it is believed prejudicially to affect the quality of the resultant shellac. No separate statistics are maintained of the exports of lac wax.

Imports of lac into India are on a comparatively small scale and are practically limited to stick-lac from Siam and Indo-China *via* the Straits Settlements, for conversion into shellac, averaging about 23,600 cwts. yearly.

The major portion of the lac that leaves India is in the form of a dark orange shellac known as T. N. (probably from the mark of a firm called Tularam Nataram) and is mainly derived from *palas* stick-lac. In London each year a sample, representing the average quality of the lots of common shellac, arriving from India, is standardised and quotations are made on the T. N. basis, the T. N. quotation being the medium of speculation in both markets.

In the United States T. N. (corresponding to London T. N.) 3 per cent refraction\* is allowed but the N(ew) Y(ork) T. N. and "superfine" grades must be pure and a penalty is imposed by the Shellac Importers' Association in the case of shellac containing more than 5 per cent rosin. A similar step was taken by London in 1904, when rosin admixture was restricted to 3 per cent for shellac and 10 per cent for garnet lac, but no restrictions are in force against the import of private marks containing higher percentages of adulteration. In certain industries pure shellac is not required. Rosin is added to lower the melting point, and few of the shellacs exported can be said to be entirely free from it. Orpiment (yellow sulphide of arsenic) is also added where the trade demands an opaque pale coloured shellac.

As a stiffening for silk hats, shellac, with as much as a 10 per cent admixture of rosin, is acceptable, but for other purposes so much rosin would be treated as adulteration. Calcutta shellac contracts contain a clause guaranteeing not more than a certain percentage of rosin and other impurities, the penalty being 8 annas per maund for every unit per cent up to 4 per cent above the allowed amount and Re. 1 per maund for every unit in excess.

The lac trade like so many others in India is encumbered by the large number of middlemen who intervene between the actual collector and the manufacturer or shipper. By a system of advances, the collector of sticklac and the small manufacturer are bound to *bantias* or middlemen to whom alone they can sell, and brokers again intervene at the port of shipment. Shellac is usually sold on drafts of 3 months' sight for ship-

\* *i.e.*, impurity.

ments to Europe and of 4 months' sight for the United States of America against letters of credit in London. Contracts are on a *c. i. f.* basis to Europe but in the case of America only *c. f.*, as insurance is usually arranged by the importers themselves. Occasional shipments are also made on consignment sale.

Shellac is packed for export in two maund cases (one maund = 82½ lbs.) which weigh approximately 1½ cwts., or in double gunnies. The local unit of sale is the bazaar maund, but for export the cwt. in the case of shipments to the United Kingdom, and the lb. for the American market.

The following table shews the preponderating share in the export trade enjoyed by Calcutta, even before the war.

TABLE No. 165.—Exports of lac from British India (principal ports and percentage) in 1913-14.

Ports.	Quantity.	Percentage.
	Cwts.	
Calcutta . . . . .	328,892	96.9
Rangoon . . . . .	4,068	1.3
Karachi . . . . .	3,664	1.0
Bombay . . . . .	1,296	.4
Madras . . . . .	1,240	.4

In 1918-19, Calcutta's share is represented by the percentage figure of 96.5, with total exports, aggregating 240,000 cwts., valued at £1,965,640, and in 1922-23 the percentage was 99.8.

Before the war there were occasional shipments chiefly of seed lac to the United States of America, which purchased in this market when the margin between the prices in India and Burma lac made it profitable to do so. Over 7,500 cwts. went to the United States of America in 1912-13. The overland imports from 1913-14 onwards into Burma, which constitute the bulk of what is known commercially as Burma lac, are shewn in the table below.

TABLE No. 166.—Overland imports of lac into Burma from 1913-14 onwards.

Year.	Western China.	Shan States.
	Cwts.	Cwts.
1913-14 . . . . .	2,200	9,184
1914-15 . . . . .	1,448	2,200
1915-16 . . . . .	1,934	11,982
1916-17 . . . . .	2,774	15,324
1917-18 . . . . .	4,247	12,728
1918-19 . . . . .	3,402	12,391
1919-20 . . . . .	2,975	29,945
1920-21 . . . . .	3,503	23,106
1921-22 . . . . .	5,145	39,089
1922-23 . . . . .	3,774	48,681

There is only one company in Burma engaged in shellac manufacture and the quantity of stick-lac, exported coastwise to Calcutta for conversion into shellac, amounted in 1920-21 to 23,000 cwts., in 1921-22 to 55,000 cwts. and in 1922-23 to 52,000 cwts. A royalty is levied at the Custom Houses in Burma on all exports by sea of stick-lac and manu-

factured lac from Burma at the rate of Re. 1-6 per cwt. and credited to Forest revenues.

With effect from the 1st January 1922, a cess of four annas per maund on shellac and two annas per maund on refuse lac has been imposed, the net proceeds of which are handed over to the

Lac cess.  
Indian Lac Association for expenditure on research. The collections adjusted during 1922-23 totalled Rs. 1,42,670 (£9,511).

### COFFEE.

Coffee is derived from a rubiaceous plant belonging to the same family as cinchona and madder. The bulk of the coffee grown in India is *coffea arabica*, but there has been some experimental cultivation of *coffea robusta* and of a cross between *arabica* and *liberiana*.

According to tradition Baba Budan, returning from a pilgrimage to Mecca in the 16th century, brought seven seeds and planted them on the hills, now called after him in the Kadur

**History of coffee growing in India.**

district of Mysore, but the systematic cultivation of coffee in India dates only from 1830 when Mr. Cannon opened a plantation near Chickmugalur, and during the next 30 years a large area was put under coffee not only in Mysore but also in Coorg, the Nilgiris and Shevaroy Hills, the Wynaad and Travancore. In 1862 the coffee industry in Southern India had reached its zenith, but three years later the borer beetle made its appearance in the Wynaad and Coorg, and the leaf blight (*hemileia vastatrix*), which ruined the Ceylon coffee estates, followed. Between 1877 and 1887 no less than 263 plantations in the Wynaad were abandoned and those in South Travancore practically wiped out but the industry elsewhere if it has made no head-way in the last thirty years, has at least lost little ground, despite the competition of Brazil, Guatemala and Costa Rica, chiefly because East India coffee is generally of superior quality. Indeed the coffee from certain Mysore estates commands higher prices than even the so-called Mocha, much of which, if the truth were known, is Native cherry exported by *dhow* from Mangalore and Tellicherry to Red Sea ports. When railway communication between the coffee growing area and the coast is established, the heavy cost of transport by cart with the attendant risk of theft will be greatly reduced. The acreage under coffee cultivation in India in the latest year, for which figures are available, is given below.

TABLE NO. 167.—Area under coffee in India in 1922-23.

Provinces.	Area in acres.
Mysore State . . . . .	68,138
Coorg . . . . .	31,628
Madras Presidency . . . . .	28,752
Cochin . . . . .	2,227
Travancore . . . . .	910
Burma . . . . .	75
Bombay Presidency . . . . .	48
<b>TOTAL . . . . .</b>	<b>131,778</b>

The area under coffee under the stimulus of better prices has increased by over 10 per cent since 1919-20, the Mysore acreage having risen from 55,000 to 68,000, and the Madras from 25,000 to 28,750. In 1922-23, 7,224 acres of new land were put under coffee, and 2,842 acres of old cultivation abandoned.

The yield of coffee varies considerably according to the season and the estate. On the best plantations in a good season as much as 12 cwts. to the acre has been recorded, but 400 lbs. of clean coffee per acre may be taken as a fair average yield. The total reported production of cured coffee during 1922-23 was 25,467,687 lbs., as compared with 20,586,644 lbs., in the preceding year, the yield per acre of plucked area being 296 lbs. in Madras, 251 lbs. in Coorg, 177 lbs. in Mysore, 149 lbs. in Travancore, and 126 lbs. in Cochin. The bulk of the coffee produced in India is exported, the most important markets being the United Kingdom and France. The daily average number of persons employed in the plantations during 1922-23 was returned at 67,903, of whom 41,717 were permanently employed and 26,186 temporarily employed. The crop begins to ripen in October and hand-picking continues until January. The berries which have fallen on the ground and are collected at the end of the season are known as *jackal* coffee. The ripe coffee bean or *cherry* consists usually of two seeds or berries, but in a certain percentage is found only one, which on account of its shape is distinguished by the name of *peaberry*. After plucking, the fruit is either dried and pounded or immersed in water and pulped by the wet method before it is bagged and sent down to the coast. The outer covering is known as the *pulp* and the inner adhesive layer as *parchment*, while the seed coat within the parchment is the *silver skin*.

Some coffee is sent in parchment direct to Europe, but the bulk of the coffee grown in Mysore, Coorg and the Wynaad, the Nilgiris, Palni and Shevaroy Hills is prepared for export

*Coffee curing.* at Mangalore, Tellicherry, Calicut and Coimbatore. Altogether there are eighteen large curing works employing about two hundred men and women apiece. The parchment coffee which is brought down to the coast in carts is spread out on barbecues which consist of asphalt platforms in open yards slightly sloped from the centre and divided by low barriers. After being well sun-dried the coffee is pulped or peeled by machinery and then winnowed by either machinery or hand labour, and sized. It is next 'garbled' by women who eliminate all the broken and imperfect beans. When the garbling is over the coffee is weighed and bagged in double sacks or put into casks. Commercially two kinds of coffee are recognised, (1) *cherry*, usually from Indian-owned estates, where the whole fruit is dried and not put through pulpers, and (2) *plantation* coffee, cured at the coast ports according to the process already described. Most of the cherry goes to France and of the plantation coffee to the United Kingdom. The three recognised sizes are known as A, B, and C, exclusive of peaberry, while the broken and imperfect beans are classified as *triage*. Typical pre-war prices were Rs. 50-60 for *plantation* and Rs. 40-50 for *native cherry f. o. b.*, West Coast ports; or 80 and 70 shillings respectively *c.i.f.*, London. When bagged, coffee is put up in gunnies

containing 182 lbs. nett, and formerly the greater part of the season's shipments, etc. of plantation coffee was usually effected between December and the middle of May when the West Coast ports are closed on account of the approach of S.W. monsoon. In the following table are shown the quantities and values of coffee exported in 1913-14 and from 1918-19 onwards. In 1922-23 there was a very poor crop to go forward but planters were partially consoled with considerably higher prices for their coffee.

TABLE No. 168.—Quantities and values of coffee exported from India in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.	Average value per cwt.
	Cwts.	£	£
1913-14 . . . . .	259,900	1,024,402	3.9
1918-19 . . . . .	218,504	795,856	3.6
1919-20 . . . . .	272,561	1,142,630	4.2
1920-21 . . . . .	233,430	953,120	4.1
1921-22 . . . . .	235,064	927,202	3.9
1922-23 . . . . .	169,134	824,057	4.9

In the next table the quantities of coffee shipped from each of the principal ports and the proportionate share of each in the last pre-war year and in 1922-23 are contrasted. It will be seen that the trade is practically confined to three ports on the West Coast, Mangalore to which the bulk of the Mysore shipments are consigned, accounting for more than half the exports.

TABLE No. 169.—Distribution of the trade in coffee among principal ports in 1913-14 and 1922-23 contrasted.

Ports.	1913-14.		1922-23.	
	Quantity.	Percentage.	Quantity.	Percentage.
	Cwts.		Cwts.	
Madras Presidency—				
Mangalore . . . . .	120,814	} 98.7	100,023	} 95.01
Tellicherry . . . . .	90,296		39,631	
Calicut . . . . .	33,416		19,939	
Tuticorin . . . . .	10,898		22	
Other ports . . . . .	1,951		2,430	
Bombay Presidency—				
Bombay . . . . .	2,439	9	7,017	4

In 1917 it was found necessary to restrict the exports of coffee, and the suggestion of large purchases by the military authorities for the troops in the eastern theatre of war, as an alternative to tea, provoked so much opposition that it was not persevered in. An unusual feature of the 1918 shipping season was the purchase of 2,000 tons by the Greek Government, for which freight was found in a Greek vessel, and this contract was followed in 1919 by a second for 3,500 tons.

## TIMBER.

The Indian forests are a source of considerable profit to the State, yielding a net revenue in 1921-22 of about £1,200,000. The area covered by reserves under the control of the Forest Department in India is about a quarter million square miles, of which more than 100,000 square miles were brought under regular management and systematically conserved and worked in 1921-22 by the Imperial Forest Service.

The annual outturn of timber and fuel from Government forests may be roughly estimated as seven million tons, of which over 500,000 tons are teak (*tectona grandis*) from Burma forests. Other important timbers extracted include deodar (*cedrus deodara*), sal (*shorea robusta*), shisham (*dalbergia sissoo*), rosewood (*dalbergia latifolia*), eng (*dipterocarpus tuberculatus*), matti *terminalia tomentosa*, padauk (*pterocarpus macrocarpus*), pyinkado (*xylia dolabriformis*), and Indian mahogany (*cedrela toona*). Artificial plantations cover nearly 150,000 acres, perhaps the most important, apart from rubber, being the teak plantation at Nilambur in the Malabar district of the Madras Presidency (started in 1842), and the numerous coupes for fuel purposes of casuarina, eucalyptus and deodar.

The foreign exports of timber are almost entirely of teak from Burma but in 1923 there was a marked improvement in the demand for other varieties in the London market, particularly

**Exports.** for *pyinkado* from Burma, rosewood from Madras and *padauk* from the Andamans. In 1913-14 the exports from Rangoon amounted to 42,406 cubic tons valued at £426,200 and from Moulmein 6,122 cubic tons valued at £65,300. The United Kingdom took 27,416, and Germany 6,282 tons. Owing to the increasing scarcity of supplies, prices had been rising for several years past and stocks growing depleted. The coastwise exports were from Rangoon 78,763 cubic tons, valued at £493,400, and from Moulmein 34,328 tons, valued at £251,400.

The foreign trade was dislocated by the war, and in 1916-17 exports from Burma had declined to 23,944 cubic tons, valued at £304,300 from Rangoon and 74 cubic tons, valued at £733 from Moulmein, but owing to increased demands for military and building purposes from India proper, the coastwise exports totalled 145,518 cubic tons, valued at £1,109,600. A certain amount of teak from Siam forests close to the Burma frontier is floated down the Salween River to the timber yards at Moulmein and is re-exported from there. The total quantity so brought down rose from 7,153 cubic tons in 1917-18 to 17,549 tons in 1918-19. The foreign exports of timber other than teak from Burma have hitherto been comparatively small but considerable quantities of *eng* and *pyinkado* are shipped in normal times to Bombay and Calcutta.

The exports from Burma on Government account during the last two years of the war amounted to nearly 150,000 tons. A good deal of the teak went to Mesopotamia, and other theatres of war supplied with scantlings, etc., were Salonica and East Africa.

The quantity and value of timber exported in 1913-14 and the last 5 years are shewn in the table subjoined.

TABLE No. 170.—Quantity and value of exports of timber in 1913-14 and from 1918-19 onwards.

Year.	Quantity.		Value.
	Cubic tons.		£
1913-14 . . . . .	58,672		571,636
1918-19 . . . . .	33,312		423,390
1919-20 . . . . .	50,512		875,067
1920-21 . . . . .	45,446		788,438
1921-22 . . . . .	19,194		333,513
1922-23 . . . . .	32,426		557,442

Apart from Siam and Java teak imported in considerable quantities into Calcutta there have always been large quantities of comparatively cheap foreign timber coming into India for various purposes, such as furniture making, packing cases, etc. Wooden railway sleepers imported on Government and private account, which are registered under a separate statistical head, have been included in the next table for the sake of completeness. Of the cheaper timbers the principal are Oregon pine imported from America and jarrah wood from Australia.

TABLE No. 171.—Imports of timber including railway sleepers into India in 1913-14 and from 1918-19 onwards.

Year.	QUANTITY.		TOTAL VALUE.
	Timber.	Railway sleepers.	
	Cubic tons.	Cwt.	£
1913-14 . . . . .	96,148	1,090,063	765,011
1918-19 . . . . .	36,780	N/A	431,817
1919-20 . . . . .	68,036	15,420	824,829
1920-21 . . . . .	62,382	458,160	1,000,211
1921-22 . . . . .	54,444	280,560	711,331
1922-23 . . . . .	36,146	326,740	473,405

There are 135 saw-mills in Burma, of which 24 are of considerable size, employing more than hundred persons daily, 13 in Assam, 12 in the Bombay Presidency, 3 in the Central Provinces, 5 each in Bengal, the Madras States, and the Madras Presidency, the biggest being at Kallai near Calicut employing 418 operatives, and 1 each in the Punjab, the United Provinces, and Mysore.

The unit of sale in the case of timber is usually the cubic foot, the method of measurement employed being known as the Hopps (i.e., length  $\times$  square of  $\frac{1}{4}$  girth) which governs all transactions in round timber in Burma. Fifty cubic feet of timber go to the cubic ton.

## SANDALWOOD.

East Indian sandalwood is the heartwood of *santalum album*, an ever green tree whose occurrence is practically limited to a restricted area in Southern India, chiefly in Mysore and

**Occurrence.** Coorg and the Coimbatore and Salem districts in the Madras Presidency, and to a more limited extent in Travancore and Sandur States.

Sandalwood is mentioned in ancient Sanskrit literature and, long before the exploitation of the East by European traders, was a principal article of commerce. The heartwood (equivalent to about one-third of the felled tree by weight) is employed in the manufacture of small caskets and picture frames and for carved work in general. Considerable quantities are also utilized for religious rites and ceremonies. Hindus all over India smear sandal paste on their foreheads and upper parts of the body and the wealthier burn billets of it when cremating their dead. The wood is also used in the fire temples of the Parsees. The oil content of the heartwood varies from 5 to 7 per cent. This essential oil has valuable medicinal properties and considerable use is also made of it in perfumery and in the manufacture of superior toilet soaps. The local demand of sandalwood for these various purposes has been estimated at between 500 and 600 tons annually out of a total of 2,750 tons coming commercially into sight in pre-war times. During the war this total fell to about 2,050 tons but the sea-borne trade returns shew only the export values and not the weights, and the former cannot safely be compared with the figures furnished by the auction sales as they probably include the cost of carriage to the port, handling charges and the exporter's profit.

In Mysore and in Coorg all the trees are State property, and in Madras, though private ownership is recognised, production is almost a monopoly of the Government Forest reserves.

**Production and sales.** All wood collected during the year in the three provinces was formerly sold by public auction, the average quantity thus disposed of ranging between 2,500 and 3,000 tons annually. At the sales held at the end of 1912 (for statistical purposes 1912-13), indication of a powerful competitor having entered the market was revealed by the disposal of 2,418 tons for £151,200 and these greatly enhanced values were more than maintained in the following year. It is now known that the enhancement in the rates offered for sandalwood in 1912 was entirely due to competition on behalf of German buyers, who were either desirous of accumulating stocks against the day believed to be not far distant when the market would be closed to them by war, or had set themselves out to obtain a virtual monopoly of the supply of East Indian sandalwood for distillation purposes. With this competition eliminated, the auctions at the end of 1914 proved a complete fiasco, though some small sales were effected early in 1915 at prices almost up to pre-war levels and at the next auction 2,000 tons were disposed of for £113,300 owing to American purchases, partly it is believed, on German account. Before the auction took place in the following year, the Bangalore factory had opened and the Mysore

Government materially enhanced the upset price. Though only 1,347 tons were sold, no less than £153,300 were realized. Since then Mysore auctions have been suspended. The quantity sold in Madras is not separately recorded. In Coorg 380 tons were disposed of in 1915-16 for £23,330, and in 1917-18, when Mysore competition was for the first time eliminated, 300 tons realized rather more than £35,000. The average price per ton realized at auction nowhere much exceeded £33 before 1912, when buyers acting on behalf of Messrs. Schimmel raised it to over £60. In 1913-14 the average was £70 in Mysore and £66 in Coorg, and in 1916-17 £114 and £105.

The extraction of oil by crude methods is one of the oldest indigenous industries in India, the principal centre being Kanauj in the United Provinces where by primitive and wasteful processes costly attars and perfumeries are still produced. Though there are a number of small distilleries in the adjoining Madras districts, distillation was long prohibited in the Mysore State; but the collapse of the demand for the wood after the outbreak of the war led Sir Alfred Chatterton, Director of Industries in Mysore, to carry out experiments for the distillation of the oil, and in May 1916 the first factory was opened at Bangalore under State management with a producing capacity of 2,000 lbs. a month, at a most favourable time when the price of sandalwood oil in London was increasing at every sale. In the table below are shewn the prices of East Indian sandalwood oil.

TABLE NO. 172.—*Prices per lb. of East Indian sandalwood oil in 1914, 1917 and last two years.*

Year.	Shillings.
1914—	
July . . . . .	21
December . . . . .	23
1917—	
Highest . . . . .	53
Lowest . . . . .	47½
1922—	
Highest . . . . .	30
Lowest . . . . .	25
1923 . . . . .	25

Distillation on a large scale in India involves a not inconsiderable reduction in freight requirements as every ton of wood yields, on an average, 100 lbs. of oil, the weight of which packed is only a tenth of the wood itself. The monthly capacity of the factory at Bangalore has since been enlarged to 6,000 lbs. whilst a second factory with an ultimate capacity of 20,000 lbs. a month started work in August 1917 in Mysore. On account of trade depression in the latter part of 1920-21 and the consequent accumulation of stocks, manufacturing operations were carried on only in the factory at Bangalore during 1921-22. The market for the oil was dull in the first half of the year but showed signs of revival in the second half. Six hundred tons of sandalwood were treated during 1921-22 as against 1,620 tons in 1920-21, the total amount

realised by the sale of the oil being £154,200. The factory at Mysore re-started working in October 1922 after a shut-down of 18 months. The year 1922-23 opened with a stock of 136,136 lbs. of oil and 81,930 lbs. were manufactured during the year, the closing stock at the end of the year being 68,437 lbs. The amount realised by the sale of oil in the twelve months was £179,663, and the profit earned by the factories during the period was £11,170.

The values of the exports of sandalwood and sandalwood oil in 1913-14 and from 1918-19 onwards are shewn in the next table. The principal ports from which shipments of the wood are made are Mangalore, Tellicherry, Calicut and Cochin, while the oil is generally shipped from Madras, Mangalore, Calcutta and Bombay.

TABLE NO. 173.—*Values of sandalwood and sandalwood oil exported in 1913-14 and from 1918-19 onwards.*

Year.	VALUES.	
	Sandalwood.	Sandalwood oil.
	£	£
1913-14 . . . . .	128,626	
1918-19 . . . . .	10,529	227,563
1919-20 . . . . .	62,137	274,845
1920-21 . . . . .	29,334	201,985
1921-22 . . . . .	47,531	98,337
1922-23 . . . . .	56,227	157,702

The principal destinations for the wood in pre-war days and in 1922-23 are contrasted in the table below. During the war the United Kingdom and the United States of America appropriated between themselves more than 75 per cent of the quantities shipped, and Japan also increased her demands. Germany is now once more the principal customer for the wood, and Holland is taking a much larger percentage than ten years ago.

TABLE NO. 174.—*Distribution of the trade in sandalwood among importing countries in 1913-14 and 1922-23.*

Destinations.	Percentage.	
	1913-14.	1922-23.
Germany . . . . .	43.4	83.6
United Kingdom . . . . .	21.7	6.0
United States of America . . . . .	15.5	20.6
France . . . . .	7.7	1.0
Holland . . . . .	3.1	15.8
Ceylon . . . . .	.4	
Egypt . . . . .	3.8	1.6
Japan . . . . .	.8	8.2

As regards sandalwood oil, the earliest Mysore shipments went almost exclusively to the United Kingdom, with Japan which received 4,231 gallons in 1918-19 as the chief competitor. The distribution of the trade in oil in 1922-23 is shewn in the next table.

TABLE No. 175.—Exports of sandalwood oil in 1922-23 shewing the share of the principal recipients.

Destinations.	Quantity.	Value.
	Gallons.	£
United Kingdom . . . . .	9,867	121,982
Japan . . . . .	1,799	23,506
France . . . . .	291	3,184
Hongkong . . . . .	332	3,533
Egypt . . . . .	65	847
Australia . . . . .	38	320
Straits Settlements and Federated Malay States . . . . .	42	502
Other countries . . . . .	315	3,868
TOTAL	12,749	157,702

Every consignment of sandalwood oil from the Mysore Government factories is covered by a certificate of quality from Messrs. Sudborough and Watson of the Indian Institute of Science, Bangalore, ensuring the shipment of only the highest grade of oil.

There are some imports, chiefly into Bombay, of Australian sandalwood (*fusanus spicatus*) and sandalwood from the Dutch East Indies via Singapore for religious and ceremonial purposes.

The unit of sale varies at the different West Coast ports. In Mangalore the wood is sold per candy of 5 cwts. and shipped in bags weighing 6 qrs., whereas in Calicut and Tellicherry sales

are made per cwt. and shipment takes place in bundles of  $1\frac{1}{2}$  to  $2\frac{1}{2}$  cwts. The unit of sale of the oil in Mangalore is the seer of 24 tolas, shipment being made in copper pots of 3 qrs. each. In Madras and in Calcutta it is sold by the lb. and shipped in tins packed in cases varying in weight from 48 to 60 lbs. at the latter port and 100 lbs. at the former.

## DYEING AND TANNING SUBSTANCES.

### Myrobalans.

Myrobalans, the commercial name indiscriminately applied to the fruit of *terminalia chebula*, *terminalia belerica* and *phyllanthus emblica*,

which are widely distributed over India, are a valuable tanning agent. Considerable difference exists in the percentage of tannin contained in the dried fruit. The best qualities are oval and pointed and solid in structure while the less valuable are round and spongy. On the English market there are five chief kinds recognised, called after the localities where they are marketed: *Bimlies* shipped from Bimlipatam in Madras, *Rajapores* and *Vengurias* from Bombay, *Jubbulpores* from the Central Provinces, and *Madras*. On the London market *Madras No. 1 whole nuts* used to command the highest price, while tanners held different opinions as to the relative value of *Bimlies* and *Jubbulpores* which are abbreviated and referred to as B1 or J2, the figure representing the quality.

The fruits are generally picked over for shipment and contracts made on the basis of fair average of season, the unit of sale in Madras being the candy of 500 lbs. and of packing the bag of 164 lbs nett. In Calcutta the nuts are shipped in  $\frac{1}{2}$  cwt. packets and sales are made per bazaar maund, while in Bombay the unit of sale is the candy of 25 Bombay maunds and shipment is made in bags of 140, 168 and 182 lbs.

High freights first encouraged shipments of crushed myrobalans, i.e., with the kernels removed, and myrobalan extract. The concentrated extract containing 50 to 60 per cent tan is usually shipped in solid blocks.

In 1922-23 the exports of the extract, chiefly to the United Kingdom, amounted to 3,000 tons, valued at £53,000, as compared with 2,000 tons, valued at nearly £33,000, in 1921-22 and 1,900 tons valued at £38,000 in 1918-19. The extract is packed for shipment in bags or cases weighing about one cwt. each.

In the following table will be found the quantity and value of myrobalans exported during 1913-14 and the last five years. In 1922-23 crushed myrobalans accounted for more than half the shipments.

Exports.  
TABLE NO. 176.—Quantity and value of myrobalans exported in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	61,819	379,626
1918-19 . . . . .	41,195	328,936
1919-20 . . . . .	92,901	675,413
1920-21 . . . . .	39,647	271,873
1921-22 . . . . .	61,947	391,106
1922-23 . . . . .	72,038	493,367

In Calcutta the season for shipment runs from December to June. The chief markets before the war were the United Kingdom, Germany, the United States of America, Belgium, France and Austria-Hungary, though the exports to the United Kingdom were diminishing and those to the Central Powers and Belgium increasing. In 1922-23 the principal recipients were the United Kingdom, the United States, and Germany in that order. Of the total exported in 1913-14, 32,652 tons went from Bombay, 23,500 from Bengal and 5,667 from Madras. There is a large coast-wise trade in Western India, chiefly from smaller ports, such as Vengurla in the Ratnagiri district, into Bombay itself.

#### INDIGO.

Indigo is the produce of several species of plants belonging to the genus *indigofera*, especially *indigofera arrecta*, *tinctoria* and *sumatrana*, which yield the well known dark blue dye of commerce. Until 1907-08 indigo represented more than half the total value of dyeing and tanning materials exported, but no more than one-fifth in 1913-14. The historical record of indigo goes back almost to the beginning of the Christian era and the process of

manufacture is described by many early travellers to India. Originally the industry in Western India was in Portuguese hands, but about 1778 the East India Company revived it in Bengal and gave it direct encouragement for the next twenty years, and when about 1837 the industry migrated to Tirhoot and the United Provinces, India recovered the foremost place among indigo producing countries of the world from which she had been temporarily ousted by the West Indies. India's position remained unassailed though there was cultivation also on a considerable scale in Java, until German laboratories, thanks to an accident, found themselves in 1897 at last in a position to produce indigo (which had actually been synthesized nearly thirty years earlier) on a commercial scale. The fate which had already overtaken the madder and lac dye industries thereupon threatened the factories of Bihar. A decline in the exports of natural indigo from India (and also in Java) began almost immediately, and though at one time it was hoped that the introduction of the Natal-Java plant (*indigofera arrecta*) giving a higher yield of indigotin with improved methods of cultivation and extraction might stem the tide, this retrogression proceeded steadily until the declaration of hostilities in 1914. By 1910 the Java industry was dead, and in 1913-14 the area under cultivation in India was scarcely more than a tenth of that in 1895-96.

Soon after the outbreak of war the shortage of dye stuffs among the Allies (except perhaps in Japan) became acute, and in India when the

Calcutta indigo sales were resumed in December 1914 the prices realized were nearly four times as great as those of the previous March. In January 1915 the quotation was £70-10s. and the rate continued in the neighbourhood of £61 until March 1917. The record for the following year and for 1920-21 is given below.

TABLE NO. 177.—*Prices of indigo in Calcutta in 1913-14, 1917-18 and from 1920-21 onwards.*

Months.	Price per cwt.				
	1913-14	1917-18.	1920-21.	1921-22.	1922-23.
	£. s.	£ s.	£. s.	£ s.	£ s.
December . . . . .	17 10	30 0	42 5	42 5	30 7½
January . . . . .	17 10	32 10	42 5	33 15	27 0
February . . . . .	17 10	32 10	42 5	33 15	27 0
March . . . . .	17 10	32 10	42 5	33 15	27 0

With this encouragement to exporters and with the Indian dyers finding supplies of aniline increasingly difficult to obtain, and then only

at extravagant rates, the area under cultivation increased by over 100 per cent in 1915-16 and again by another 100 per cent in the following year. But even then the total was less than half the high water mark reached twenty years before, and the output was scarcely proportionately raised as the increase in cultivation was chiefly in Madras and the United Provinces where, owing to the dye being manufactured in more

primitive fashion, the outturn is generally lower than in Bihar. A reaction had set in even before the armistice. The dye shortage in the United Kingdom led to the reopening of the Badische branch works at Ellesmere Port for the manufacture of aniline and alizarine dyes, as soon as the secrets of manufacture had been re-discovered by English chemists, and now Germany is once more in a position to export her dye stuffs freely. In 1917-18 there was a fall in the acreage under the plant, and a marked fall in prices, and in 1918-19 these elements of weakness became even more accentuated. The following table shews the total area under indigo, the estimated production and exports in 1896-97, and from 1912-13 onwards. While the area in 1922-23 was 60 per cent above and the yield nearly double the corresponding figures for 1913-14, the loss of the Japanese market in competition with synthetic indigo resulted in the lowest total of exports ever recorded. Japan took only 400 cwts., as compared with 7,200 cwts. in the previous year. Egypt, Mesopotamia and the United Kingdom in that order were the principal recipients.

TABLE No. 178.—*Area, yield and exports of indigo in 1896-97 and from 1912-13 onwards.*

Year.	Area.		Yield.		Export.
	Acres.	Cwts.	Acres.	Cwts.	Cwts.
1896-97 . . . . .	1,688,901	168,673			169,523
1912-13 . . . . .	220,100	39,100			11,857
1913-14 . . . . .	172,600	26,800			10,939
1914-15 . . . . .	148,400	25,200			17,142
1915-16 . . . . .	353,100	55,100			41,938
1916-17 . . . . .	770,000*	95,700			34,230
1917-18 . . . . .	710,600	127,000			31,062
1918-19 . . . . .	292,000	48,600			32,707
1919-20 . . . . .	248,300	43,300			32,687
1920-21 . . . . .	245,800	43,700			10,259
1921-22 . . . . .	334,800	67,300			12,362
1922-23 . . . . .	285,300*	52,400*			4,535

\* Figures are subject to revision.

The area and production in the various provinces at the outbreak of war, as compared with those in 1922-23, are given in the next table.

TABLE No. 179.—*Area and yield of indigo in each province according to the forecast in 1914-15 and 1922-23.*

Provinces.	1914-15.		1922-23.	
	Area.	Production.	Area.	Production.
	Acres.	Cwts.	Acres.	Cwts.
Madras . . . . .	71,700	13,600	141,300	32,600
Bihar and Orissa . . . . .	38,500	5,500	35,400	4,100
Punjab . . . . .	20,400	3,400	50,300	9,300
United Provinces . . . . .	12,300	1,500	39,100	4,000
Bombay and Sind (including Indian States). . . . .	4,200	1,000	11,900	2,200
Bengal . . . . .	1,300	200	7,300	200
<b>TOTAL</b> . . . . .	<b>148,400</b>	<b>25,200</b>	<b>285,300</b>	<b>52,400</b>

It will be seen that by far the largest area under the crop is in Madras where (as in the Punjab and the United Provinces) it is for the most part cultivated in small holdings and the inferior dye produced largely disappears in local consumption, though there has always been a definite market for the better grades, particularly in the Levant. There is also an appreciable but not definitely ascertainable area under indigo in Travancore.

The Bihar crop usually comes on the market in December and the export season is completed before the end of the statistical year, while the Madras season for the best grades runs from July to February. The trade names for the two principal varieties of indigo sold on the Calcutta market are *Bihar cake* (also known as *Bengal and Tirhoot*) and *Oudh and Benares*, while the Madras indigo for which occasional quotations are made is known as *kurpah*.

The province which contributed chiefly to the foreign export trade before the war was Bihar where the dye is more systematically extracted and marketed under European supervision.

**Exports.** The bulk of the indigo produced in the factories of Bihar is in normal years exported and the Calcutta trade returns are a very fair gauge of the total production of that province. When in 1894-95, 237,449 cwts. were produced from 1,688,042 acres, 106,830 cwts. were exported from Calcutta and in the last pre-war year the all-India exports amounted to 10,939 cwts. when 8,752 cwts. came from the factories of Bihar.

The following table shews the distribution of the export trade among the principal ports concerned. Calcutta and Madras were almost equally affected in 1922-23 by the disappointing demand from Japan.

TABLE NO. 180.—*Share of the principal ports in the exports of indigo from 1915-16 onwards.*

Ports.	1915-16.	1916-17.	1917-18.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
	Cwts.							
Calcutta . . . . .	19,137	13,614	18,519	18,040	15,739	3,901	6,340	2,180
Madras . . . . .	26,171	12,280	3,411	10,246	12,132	4,784	5,039	1,720
Bombay . . . . .	2,565	8,102	8,922	4,281	4,179	1,301	837	556
TOTAL (including other ports)	41,932	34,230	31,052	32,707	32,057	10,250	12,362	4,536

The feature of the export trade in 1915-16 was the heavy shipments from Madras, greatly in excess of those from Bihar, which went chiefly to the United Kingdom but also to Egypt, Persia and the United States of America. The large decrease in the exports in 1922-23 has already been noticed.

China and Japan have always been by far the largest markets for synthetic indigo, their combined consumption in 1913 (on a basis of 20 per cent paste) being 27,000 tons out of an estimated exportable surplus from Germany of 47,000 tons. In the same year the United Kingdom, British Possessions and the United States together took little more than 4,000 tons.

In 1918 by an Act of the Imperial Legislature, an indigo cess was imposed at the rate of one rupee per bazaar maund (of 82 $\frac{3}{4}$  lbs. avoirdupois) on all Indian indigo exported, the proceeds of the duty to be expended by the Government of India for scientific research work in connection with the cultivation and manufacture of indigo, a corresponding cess being imposed on all exports from Travancore to ports outside British India or to Aden. Investigations were conducted at the Pusa Research Institute by the Indigo Research Chemist to the Government of India but these were terminated and the cess abolished with effect from the 1st August, 1923. In 1922-23 the cess yielded £533 only.

Prices are quoted in Calcutta at so many rupees *f. o. b.* or pounds *c. i. f.* sterling per lb for London, the unit in the local bazaar being the factory maund of 74 $\frac{1}{2}$  lbs. The paste is shipped in cases containing 4 or 4 $\frac{1}{2}$  maunds each.

The unit of sale in Madras is the maund of 25 lbs., but the unit of shipment varies according to destination. Egypt requires cases weighing from 80 to 90 lbs. nett, Japan 150 lbs. gross, while indigo to Europe goes in cases weighing 250 to 300 lbs. nett.

### Turmeric.

Turmeric is derived from *curcuma longa* which is extensively cultivated in India for the sake of its rhizomes, which are edible, and also yield a valuable dye. The total area under the crop was estimated some years ago to be at least 100,000 acres,\* but this is probably very much under the mark. In 1902-03 the exports from India amounted to 126,000 cwts. valued at £66,666. Next to Formosan turmeric, the Indian product commands the best prices. In pre-war days quotations on the European market fluctuated between 12 shillings and 26 shillings per cwt. The turmeric known in the European trade as *Cochin* is grown at or near Alwaye in the Travancore State. Other varieties with special quotations are known as *daisee*, *Masulipatam*, *Madras* and *Gopalpur*, while on the Calcutta market there are two descriptions, *Pabna* and *country*, of which the former commands better prices. The root is marketed as *fingers* or *bulbs*, the former being superior in quality to the latter. Five per cent bulbs may be included in a shipment of fingers. The normal outturn per acre varies from two to four thousand lbs. of dried and cured rhizomes, and the Madras Presidency alone is estimated to produce a hundred thousand tons.

The bulk of the trade went to Germany, France, Ceylon, the United Kingdom and Russia, the ports participating in the foreign traffic being Bombay, Madras, Tuticorin, Cochin, Calcutta and Rangoon. In the following table are shewn the quantities exported in 1913-14 and the ports from which they were shipped.

\* Imperial Gazetteer, Indian Empire, Vol. III, p. 183.

TABLE No. 181.—Exports of turmeric in 1913-14 with the share of the principal ports.

Ports.	Quantity.	Value.
	Cwts.	£
Bombay . . . . .	49,719	44,991
Madras . . . . .	20,830	14,892
Calcutta . . . . .	15,854	10,465
Tuticorin . . . . .	9,086	5,796
Cochin . . . . .	7,003	3,947
Rangoon . . . . .	2,749	1,282
TOTAL (including other ports) .	115,027	87,450

There was a decline in exports in subsequent years, only 64,000 and 67,000 cwts. being shipped in 1914-15 and 1915-16, though a revival was experienced in the following year when over 103,000 cwts. left the country valued at £105,000. In 1917-18 and 1918-19 the quantities were 77,000 and 79,500 cwts. respectively. The trade has been gradually declining since then, the average exports in the four years ending 1922-23 amounting to no more than 53,000 cwts.

Shipment is made in bags containing 1½ cwt. nett from Cochin, 1½ cwt. from Madras, ½ cwt. from Calcutta and 1½ or 1¾ cwts. from Bombay.

The unit of sale in Madras is the candy of 500 lbs.

Unit of sale and shipment. and on the West Coast the candy of 600 lbs.

In Bombay it is the candy of 21 Bombay maunds and in Calcutta the bazaar maund.

#### Cutch.

Cutch or *khair* is derived from *acacia catechu* which is found in the Western Himalayas and in Burma. The tree is felled and the heart wood cut into little chips and boiled in a cauldron until the fluid attains the consistency of syrup when it is taken off and cooled. A ton of wood is said to yield 250 to 300 lbs. of cutch. As the trade is largely in the hands of small manufacturers and dealers no trustworthy returns are available regarding the output. In 1895-96 the total exports to foreign countries were 183,729 cwts. valued at £246,407, but since then the traffic has considerably declined. In a normal year Burma contributes a preponderating share of the whole, in which province a royalty is levied on exports at the rate of Rs. 4 per 100 viss of 360 lbs. The bulk of the consignments are usually made to the United Kingdom, other customers being France, Germany and Holland. The exports in 1913-14 and from 1918-19 onwards are shewn in the table below.

TABLE NO. 182.—Quantities and values of exports of catch \* in 1913-14 and from 1818-19 onwards.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	58,859	62,162
1918-19 . . . . .	58,125	77,189
1919-20 . . . . .	55,760	92,425
1920-21 . . . . .	39,386	58,204
1921-22 . . . . .	29,653	37,473
1922-23 . . . . .	39,328	50,816

\* Inclusive of small quantities of gambier for which no separate statistics are available.

The chief ports of export are Rangoon and Calcutta. In Calcutta prices are quoted per bazaar maund and shipment is made in cases of one cwt. gross or 84 lbs. nett. In Rangoon the unit of sale is the cwt. and shipment takes place in cases weighing 50 to 124 lbs. nett.

**Divi-Divi.**

The divi-divi (*caesalpinia coriaria*) is a tree introduced into India from South America about 80 years ago, the pods of which have a very high tanning content. The tree having become acclimatised in Southern India and parts of the Bombay Presidency, there was at one time considerable trade in these pods chiefly for internal consumption but this has latterly languished owing to falling prices which now scarcely pay for the cost of collection. Foreign exports from the Madras Presidency during the last quinquennium are shown in the following table.

Germany is once more in the market and took two-thirds of the total shipments in 1921-22, and half those of the following year. France which was formerly interested in this market has not received any consignments since 1916-17.

TABLE NO. 183.—Quantities and values of exports of divi-divi from the Madras Presidency with the share of the principal recipients.

Countries.	1918-19		1919-20		1920-21		1921-22		1922-23	
	Quantity.	Value.								
	Cwts.	£								
United Kingdom . . . . .	3,241	1,860	3,135	1,896	3,620	1,634	1,109	391	2,613	947
Germany . . . . .	..	..	..	..	500	224	3,486	1,127	2,709	835
Belgium . . . . .	..	..	..	..	..	..	..	..	198	185
Japan . . . . .	..	..	..	..	..	..	978	236	..	..

Exports in 1918-19 and 1919-20 amounted to 3,241 cwts. and 3,135 cwts., respectively and the entire quantity was taken by the United Kingdom.

The chief ports of export from Southern India are Cocanada and Madras. The unit of sale in the former port is the bag of 164 lbs. and in the latter the candy of 500 lbs. Shipment is made from Cocanada in bags of 82 to 92 lbs. nett and from Madras in bags of 100 lbs.

As in the case of myrobalans, there is an increased demand for divi-divi extracts from tanners in the United Kingdom in preference to unshelled nuts.

### RAW HEMP.

The term hemp is used to denote the fibre of at least three important varieties of plants, namely, *cannabis sativa*, *agave sisalana* and *crotalaria*

*juncea* which occur in India, but so far as her Trade varieties. export trade is concerned it is the last named known generally as *sann* hemp which ranks first in importance, while the *agave sisalana*, commercially known as *sisal* comes next. The fibre of *hibiscus cannabinus*, or *Deccan* hemp is better known perhaps as *Bimlipatam jute* from the port from which it is principally exported, and as it actually competes in certain classes of manufactures, e.g. heavy C's. with the products of Bengal mills, it is classified statistically with *corchorus* and has been dealt with already. No official forecasts of the hemp crops are published but in 1917 the Director of Statistics instituted a special inquiry to ascertain the area and estimated production in 1916-17, the results of which are tabulated below.

TABLE NO. 184.—Area and estimated yield of hemp in 1916-17.

Provinces.	Area.	Yield.
	Acres.	Cwts.
Madras . . . . .	197,900	1,230,680
Bombay and Sind . . . . .	150,900	997,097
Central Provinces and Berar * . . . . .	161,100	1,064,048
United Provinces . . . . .	176,900	947,475
Bengal . . . . .	32,300	189,372
Punjab . . . . .	49,200	181,078
Bihar and Orissa . . . . .	15,200	63,960
Burma . . . . .	600	1,467
North-West Frontier Province . . . . .	700	1,316
Delhi . . . . .	500	1,586
TOTAL . . . . .	785,300	4,678,679

\* No estimate of average yield being available, the outturn has been calculated at the rate for Bombay.

The true hemp *cannabis sativa*, though spoken of commonly as *Indian hemp*, is probably not indigenous to India, but once introduced has been extensively cultivated, not so much for the fibre it yields

as for the narcotic in the form of either *bhanga*, *charas* or *ganja*, derivable from it. As a source of hemp fibre it is now grown in two chief localities—(1) the North-West Himalaya, including Garhwal, Kumaon, Nepal, Simla, Kangra and Kashmir, and to a much smaller extent, (2) in Sind.

Botanical and historical evidence, on the other hand, points to *crotalaria juncea* being indigenous to India and at a time when the value

of jute as a fibre had not been commercially recognised, it received the early attention of the East India Company who procured their supplies from Salsette near Bombay and made attempts to introduce it into England as a substitute for Russian hemp. It is now widely grown in Bombay, the Central Provinces and the United Provinces. Of the 200,000 acres devoted annually to the crop in Southern India, the chief districts producing the fibre are the Godavari, Kistna and Tinnevely districts of the Madras Presidency, and Hyderabad State, but it is grown for cattle fodder as well as for fibre. Throughout India it is grown as a *kharif* crop, i.e., sown about the commencement of the rains and cut at the end of September or beginning of October. The fibre is obtained by retting the stems in water bruising with stones, and re-soaking until the fibre strips off easily. The average yield of fibre ranges from 500 to 800 lbs. per acre and it has been calculated that the percentage of fibre to dry stem is about 8. The *sann* hemp exported from Calcutta is classified for trade purposes as (1) *Benares*, (2) *Green* or *Raigarh*, and (3) *Bengal*, the bulk of the shipments being made between October and May. The pre-war shipments of Benares *sann* hemp averaged about 85,000 bales of 350 lbs. each. The Bombay trade amounted in normal times to about 80,000 pressed bales of 3½ cwts. each, the principal trade descriptions being *Pilibhit* (*United Provinces*), *Central Provinces* (including *Itarsi* (*Seoni*) and *Jubbulpore*), *Devgad* and *Gulbarga*. All descriptions are hackled or combed in Bombay and shipped under private marks as *combed* or *tow*, the latter term being applied to the short ends of the hemp which are put to special uses in certain trades such as shipbuilding. The chief grades shipped from Madras ports arranged in order of relative importance are—(1) *Cocanada*, (2) *Gopalpur*, (3) *Warangal*, and (4) *Upper Godavari*. Except in the case of Gopalpur the colour is generally uniform, but shorts and tow are graded separately.

*Sann* hemp is a fibre of the same class as flax and much superior in durability to jute, and if flax spinning machinery were introduced, there is reason to hope that the production in India of all the coarser materials, such as hose pipes, belting and canvas for which the country has hitherto depended on imported flax manufactures might be commercially successful. Hitherto all the exports of *sann* hemp have been in the form of raw fibre.

*Sisal* hemp is obtained from the spiny leaves of *agave sisalana*, which is commonly grown as a hedge in many parts of India, particularly on railway lines. The exploitation of the plant on a commercial scale has been attempted in Sylhet, Tirhoot, Bombay, and Southern India, but probably because the right species was not cultivated, these efforts have generally proved unsuccessful. In the Mysore State where there is land suitable for its cultivation, experiments have been made with the true *henequen* hemp of Yucatan (*agave rigida* var. *sisalana*) and ryots encouraged to grow it, but so far without appreciable success from a commercial point of view.

The bulk of the shipments of raw hemp of which statistics are given overleaf has hitherto consisted of *sann* hemp.

Exports.

TABLE NO. 185.—Quantities and values of hemp exported in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	711,548	682,319
1918-19 . . . . .	489,420	978,641
1919-20 . . . . .	742,109	1,262,731
1920-21 . . . . .	407,951	574,366
1921-22 . . . . .	256,203	262,384
1922-23 . . . . .	412,443	405,648

In 1913-14 the distribution among the provinces was as follows: Bengal 429,469 cwts., Bombay 224,790 cwts. and Madras 57,289 cwts.; and in 1922-23: Bengal 269,487 cwts., Bombay 113,598 cwts. and Madras 29,358 cwts. The United Kingdom before and during the war was the principal individual customer for *sann* hemp, but considerable quantities always went to the Continent. Owing to the failure of the Italian crop whence the greater part of her requirements is normally found, Belgium in 1922-23 assumed for the first time the premier position, and Germany's receipts were almost up to pre-war standards.

TABLE NO. 186.—Distribution of the trade in hemp among principal importing countries in 1913-14 and in 1922-23.

Countries.	1913-14.		1922-23.	
	Quantity.	Value.	Quantity.	Value.
	Cwts.	£	Cwts.	£
United Kingdom . . . . .	297,444	294,894	101,444	106,878
Belgium . . . . .	140,221	129,090	158,199	142,616
Italy . . . . .	103,333	97,789	570	671
France . . . . .	69,242	61,006	33,082	34,385
Germany . . . . .	68,341	69,408	58,841	60,255
Greece . . . . .	7,887	6,870	1,127	1,083
Denmark . . . . .	7,639	6,806	3,690	6,312
Other countries . . . . .	17,441	16,656	55,490	53,448

The question of adulteration was taken up by the London Hemp Association in 1913 with the Government of India, who pointed out in their reply that buyers should insist upon getting the clean article and be prepared to pay higher prices for it. In 1916 the question was raised again by the Board of Trade who suggested to the India Office that grading might be controlled by legislation. This the Government of India pointed out would be a matter of considerable difficulty as so many different gradings are recognised in the Indian trade. The private marks of the bigger shippers carry with them a sufficient guarantee of consistent grading to satisfy most buyers, and hackling or combing as practised particularly at Bombay gets rid of the dust and dirt due to

retting in dirty water. Unfortunately no suitable machinery has yet been devised and the fibre has all to be hand hackled, but the higher prices commanded for combed hemp have given a considerable impetus to this treatment.

From Madras ports shipment is usually made in steam-pressed bales of 400 lbs. each, lashed with rope, and the 500 lb. candy is the recognised unit of sale. The bulk of the South Indian exports is shipped from Cocanada.

**Unit of sale and shipment** In Bombay it is sold per candy of 25 Bombay maunds and shipped in bales weighing from 336 to 392 lbs. The unit of sale as well as of shipment in Calcutta is the bale of 400 lbs. though the bale of 350 or 375 lbs. is also recognised. Quotations for export are generally per ton, *c.i.f.*

There have always been considerable imports of raw hemp into India, chiefly of Manilla hemp from the Philippines. There are two mills in Calcutta which make rope and twine, but only one of these utilizes imported fibre.

**Imports.** Between 1913-14 and 1917-18 the value of these imports averaged about £69,000 but in 1918-19 it rose to nearly £171,000. The total for 1922-23 was £38,000 only. In addition, there are not inconsiderable imports of manufactured hemp, chiefly canvas and hemp rope from the United Kingdom and the Straits Settlements.

## MINERAL OILS.

The production of petroleum in India increased from 118½ million gallons in 1904 to 277½ million gallons in 1913 and to 305½ million gallons

**Production.** in 1921, due chiefly to the greater productivity of the Yenangyaung and Singu fields in Burma, which contributed 288½ million gallons to this total. In 1922, however, there was a decrease in output of over 7 million gallons, the total production being just under 300 million gallons. With an enormous Indian market adjacent, in which the use of kerosene for domestic consumption in supersession of vegetable oil illuminants has been assiduously exploited by competing interests, the export trade has always been comparatively small; and practically confined to benzine or petrol in bulk, fuel oil and lubricating oil. The Indian demand for kerosene now exceeds even the greatly increased Burma supply, and the volume of foreign imports has remained fairly steady in the neighbourhood of 50,000,000 gallon annually during the last three years.

In 1910-11 the exports scarcely exceeded 2½ million gallons, but they rose in the following year to nearly 15 and aggregated in 1913-14 22 million gallons, valued at £142,000, as compared with the coasting trade of 119 million

**Exports.** gallons, valued at £2,840,000. The foreign trade in fact consisted largely of benzine, though oil fuel for the Navy and lubricating oil which, prior to 1st April 1914, were also included in the same statistical head helped to swell the total. Since 1910-11 there have been practically no foreign shipments of kerosene. In 1914-15 over 20 million gallons of benzine, benzol, petrol and other motor spirit were exported to the United Kingdom and the shipments in the following year (all to the United

Kingdom) exceeded £150,000, in value. The exports, foreign and coast wise, other than from Burma, are negligible. Military requirements, chiefly of petrol, in Mesopotamia were largely met by re-export from Bombay to Persian Gulf ports and therefore do not figure in the statistics of foreign exports from Burma, though from 1917 until the end of the war there were considerable direct shipments to Egypt from Rangoon. In 1918-19, 24,845,000 gallons were exported, and in 1919-20 37,854,000 gallons, France and Italy being large recipients, and more than twelve million gallons going to Egypt 'for orders.' The totals for 1920-21 and 1921-22 respectively were 19,648,000, and 22,714,000 gallons. In the following table the distribution of the trade in 1913-14 and in 1922-23 is contrasted.

TABLE No. 187.—*Distribution of the trade in mineral oils in 1913-14 and 1922-23 contrasted.*

Countries.	1913-14.		1922-23.	
	Quantity.	Value.	Quantity.	Value.
	Gallons.	£	Gallons.	£
United Kingdom . . . . .	15,268,640	93,014	9,254,683	694,119
Holland . . . . .	3,066,663	19,167	5,618,514	421,398
United States of America . . . . .	2,308,700	18,254	..	..
Germany . . . . .	922,586	5,772	..	..
Australia . . . . .	40,084	2,567	..	..
Ceylon . . . . .	39,644	1,690	33,928	2,364
Straits Settlements . . . . .	32,406	1,143	63,826	4,497
TOTAL (including OTHER COUNTRIES.)	22,308,700	142,732	19,957,738	1,490,765

The arrangements under which foreign consignments of benzine are marketed make it impossible to say, until some month after shipment, what price has actually been realized. In 1913-14 values were calculated at the conventional rate of 1½ annas (1½d.) per gallon, the declared value at the time of export, but from 1919-20 onwards the price adopted has been that current for wholesale shipments to India less excise duty. The enormous increase in values recorded in the above table is therefore largely discounted.

The unit of sale in Burma of fuel oil is the ton of 2,240 lbs. and of other oils the gallon.

An excise duty of 6 annas (6d.) a gallon was imposed by legislation in 1917 upon all motor spirit produced in India and Burma, and a corresponding duty of the same amount upon foreign imports. The proposal of the Government of India in March 1924 to reduce this to 4½ annas (4½d.) was unacceptable to the Legislative Assembly. An excise duty of 1 anna (1d.) per gallon is levied on kerosene.

#### FISH OIL.

Until the Madras Department of Fisheries interested itself in the matter, the large quantities of sardines (*clupea longiceps*) constantly shoaling on the Malabar Coast were converted

Production. into manure by the wasteful and offensive method of sun-drying on the open beach as they contain too much oil to be cured for edible purposes. In 1909 the Fisheries Department introduced a new and simple process for the extraction of the oil, the

fish being boiled in open iron vats, and the resultant mass bagged and put into a hand screw press. The residue known as 'fish guano' makes an excellent fertiliser, which is shipped largely to Ceylon though there is a market for this cake also in the planting districts of South India; while the oil is in demand for jute batching, candle and soap making and for paints. Every ten tons of sardines treated should yield  $1\frac{1}{2}$  tons of fish oil and  $1\frac{1}{2}$  tons of dry fish guano. In the last two decades upwards of 250 small factories have been erected along the coast for treating sardines in this manner, the output of which is said to be in the neighbourhood of 6,000 tons annually. In the better equipped factories steam heating is employed and a clear yellow oil with a high stearine content is obtained. Over open fires the oil yielded is very dark in colour.

TABLE No. 188.—Exports of fish oil and fish guano from the West Coast of the Madras Presidency from 1913-14 onwards.

Year.	FISH OIL.		FISH GUANO.	
	Quantity.	Value.	Quantity.	Value.
	Gallons.	£	Tons.	£
1913-14 . . . . .	367,382	14,639	4,726	26,919
1914-15 . . . . .	220,839	7,952	102	517
1915-16 . . . . .	29,853	1,503	294	2,294
1916-17 . . . . .	10,444	425	1,016	8,902
1917-18 . . . . .	27,680	1,272	961	6,115
1918-19 . . . . .	124,542	6,577	7,328	29,028
1919-20 . . . . .	166,859	8,101	9,235	89,068
1920-21 . . . . .	52,150	2,563	4,767	45,272
1921-22 . . . . .	13,788	770	3,007	31,647
1922-23 . . . . .	103,336	5,119	8,569	71,823

The fall in exports in 1912-13 and in the years 1915-16 to 1917-18, 1920-21, and 1921-22 was due to the scarcity of sardines. Cochin, Calicut, and Mangalore are the chief ports of export. The principal destinations of the oil exported are the United Kingdom and Ceylon and to a smaller extent the Persian Gulf ports, though previous to the war, Germany and Belgium absorbed considerable quantities. Exports to Germany have revived since February 1923.

The unit of sale of the oil on the West Coast is the ton or the maund of 28 lbs., shipment being made in tins of 35lbs. or casks weighing  $3\frac{1}{2}$  and  $6\frac{1}{2}$  cwts.

#### LEMON GRASS OIL.

The extraction of the essential oil contained in lemon grass (*Cymbopogon flexuosus*) is an industry of considerable promise in Southern

India as the oil which contains a large percentage of *citral* is utilized largely in the manufacture of soaps and artificial scents. Cultivation may be described as a monopoly of the West Coast of the Madras Presidency, the main producing areas being the Indian States of Travancore and Cochin and the southern part of the Malabar district. Lemon grass is both wild and cultivated. The hill sides on which it flourishes are fired in January. The first crop is ready to be harvested in July and the season for distillation extends to October, furnaces and stills being set up in the neigh-

bourhood of the plantations. The method of distillation is generally crude, and the resultant oil highly coloured and so adulterated that the citral content seldom exceeds 50 per cent as compared with 83 per cent in the pure article. The trade which was inconsiderable until the beginning of the present century received a great impetus about 1903-04, but the temptation of high prices encouraged crude methods of distillation and subsequent adulteration, and when the demand in Europe was discovered to be unequal to the absorption of the quantity which Travancore and Malabar were prepared to export, a fall in prices which followed made distillation scarcely profitable. There was some revival again before the war both in prices and in the volume of the trade, and private efforts, supplemented by those of the Travancore Darbar to obtain a better quality of oil have proved that there is a steady and increasing demand in Europe and America for the purer product which is yielded by redistillation. Travancore oil used in pre-war times to be shipped either from Alleppey or Cochin, but no export statistics are available for the former port. The quantities that went forward from ports in British India, mainly Cochin, in the pre-war year and the last five years are shewn in the following table.

TABLE No. 189.—Quantity and value of lemon grass oil exported in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Gallons.	£
1913-14 . . . . .	47,522	67,085
1918-19 . . . . .	17,049	22,181
1919-20 . . . . .	30,957	65,497
1920-21 . . . . .	39,726	108,220
1921-22 . . . . .	43,737	61,229
1922-23 . . . . .	53,033	64,844

The principal pre-war destinations were France, which accounted for more than 50 per cent of the total, Germany, the United Kingdom and the United States, and the war did not cause any material alteration in the distribution of the trade except that Germany was eliminated and a new market apparently found in Switzerland. During the post-war period France, the United States, and the United Kingdom have maintained their position as the principal recipients, and Germany has made her re-appearance. In 1922-23 France took 45 per cent of the total exports, the United States 19, the United Kingdom 17, and Germany 7.

The unit of sale on the West Coast is a dozen bottles of 22 oz. each, the unit in Madras being the lb. Shipment is usually made in cases containing a dozen bottles, or in drums containing the equivalent of 20, 23, 45 or 60 dozen bottles.

#### MANURES.

The Indian cultivator is generally too poor and his holding too small to make intensive manuring profitable. Green manuring is common and

the benefits to the soil from the cultivation of nitrogenous plants is not unrecognised, but dried cow dung which is the commonest manure available is too commonly preferred as fuel for domestic purposes. The chief internal demand for manures is therefore from the tea and coffee planting industries for whom, in addition to the supplies available in the country, over 8,000 tons of artificial and mineral manures were imported in 1913-14.

Of the animal manures produced in India, the principal are derived from fish and bones. The fish manure industry on the Malabar Coast

has already been separately noticed \* The total exports from India of fish manure (including an inconsiderable quantity of guano derived from the excrement of birds and bats) are shewn in the table below. Prices, it will be noticed, though falling, are still much above those current ten years ago.

TABLE NO. 190.—Quantity and value of fish manure and guano exported in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14	16,284	£4,044
1918-19	18,185	143,415
1919-20	35,909	334,580
1920-21	12,137	114,555
1921-22	9,457	96,083
1922-23	18,536	151,266

More than half of the total is contributed by Madras, Burma being the most important of the remaining provinces. Shipments are mainly directed to Ceylon and the Straits Settlements.

The unit of sale in Madras is the cwt., the ton or the candy of 600 lbs. and shipment is made in bags of  $\frac{1}{2}$  or one cwt. or of  $2\frac{1}{2}$  qrs. In Burma sales are based on a hundred viss of 360 lbs. and the manure is shipped in bags of 280 lbs. nett.

There was a considerable demand before the war for crushed bones in France and Belgium for the manufacture of bone-black, buttons, etc.

Bone meal was also exported in pre-war days to Hamburg, while a coarser quality went to Liverpool and Hull for the manufacture of superphosphates. The war which cut off India from external supplies encouraged the internal demand. In 1921 there were 19 bone crushing mills in existence in British India worked by mechanical power, four in Bombay eight in Bengal, three in Madras, two in the Central Provinces, and one each in Burma and the United Provinces.

The following table (which does not however distinguish crushed bones from meal) shews how the trade was distributed in 1913-14 and during the last five years. Since 1919-20 the volume of exports has been remarkably steady.

\* Vide p. 274.

TABLE NO. 191.—Quantity and value of exports of bones and bone meal from India in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	105,413	522,233
1918-19 . . . . .	16,734	84,499
1918-20 . . . . .	83,693	502,342
1920-21 . . . . .	99,148	667,033
1921-22 . . . . .	89,005	613,850
1922-23 . . . . .	84,571	605,590

The provincial distribution of the trade in the last pre-war year was as follows :—Bengal 43,337 tons, Sind 25,606 tons, Bombay 25,364 tons, Madras 9,425 tons and Burma 1,681 tons, the chief destinations being Belgium, France, United Kingdom, Japan and Germany. In 1922-23 the provincial distribution was : Sind 34,580 tons, Bengal 32,384 tons, Madras 23,848 tons, Bombay 13,884 tons, and Burma, 5,363 tons, the chief destinations being Belgium, which took 27 per cent of the total exports, and Ceylon, which took 24 per cent. The bulk of the balance went to the United Kingdom, Japan, Germany, the United States, and France.

The unit of sale in Calcutta, Bombay and Madras is the ton of 2,240 lbs. though Karachi sells on the standard maund. In the case of bone meal prices are quoted per mesh of  $\frac{3}{8}$ ",  $\frac{1}{4}$ ",  $\frac{3}{16}$ ",  $\frac{3}{16}$ " and  $\frac{1}{8}$ ". In the case of crushed bones the range is from  $\frac{1}{8}$ " to  $\frac{3}{4}$ " mesh. Shipment is effected from Bombay in bags of 168 lbs. and from Karachi in bags weighing 168, 200 and 224 lbs. nett. In Calcutta bone meal, steamed and unsteamed, and crushed bones are exported in bags of 224 lbs. nett. From Madras ports these are shipped in one cwt. or two cwt. bags.

There are also considerable exports of dried blood obtained from the slaughter houses in the big cities such as Calcutta, Madras and Bombay, the trade name for which is 'bloodmeal.' 800 tons were shipped to Ceylon in 1922. Dried blood is sold per unit of nitrogen 10 to 12 per cent, animal meal 8 to 10 per cent nitrogen and horn meal 12 to 13 per cent nitrogen.

There is a demand for inferior saltpetre, either unmixed or mixed with bone meal for manurial purposes, particularly in Ceylon. The only other mineral manures exported in any quantity are sulphate of ammonia, sulphate of potash and kainit.

**Mineral manures.**

The annual production of sulphate of ammonia in India at the present moment is estimated to be 3,000 tons only, chiefly for the export trade, the total quantity shipped in 1922-23 being about 2,000 tons valued at £36,000. The entire quantity was shipped from Bengal, and Java, where it is required for sugarcane cultivation, was the main recipient. The unit of sale is generally the ton and shipment is made in bags of 2 cwts. nett.

Of the other manures exported from India, the principal are oilcakes, the chief items being linseed, castor, groundnut, sesame and rape cakes.

Other manures. These have already been dealt with in the respective articles on seeds.

## SPICES.

### Pepper.

The trade in pepper is perhaps the oldest, and during the Middle Ages was one of the most important branches of commerce between Europe and the East. Then and even earlier the West Coast of India enjoyed a practical monopoly, there being evidence that it was flourishing as early as the fifth century A.D., but by the beginning of the nineteenth century the competition of the Malay Archipelago had proved too strong and it had lapsed into comparative insignificance. Yet even now the average value of the exports from the Malabar Coast ports approximates to £250,000 a year.

Pepper is the berry of a vine-like climbing plant (*piper nigrum*) which grows wild in the forests of Malabar and Travancore and is extensively cultivated by Europeans and Indians in and below the Western Ghats from Karwar to Cape Comorin. It thrives in a hot, moist climate with an abundant rainfall. In Bengal, pepper is grown to a very limited extent only in the northern parts of Jessore, while in Assam, except in Sylhet and the southern slopes of the Khasia Hills, very little is produced. In Bombay the area under the crop in 1904-05 amounted to 6,736 acres and in 1905-06 to 7,483, practically the whole of which was in Kanara. In Madras, the principal producing areas are Malabar, Cochin and Travancore, and, to a small extent, Coorg and South Kanara. The vines are usually propagated from cuttings and the first crop is obtained in the third year, the berries ripening in March. A vine in full bearing in a good year will carry about 1,000 clusters of fruit yielding 4 lbs. of dried pepper.\* The yield from some of the Kanara gardens in the Bombay Presidency is probably rather higher. The life of a vine is about seven years. To obtain *white* pepper the berries after being plucked are soaked in water for seven or eight days until the pulp ferments. The mass is then trampled under by *coolies* to remove the pulp from the stone, and sun-dried. Little or no *white* pepper is produced in India. *Black* pepper is derived from the unripe berry picked green, heaped and dried when the skin and pulp adheres as a wrinkled covering to the stone. Two grades of quality are known on the West Coast, *viz.*, *Alleppey* and *Tellicherry*, of which the latter in normal times commands a slight premium over the former, as the pepper is bolder and heavier.

The total exports of Indian pepper during the period 1900-1907 averaged 12,000,000 lbs. valued at about £275,000. In 1913-14, 13,880,000 lbs. valued at £290,000 (average value 5*d.* per lb.) were exported. The variations of the trade between 1913-14 and 1922-23 are illustrated by the table below.

#### Exports.

\* Imperial Gazetteer. The Indian Empire, Vol. III, page 64.

TABLE No. 192.—Quantity and value of pepper exported from India in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.	Average value per lb.
	Lbs.	£	d.
1913-14 . . . . .	13,879,964	289,943	5'0
1918-19 . . . . .	12,846,746	408,889	9'0
1919-20 . . . . .	13,655,824	436,097	7'7
1920-21 . . . . .	5,402,096	136,685	6'1
1921-22 . . . . .	11,847,472	206,900	4'2
1922-23 . . . . .	12,737,088	232,717	4'4

The average value, it will be noticed, has been steadily decreasing since the armistice and is now below the pre-war figure.

The chief importing countries in the last pre-war year and in 1922-23 are shewn in the following table.

TABLE No. 193.—Distribution of the trade in pepper among principal importing countries in 1913-14 and 1922-23 *contra*.ed.

Countries.	1913-14		1922-23	
	Quantity.	Value.	Quantity.	Value.
	Lbs.	£	Lbs.	£
Germany . . . . .	3,110,541	64,571	398,832	6,654
Italy . . . . .	2,896,660	60,730	4,384,800	74,240
United States of America . . . . .	2,352,228	45,973	3,921,008	63,556
United Kingdom . . . . .	1,579,274	32,399	780,416	13,108
Asiatic Turkey . . . . .	802,506	19,690	..	..
France . . . . .	758,156	14,722	364,000	6,042
Persia . . . . .	454,564	10,798	433,440	11,781
Austria . . . . .	330,400	6,817	11,200	187
Hungary . . . . .			..	..
Arabia . . . . .	272,478	5,936	247,632	5,212
Holland . . . . .	251,420	4,808	44,800	667
Canada . . . . .	156,800	3,047	117,600	1,947

The shipments to Germany in 1913-14 were unusually heavy. Pepper, we have since learnt, is an ingredient in the manufacture of tear shells. In 1922-23 Italy and the United States took, 34 and 31 per cent, respectively, of the total exports. Tellicherry pepper which is derived from two varieties of vine known in the vernacular *kalluvalli* and *Balankotta* is not only shipped from Tellicherry, but also from the neighbouring ports of Calicut, Cannanore and Badagara, while Cochin, Alleppy and Tuticorin are the outlets for the pepper grown in the Cochin and Travancore States. The distribution of the trade in 1913-14 and 1922-23 among the provinces is given in the table sub-joined. Even in pre-war days the exports credited to Bengal were probably of South Indian origin, and her participation in the trade was during the last years of the war much enhanced temporarily owing to the greater facilities for freight obtaining at Calcutta.

TABLE No. 194—*Distribution of the trade in pepper among the various provinces in India in 1913-14 and 1922-23 contrasted.*

Provinces.	1913-14		1922-23	
	Quantity.	Value.	Quantity.	Value.
	Lbs.	£	Lbs.	£
Madras . . . . .	12,065,786	246,177	10,479,728	173,376
Bombay and Sind . . . . .	1,839,772	40,780	2,194,976	57,346
Bengal . . . . .	123,734	2,959	61,600	1,980
Burma . . . . .	672	27	784	15
<b>TOTAL . . . . .</b>	<b>13,879,964</b>	<b>289,943</b>	<b>12,737,088</b>	<b>232,717</b>

Pepper is packed for export from West Coast ports in bags of 1½ cwts. nett, from Bombay in bags of 70, 168 and 196 lbs. nett and from Calcutta in bundles of 224 lbs. nett. The unit of sale and shipment. In Tellicherry is the cwt. and in Cochin the 600-lb. candy. Bombay sells on the candy of 21 Bombay maunds and Calcutta on the bazaar maund.

In addition to the foreign trade, movements by rail and river and coastwise by sea between the provinces for internal consumption have always been considerable. During the five

**Imports.** years ending 1921-22 the coastwise imports by sea averaged 16 million lbs., of which Calcutta took 2½ million and Bombay 11½ million lbs. Imports from foreign countries were mainly from the Straits Settlements, the total quantity in 1920-21 being 1,072,000 lbs., in 1921-22, 1,206,000 lbs. and in 1922-23, 1,058,000 lbs.

### Chillies.

Originating in tropical America and introduced into India somewhere about the middle of the seventeenth century by the Portuguese, there are at present many varieties of *capsicum* disseminated over large tracts in India, both as

**Cultivation.** garden and field crops. No separate statistics of production or of acreage are available but in Madras, the province with by far the largest production, the area has been estimated at not less than 300,000 acres annually; and while the distribution is pretty general, cultivation is particularly large in the Guntur district and the uplands of Godavari and Kistna. Outside Madras the chief producing areas are in Eastern and Northern Bengal, in the Kayaukse, Sagaing and Myingyan districts of Burma and in Bombay where there is extensive garden cultivation particularly in the Dharwar, Belgaum, Khandesh, Satara, Poona and Sholapur districts. To a limited extent the crop is raised in the Punjab, where when grown at an elevation, the chillies are said to acquire a greater pungency to which perhaps is due the popularity of the so-called 'Nepal' cayenne. The yield is subject to great variations in different localities.

The pods are sun-dried and packed for the market in Southern India in gunnies each containing 70 to 75 lbs., or in bags weighing 168 lbs.

**Unit of sale and shipment.** gross. For export the unit of sale is the candy of 500 lbs generally, although in Tuticorin it is the *tulam* of 15 lbs. In Bombay the sale is on the basis of a candy of 21 Bombay maunds, and in Calcutta of the bazaar maund, shipment being made from the former port in bundles of 196 lbs. nett and from the latter in bags of 205 lbs. The unit of sale in Rangoon is a hundred viss of 360 lbs. and chillies are packed for export in bags weighing from 48 to 112 lbs. nett.

Of course the bulk of the chillies grown disappears in local consumption as an ingredient in curries, chutneys and other food preparations. The dried fruit reduced to powder

is the red pepper or cayenne of commerce. The export trade does not greatly interest any large firms and the business is chiefly in the hands of Indians with branches or correspondents in Ceylon and the Far East. The distribution and volume of the trade varies little from year to year. The average shipments have for a long time been in the neighbourhood of 15 million lbs. a year but in 1918-19 the total was only 9,217,000 lbs. due to failure of this crop in the Guntur District of the Madras Presidency and the consequent restrictions placed upon export to prevent depletion of stocks for local consumption. In 1921-22 and 1922-23 the exports were 16,064,000 lbs. and 18,116,000 lbs., respectively. In the following table the quantities and values of chillies exported in 1913-14 with the shares of the principal recipients, are contrasted with those in 1922-23. Values have appreciated in the last ten years by over 100 per cent.

TABLE NO. 195.—Share of the principal importing countries of chillies in 1913-14 and 1922-23 contrasted.

Principal countries.	1913-14		1922-23	
	Quantity.	Value.	Quantity.	Value.
	Lbs.	£	Lbs.	£
Ceylon . . . . .	10,674,719	90,813	11,588,752	209,360
Straits Settlements . . . . .	3,552,346	28,474	3,760,288	64,894
United States of America . . . . .	680,284	5,218	1,227,968	23,574
Italian East Africa . . . . .	380,988	3,181	5,736	147
Mauritius and dependencies . . . . .	280,483	2,048	345,836	6,221
Aden and dependencies . . . . .	204,036	1,671	112,224	2,080
United Kingdom . . . . .	9,789	93	459,684	10,012
Other countries . . . . .	310,440	2,722	612,080	13,889
<b>TOTAL</b> . . . . .	<b>16,103,085</b>	<b>134,220</b>	<b>18,115,888</b>	<b>330,177</b>

The only noticeable alteration in the course of the trade during the war was the transitory interest taken by the United Kingdom which took 10,000 lbs. only in 1913-14, while her total for 1916-17 was 1,108,000 lbs. Since the war very nearly 44 per cent of the exports have gone from Bengal and 38 per cent from the Madras Presidency, the principal ports concerned being Calcutta, Tuticorin, Negapatam, and Madras. Ceylon and the Straits Settlements continue to be the chief recipients.

### Ginger.

Ginger (*zinziber officinale*) has been cultivated in India for centuries, but no statistics as to area of cultivation or outturn are available. On the Malabar Coast which has long been famous for its ginger, cuttings are planted in May and the rhizomes dug up in the following November. Other parts of India where there are considerable quantities grown are the Surat and Thana districts of the Bombay Presidency, the Rangpur district in Bengal and the Kumaon district of the United Provinces. In a good year 2,000 lbs. of dry ginger to the acre is a fair average yield. The rhizomes are purchased from the cultivator by dealers who either sell them again as *green* or *dried* ginger. Dried ginger again is either *bleached* or *unbleached* according as it is parboiled or scraped before being exposed to the sun. Uncoated (*i.e.*, scraped) Cochin ginger is reputed the best marketed in India.

The export trade does not attain to any great dimensions, but ginger is to be found in almost every bazaar and the internal consumption for curries and medicinal purposes must be very great. The chief external markets for Indian ginger are as in pre-war times the United Kingdom, the United States of America, Aden, Arabia, Turkey, Ceylon and Germany. Ginger is usually packed for export from Cochin and Calicut in double gunnies containing 1 to 1½ cwt. nett, or bags containing 126 lbs., the unit of sale at the former port being the candy of 600 lbs. and at the latter the cwt. From Calcutta it is shipped in bags of 2 maunds and from Bombay in bags of 100, 112 and 168 lbs. nett, though sales are made on the basis of the cwt. at the latter port. In the table below are shewn the quantity and value of ginger exported during the last ten years.

**Exports.**

TABLE No. 196.—Quantity and value of exports of ginger from 1913-14 onwards.

Year.	Quantity.	Value.
	Lbs.	£
1913-14 . . . . .	9,214,471	122,661
1914-15 . . . . .	7,529,188	87,321
1915-16 . . . . .	6,289,699	71,351
1916-17 . . . . .	6,181,502	84,338
1917-18 . . . . .	7,027,130	111,632
1918-19 . . . . .	3,542,577	65,707
1920-21 . . . . .	7,707,504	143,658
1921-22 . . . . .	5,929,952	100,543
1921-22 . . . . .	8,330,856	130,740
1922-23 . . . . .	5,817,962	118,657

Of the quantity exported in 1913-14, 4,220,551 lbs. went from Bombay, 3,158,653 lbs. from Calicut, 1,275,421 lbs. from Cochin and 314,356 lbs. from Calcutta. The substantial decline in the volume of shipments in 1918-19 is attributed chiefly to the greatly reduced tonnage available at West Coast ports in that year. The total shipments for the Madras

Presidency in 1918-19 aggregated less than 800,000 lbs. During the four years 1919-20 to 1922-23 the volume of exports averaged 6,949,000 lbs., to which Bombay contributed 67 per cent and Madras Presidency 32 per cent. The improvement recorded in 1921-22 is due to larger shipments to the United Kingdom and the United States of America.

While India exports on an average about 7,000,000 lbs. of ginger every year, her imports aggregate 1,385,000 lbs., chiefly from Japan into Bombay and Calcutta.

#### Imports.

#### Cardamoms.

The cardamoms which enter in the export trade of India are obtained from the capsules of a perennial herb (*eleteria cardamomum*) indigenous to the humid forests of Western and Southern India where it is extensively cultivated

#### Cultivation.

There are about 20,000 acres under cardamoms in the Madras Presidency (chiefly the Malabar and Madura districts), Mysore, Coorg and Travancore and 5,000 acres in Bombay (chiefly in the Kanara district). The normal outturn per acre varies from 50 to 250 lbs. and a great deal is consumed in India as well as considerable imports from Ceylon. Two varieties of cardamoms are recognised, *Mysore*, round, smooth-skinned capsules and *Malabar*, long, rough-grained capsules, known as *shorts* and *short longs*. The former are preferred and command a higher price.

Cardamoms are chiefly used for medicinal purposes, for flavouring cakes and liquors and as an ingredient in German sausages. The essential oil used medicinally as a carminative and in connection with perfumery in France and the United States of America is derived not from the Malabar nor Mysore cardamom, but from the so-called 'greater cardamom' of Nepal (*amomum subulatum*).

#### Uses.

The capsules which ripen in September and October are hand-gathered and sent down to the ports, and while some are dried and bleached in the sun before export, better qualities are generally cured more elaborately. After being

#### Method of marketing.

sulphur-bleached the stalk end of each pod is carefully clipped and the capsules are then graded. Such cardamoms usually fetch in London about double the price per lb. of the less carefully prepared pods. In some quarters there has been an increased demand lately for dried green cardamoms which are supposed to be more highly flavoured than the bleached cardamoms. Cardamoms which are packed for export from Madras ports in cases of one cwt. and bags of 126 or 140 lbs. are usually consigned for sale to London auction rooms. The pre-war quotation *f. o. b.* West Coast was about Rs. 30 (£2) per maund of 25 lbs. Prices have been affected in recent years by over production. The unit of sale in Bombay is the *Surti* maund of 39.2 lbs. and shipment is made in bags containing 160 to 175 lbs. nett. The following table shews the chief ports of export and the proportionate share of the trade enjoyed by each in the year preceding the outbreak of war and in 1922-23.

TABLE NO. 197.—Share of the ports in exports of cardamoms in 1913-14 and 1922-23 contrasted.

Port.	1913-14		1922-23	
	Quantity.	Percentage.	Quantity.	Percentage.
	Lbs.		Lbs.	
Bombay . . . . .	191,769	51	308,872	79
Calcutta . . . . .	63,905	17	8,848	2
Tuticorin . . . . .	55,915	15	26,096	7
Calicut . . . . .	19,732	5	32,368	8
Tellicherry . . . . .	17,362	4	112	.03
Mangalore . . . . .	12,639	3	...	...

Exports from Calcutta were in 1913-14 considerably above the average, owing to greater facilities for shipment, large quantities being railed up from the West Coast for despatch from this port.

The next table shews the foreign trade, quantity and value, from 1913-14 onwards.

TABLE NO. 198.—Quantity and value of cardamoms exported from India from 1913-14 onwards.

Year.	Quantity.	Value.
	Lbs.	£
1913-14 . . . . .	373,401	49,994
1914-15 . . . . .	413,135	54,369
1915-16 . . . . .	482,764	45,597
1916-17 . . . . .	311,790	32,400
1917-18 . . . . .	893,186	80,221
1918-19 . . . . .	641,650	51,605
1919-20 . . . . .	1,854,048	176,388
1920-21 . . . . .	637,504	58,313
1921-22 . . . . .	608,272	51,610
1922-23 . . . . .	390,768	37,468

Though the volume of exports from Madras ports declined from over 100,000 lbs. in 1913-14 to 21,000 lbs. in 1917-18, very large shipments from Calcutta and Bombay, chiefly to the United Kingdom, raised the all-India total in the latter year to nearly three times that for 1916-17, and shipments in 1919-20 were phenomenal, though values were below pre-war rates. In the triennium 1920-21 to 1922-23 exports of cardamom have averaged 545,000 lbs. only of which the United Kingdom has taken 52 per cent. The other principal direct customers for Indian cardamoms are Aden, Arabia, Egypt, the Straits Settlements, Persia and the United States.

#### Betelnuts.

The betelnut, which is the fruit of the areca palm (*areca catechu*), forms in conjunction with the leaf of the betel vine (*piper betle*) and a little lime

and clove or nutmeg, the common masticatory of the East, known all over India as *pan supari*. Statistically both the betelnut and the betel leaf are regarded as spices and the internal demand for the former is so great that the import trade is of much greater moment than the export, though there is some traffic outwards with colonies where Indian emigrants abound. Though supplies of betel leaf, which are derived from a climbing plant belonging to the same family as pepper, are drawn from considerable distances by rail and river, the fact that they have to be chewed green, limits foreign exports, which are negligible, to the island of Ceylon. The areca palm is confined almost entirely to the moist tropical tracts that fringe the coastline and it is seldom found more than 200 miles from the sea. No statistics of area or production are available, but the number of trees must be very large as the demand is practically universal. In Southern India a full-grown tree is calculated to yield 250 to 300 nuts annually, but elsewhere, as for example in Burma, the average output is very much lower. The nut is prepared in a great variety of ways for sale, being sometimes marketed sun-dried only, and sometimes plucked unripe and boiled and sliced. The Indian tariff recognises six different classes with different valuations for purposes of import duty.

The following table illustrates the insignificant extent of the export trade as compared with the import trade.

Exports.

TABLE NO. 199.—Exports and imports of betelnuts from 1913-14 onwards.

Year.	EXPORTS.		IMPORTS.	
	Quantity.	Value.	Quantity.	Value.
	Lbs.	£	Lbs.	£
1913-14	439,886	8,224	127,464,241	819,086
1914-15	482,160	10,111	140,298,125	868,306
1915-16	323,714	6,826	131,111,854	850,434
1916-17	393,574	8,413	128,277,848	870,787
1917-18	581,296	11,771	115,616,725	814,488
1918-19	362,419	8,119	142,527,083	1,141,269
1919-20	731,136	16,249	126,128,800	1,035,473
1920-21	401,632	9,010	107,034,928	973,631
1921-22	382,704	10,069	110,173,056	912,088
1922-23	397,712	11,140	124,216,624	1,083,894

The principal recipients of Indian betelnuts are Aden, Natal, Mauritius, Kenya Colony, and Fiji, and the chief ports of export Bombay and Madras; Negapatam and Tuticorin having lost the share of the trade they enjoyed before the war. The bulk of the imports come from Ceylon, the Straits Settlements, Java and China.

The unit of sale in Calcutta is the bazaar maund and the nuts are shipped in bags weighing 2 maunds. In Bombay the unit of sale is the candy of 21 Bombay maunds or the maund of 28 lbs., shipment being made in bags of 140 to 182 lbs.

### Cinnamon.

The true cinnamon of commerce is the dried bark of *cinnamomum zeylanicum*, a native of Ceylon but found also on the Western Ghats in Southern India at altitudes up to 6,000 feet.

#### Marketing.

The plant exists under cultivation as a coppiced bush. The bark after removal is pressed in bundles until slight fermentation sets in, which allows of the scraping of the outer covering and the pulp underneath. These strips are then cut into lengths of about twelve inches and dried, when they contract into the shape of *quills* under which name they are sold. Thicker pieces of bark from the larger shoots are sold as *chips* which command lower prices as the flavour is inferior. Three valuable essential oils are also obtained from the tree, one from the bark, one from the leaves, known as *clove oil*, and one from the root, all with medicinal properties. No statistics of area or production of cinnamon are maintained but the yield per acre is said to be 150 lbs.

The provinces contributing to the insignificant export trade are Madras and Bengal the chief port in the former presidency being Tellichery on the West Coast. The true cinnamon is very

#### Exports.

commonly adulterated, specially in powder form, with *cassia lignea* the bark of *cassia cinnamomum* common in East Bengal, the Khasia Hills and Burma, and the exports from Bengal would most probably seem to be of this origin. The following table shews remarkably little variation between the volume of exports in 1913-14 and 1922-23 but a marked fall in price. The principal destinations of the exports are the United Kingdom, Persia, Mauritius, and Egypt.

TABLE No. 200.—Quantity and value of exports of cinnamon from India from 1913-14 onwards.

Year.	Quantity.	Value.
	Lbs.	£
1913-14 . . . . .	33,170	1,015
1914-15 . . . . .	39,711	869
1915-16 . . . . .	54,147	1,144
1916-17 . . . . .	66,045	1,356
1917-18 . . . . .	55,554	1,064
1918-19 . . . . .	71,979	2,329
1919-20 . . . . .	31,584	866
1920-21 . . . . .	20,048	864
1921-22 . . . . .	10,752	220
1922-23 . . . . .	33,264	653

The unit of sale in Calcutta is the bazaar maund and shipment is made in bags of 2 maunds. On the West Coast sales are on the basis of the candy of 600 lbs. or the maund weighing 28 lbs., while exports are made in bags of 100 or 168 lbs.

## Cloves.

Cloves are the dried, unexpanded flower buds of *eugenia caryophyllata* plucked when they assume a bright pink or scarlet colour and generally dried in the sun with or without scalding, the yield from each tree being about 6 or 7 lbs. of dry cloves. There is no systematic cultivation in India and no statistics of acreage or yield are separately recorded. Cloves are chiefly grown in the foothills of the Western Ghats in the Madras Presidency. A valuable essential oil is obtained from the dry buds which is largely employed in perfumery.

Zanzibar and Pemba contribute four-fifths of the world's supply of cloves and India on an average imports 9,000,000 lbs. valued at £210,000 from these two countries. Exports

**Exports.** from India on the other hand are small and in value seldom exceed £600. In 1913-14 the total quantity shipped reached barely 10,000 lbs. The total rose to 21,000 lbs. in 1915-16 while in 1917-18 and the following year 19,000 lbs. went out from Calcutta, probably on account of freight being more readily obtainable there than in Madras which used to enjoy a monopoly of this trade. The figure for 1922-23 was 8,000 lbs. The chief post war destinations are the Straits Settlements, Mauritius, and Fiji.

The unit of sale in Calcutta is the seer and shipment is made in bundles weighing 2 bazaar maunds.

## COIR.

Of the products derivable from the coconut, the exports from India of coir fibre and manufactures thereof were at the outbreak of war, second in importance to those of copra, and of considerably greater value than the shipment of coconut oil. The coir industry then underwent severe eclipse, but the premier position temporarily usurped, while war lasted, by coconut oil is now claimed by coir manufactures.

In normal times the manufacture of coir is a flourishing cottage industry on the Malabar Coast, most of the workers being women. The coconut husks should be buried for at least

**Coir fibre.** eight months in pits on the foreshore of rivers or backwaters, where there is a good scour and then removed and beaten on stones till the pith and all extraneous particles are removed. The better qualities of fibre are yielded by this method. The varieties of coir known in the trade as *unsoaked*, which are generally inferior, are obtained by treating the husks immediately after the nuts have been extracted or alternatively, storing the whole nuts in a dry place for six or seven months and after the kernels have been extracted, immersing the husks in water for twelve hours or so before beating. Five or six nuts should yield one lb. of dried clean fibre.

Shipments of coir fibre are inconsiderable but such as there are go forward usually in hydraulic pressed bales containing 200 lbs. nett,

**Exports of fibre.** gunny-covered and hoop-bound, the unit of sale being the candy of 600 lbs. The table below shows the quantities and values of coir fibre exported from 1913-14 onwards.

TABLE No. 201.—Quantities and values of coir fibre exported from 1913-14 onwards.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	746	11,450
1914-15 . . . . .	246	3,491
1915-16 . . . . .	333	4,509
1916-17 . . . . .	248	3,295
1917-18 . . . . .	153	1,982
1918-19 . . . . .	300	4,353
1919-20 . . . . .	354	5,677
1920-21 . . . . .	410	6,557
1921-22 . . . . .	424	6,893
1922-23 . . . . .	490	7,854

Cochin has a monopoly of the comparatively small exports of this fibre from India in the raw state.

It is more usual to export the fibre in the form of yarn rope. In the former case it is spun to the required length either by hand as is the case in Malabar, or on the spinning wheel as in

**Coir yarn.** Travancore. The husks of nuts about ten months old yield better material than older or immature nuts. And tidal backwaters furnish the best soaking pits. The best yarns *Alepat*, *Anjengo*, and *Ashlamudy* named after the localities where they are produced or collected are easily distinguishable by their colour and twist.

Between the spinner and the shipper the yarn passes through many hands. The first middleman may be a petty shopkeeper who has accepted yarn in payment for rice or salt, or

**Trade organisation.** the owner of a shed in which half a dozen or more piece-workers wash and spin the fibre from his coir pits. Eventually the yarn, which is all in short hanks, reaches dealers who sort it roughly according to colour and thickness and put it up in bundles weighing a standard maund or multiples thereof, before disposing of it to the big dealers at the coast ports from whom the shippers get their supplies, or to the manufacturers. The shipper is obliged, when the yarn has been examined and graded by women according to size and colour, to get it rewinded into long hanks of 450 yards weighing 2½ lbs. each at a cost of about Rs. 10 per ton because the village workers cannot be persuaded to do so. These hanks are then tied across and made into bundles each weighing one cwt., which again are baled and hydraulically pressed before shipment. Inferior yarns are done up in bundles known as *dholls* of 5 or 7 lbs. for acceptance as broken stowage. The principal ports of shipment are Cochin and Calicut.

The exports of manufactured coir exclude rope (which is separately classified in the trade returns) and consist chiefly of **Exports of manufactured coir.** yarn. The following table shews the quantity and value exported since 1913-14.

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1919-20 . . . . .	354	5,677
1920-21 . . . . .	410	6,557
1921-22 . . . . .	424	6,863
1922-23 . . . . .	490	7,854

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The exports of manufactured coir exclude rope (which is separately classified in the trade returns) and consist chiefly of **Exports of manufactured coir** yarn. The following table shews the quantity and value exported since 1913-14.

TABLE NO. 202.—Quantity and value of manufactured coir, excluding rope, exported since 1913-14.

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	38,610	592,741
1914-15 . . . . .	23,790	380,299
1915-16 . . . . .	27,140	426,824
1916-17 . . . . .	28,480	436,360
1917-18 . . . . .	19,930	307,365
1918-19 . . . . .	13,165	233,346
1919-20 . . . . .	38,297	687,228
1920-21 . . . . .	30,041	658,727
1921-22 . . . . .	27,742	610,475
1922-23 . . . . .	33,116	728,450

In addition, there were shipments averaging about 1,600 tons of yarn annually from the Travancore port of Alleppey.

Before the outbreak of war Germany took rather more and the United Kingdom rather less than 30 per cent of the whole, the balance going in about equal shares to Holland, Belgium and France. In 1917-18 and 1918-19 tonnage was scarce and the exports were restricted chiefly to matting. During the post-war period (1919-20 to 1922-23) the average quantity exported amounted to 32,000 tons, of which 14,500 tons, or 45 per cent, were taken by the United Kingdom, the bulk of the balance going to Germany, Netherlands, Belgium, France, Italy, and the United States of America.

The West Coast ports are practically closed to traffic during the south-west monsoon, and the season for shipment therefore runs from September to May. The yarn is shipped from Cochin and Calicut in hydraulic pressed bales weighing 3 cwts. apiece, and from Cocanada in bales weighing 280 lbs. nett. The unit of sale in Cochin is the candy of 600 lbs., in Calicut the cwt., and in Cocanada the candy of 500 lbs.

Of the ports participating in the trade, Cochin, it will be seen, continues to enjoy a preponderating share. The pre-war percentage of Cochin was 76 and of Calicut 21.

TABLE NO. 203.—Quantity and percentage share of the principal ports in the exports of manufactured coir (excluding rope) in 1922-23.

Ports.	Exports.	Percentage.
	Tons.	
Madras Presidency—		
Cochin . . . . .	25,341	78
Calicut . . . . .	6,429	19
Cocanada . . . . .	226	1
Tuticorin . . . . .	5	-02
Bombay Presidency—		
Bombay . . . . .	193	6

The signs of quality are colour, which should be golden, strength, length and lightness. On the Malabar Coast about a dozen different grades are recognised, which may be placed roughly as follows in order of merit.

Alapat . . . . .	Fine hand-twisted.
Anjengo . . . . .	} All wheel-twisted.
Aratory . . . . .	
Ashtamudy . . . . .	
Kuruva or Curwa . . . . .	
Vycome . . . . .	} Weaving yarns, hand-twisted.
Beach . . . . .	
Calicut (fine unsoaked) . . . . .	
Beypore . . . . .	
Quilandi . . . . .	
Cochin . . . . .	Roping yarn.

All the above yarns are two-ply and so is the loosely twisted yarn of inferior quality shipped from Cocanada to the extent of about 400 tons annually. *Alapat* coir is probably the finest in the world and has always commanded a higher price than any other variety on the European market. There is also *Divi* coir which is brought over to the mainland to the extent of four to five thousand cwts. annually by the Laccadive and Amindivi islanders and taken over by Government at privileged rates in lieu of tribute. This coir is thereafter sold by auction at Mangalore, and though it varies very much in quality, the best is only inferior to *Alapat* and *Anjengo*. The importance of the industry on the Malabar littoral is illustrated by the table subjoined which gives details of the shipments coastwise to other parts of India as well as the foreign exports.

TABLE No. 204.—Quantities and values of manufactured coir (excluding rope) exported (foreign and coastwise) in 1913-14 and from 1918-19 onwards from the Madras Presidency.

Year.	FOREIGN.		INDIAN PORTS.		TOTAL.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£	Tons.	£
1913-14 . . . . .	38,300	587,000	9,450	103,000	47,750	690,000
1918-19 . . . . .	13,090	232,000	13,300	139,000	26,390	371,000
1919-20 . . . . .	36,578	650,000	9,817	119,000	46,395	769,000
1920-21 . . . . .	29,462	644,000	11,970	171,000	41,432	815,000
1921-22 . . . . .	27,208	601,000	13,820	190,000	41,028	791,000
1922-23 . . . . .	32,575	716,000	12,493	162,000	45,068	878,000

Mats and matting of every description are woven from coir yarn on handlooms at Alleppey and Cochin for which there is normally a good demand from all parts of India. The export trade expanded very considerably during

the war with increased shipments from Cochin, but has since somewhat declined.

Quantities of coir rope and cordage (all hand-made) are also produced, but apart from coastwise traffic chiefly to Bombay whose trade amounted in 1917-18 to £36,000 in value, the Coir rope and cordage trade is insignificant since coir rope cannot compete with Manilla in most foreign markets.

TABLE NO. 205.—Exports of coir rope and cordage\* in 1913-14 and from 1918-19 onwards (quantities and values).

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	3,021	70,180
1918-19 . . . . .	2,717	78,448
1919-20 . . . . .	3,114	87,851
1920-21 . . . . .	2,724	90,555
1921-22 . . . . .	2,595	87,712
1922-23 . . . . .	2,511	79,587

\* Including small quantities of rope and cordage manufactured from other vegetable fibre.

Coir rope is made up into lengths of 60 or 120 fathoms and sized by circumference. The unit of sale in Calicut is the cwt. and in Cochin the candy of 600 lbs., while shipment is made from the former port in coils of 1 to 2 cwts. and from the latter in bales of 3 cwts.

In the last two years of the war about 150,000 sq. yards of coir screening (similar to Kentish hop screening) were supplied monthly to the military authorities in France for *camouflage* purposes. Other manufactures of coir include mesh bags which are very useful for the carriage of tanning bark and other produce from one part of India to another.

## RUBBER.

Though a number of rubber yielding trees are indigenous to Indian forests they are not sufficiently abundant to justify exploitation, and,

History of cultivation. apart from two plantations in Assam under *ficus elastica*, the spasmodic efforts made to grow rubber on a commercial scale never got beyond the experimental stage before 1900. There are two tracts enjoying very similar climate and rainfall scarcely less favourable than Malaya which pre-eminently offer potentialities for rubber growing in India, *viz.*, the Tenasserim coast in Burma and the Malabar coast below the Western Ghats from Mangalore to Cape Comorin. The more southerly districts have a more evenly distributed rainfall, closely approximating to that of Ceylon. In cultivation and transport facilities Southern India enjoys considerable advantages over Burma where communications are very backward and labour, other than imported, not easy to obtain. In Travancore the Shencottah and Mundakayam districts and the Rani valley are the chief centres of the industry, the pioneer estate at Thattakad on the Periyar River being opened up in 1902 with *Para* rubber (*hevea brasiliensis*) which has generally proved far the most

suitable variety for cultivation in Southern India. In the last seventeen years there has been a great deal of exploitation, particularly in Travancore, but also to some extent in Cochin, Malabar, Coorg and the slopes of the Shevaroy Hills in the Salem district, while the Burma Government plantation at Mergdi, having demonstrated that *Para* rubber could be successfully grown in Burma, was about 1910 sold to a limited company, and other areas have since opened up there and in the neighbourhood of Rangoon.

The area under rubber in India in 1922 was estimated as in the neighbourhood of 128,000 acres, the provincial distribution of which is shewn in the following table.

TABLE NO. 206.—*Provincial distribution of the area under rubber in India in 1922.*

Provinces.	Acreage.
Burma . . . . .	60,870
Travancore . . . . .	41,337
Madras Presidency . . . . .	9,930
Malabar . . . . .	8,533
Salem . . . . .	654
Nilgiris . . . . .	743
Cochin . . . . .	8,839
Assam . . . . .	3,064
Mysore . . . . .	993
Coorg . . . . .	2,425
TOTAL . . . . .	127,458

The above figures include land cleared but not fully planted up and the total area tapped was 62,000 acres only, as compared with 220,000 acres in Ceylon, 500,000 in Malaya, 400,000 in the Dutch East Indies and 40,000 in the ex-German colonies. In Burma 22,000 acres were tapped in 1922, giving an yield of over 4½ million lbs. of rubber. Of the area in Travancore, all under *Para* rubber, large estates account for 26,000 acres and the balance is made up of plots, chiefly small, under cultivation by Indians. About 23,300 acres were tapped and the outturn at the rate of 208 lbs. per acre in 1922 has been put at about 5 million lbs. Of the 8,839 acres, also all under *hevea*, actually planted in Cochin, 7,029 acres were tapped. The acreage in Assam, which consists of plantations at Charduar and Kulsi, containing a number of *ficus elastica*, is worked by Government agency. No area was tapped during the year 1922. The total acreage in Coorg

under *hevea* was 2,425, of which 1,712 acres were tapped. In 1916 new rules governing the grant of lands for rubber planting in Burma were promulgated, which, as anticipated, have encouraged further extensions of the industry, the area under rubber having increased from 48,727 acres in 1919 to 60,870 acres in 1922 chiefly in the Mergui, Thaton, and Hanthawaddy districts. But of this total less than one-third was tapped. A royalty is levied on rubber exported from Burma at the rate of 2 per cent on the net value which is calculated each month on the average value in the London market for the previous month with such deductions as may be prescribed by the Government of Burma on account of the cost of production, freight and sale charges.

The growth in the exports from India up to 1919-20 was remarkable. In 1913-14 these aggregated 2,605,000 lbs. only, of which 1,787,000 lbs.

were contributed by the Madras Presidency, the bulk of the shipments going from Cochin and Tuticorin. In 1918-19 the corresponding figures were 13,907,000 and 9,726,000 lbs. Since then there has been a set-back, owing to the slump in rubber prices which continued until October 1922. Cultivation expenses were cut down to a minimum and the cost of production materially reduced and the modest enhancement which has since been recorded in values if maintained, will leave most plantations with a small margin of profit. The partial curtailment of output which has been enforced in Ceylon and Malaya should contribute to perpetuate this improvement. Shipments from 1919-20 are indicated in the following table.

TABLE NO. 207.—Exports of rubber, raw, from India and the share of the principal ports from 1919-20.

Ports.	1919-20.		1920-21.		1921-22.		1922-23.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Lbs.	£	Lbs.	£	Lbs.	£	Lbs.	£
Cochin . .	4,538,253	469,345	5,991,285	428,097	4,943,155	212,689	4,656,745	173,847
Tuticorin . .	1,900,142	211,708	1,934,809	209,858	1,328,225	112,241	1,001,726	26,594
Calicut . .	1,051,741	115,918	1,558,684	130,046	411,931	22,569	1,321,474	65,207
Mergui . .	2,274,908	150,648	1,817,570	104,740	1,913,837	68,907	2,360,862	85,734
Bangoon . .	2,274,046	138,031	2,042,014	122,868	1,924,188	81,299	2,434,507	118,192
Madras . .	25,800	3,362	58,069	4,984	9,569	337	..	..
Calcutta . .	3,472	475	6,496	371	..	..	..	..
TOTAL (including other ports) .	12,599,083	1,125,104	14,014,072	1,034,255	11,014,534	514,405	12,499,174	483,340

Seven-tenths of the whole go from the Madras Presidency and the balance from Burma, the Calcutta trade in Assam 'wild' rubber being negligible. The Burma trade is generally divided between

Rangoon and Mergui in almost equal shares, though the proportion varies in certain years with larger shipments from Tavoy and Victoria Point. Shipments of rubber are either in the form of crêpe or sheetings. The shares of the principal recipients in 1913-14 and in 1922-23 are contrasted below. A striking commentary on the fall in rubber prices during the decade is afforded by the fact that though the volume of exports has increased five-fold since 1913-14, the aggregate value is 10 per cent lower.

TABLE NO. 208.—Share of the principal recipients of rubber, raw, exported from India in 1913-14 and 1922-23.

Destinations.	1913-14.		1922-23.	
	Quantity.	Value.	Quantity.	Value.
	Lbs.	£	Lbs.	£
United Kingdom . . . . .	1,718,752	336,113	6,584,583	265,329
Ceylon . . . . .	784,112	171,864	3,015,838	112,168
Straits Settlements (including Labman). . . . .	75,264	11,891	1,437,318	53,480
France . . . . .	..	..	38,300	1,100
Holland . . . . .	22,400	4,169	15,770	591
United States of America . . . . .	3,686	519	1,074,861	38,627
Germany . . . . .	1,232	120	275,280	11,817
TOTAL (including other countries)	2,605,568	524,486	12,409,174	483,340

Shipments in 1920-21 amounted to 14 million and in 1921-22 to 11 million lbs. Colombo continues to be an important entrepôt for rubber grown in Southern India while Singapore is a similar entrepôt for Mergui rubber. These two recipients with the United Kingdom appropriate the greater part of the outturn. In 1922-23 the United Kingdom took 53 per cent of the total, Ceylon 24 per cent, the Straits Settlements 12 per cent, and the United States of America 9 per cent. The average declared value was only 9 annas 3 pies (9½d.) per lb., as compared with 11 annas 2 pies (11½d.) in the previous year, in spite of a marked improvement in rates from November 1922.

The unit of sale is the lb. From Burma shipment is made in cases, varying in weight from 175 lbs. nett for high class quality to 200 lbs. for inferior grades. The unit of shipment in Madras and in Cochin is the chest weighing 100 or 200 lbs. Quotations for export are generally based on the lb. *c.i.f.*

#### COAL.

The bulk of the Indian coalfields belong geologically to the Gondwana system from which is obtained 97½ per cent of the coal won. The Raniganj and Jharia are the two principal coalfields and from them are derived 83 per cent of the

#### Occurrence.

total output. The former lies chiefly in the Burdwan district of Bengal and the first working dates from 1820, while mining on the Jharia field, which is in the adjoining province of Bihar, began in 1893. Outside these two provinces the most important mine is that at Singareni near Yellandlapad in the Hyderabad State, which was first worked in 1887; the average annual production during the ten years ending 1922 being 626,000 tons, and the output in 1922 over 600,000 tons. Other fields of importance are those in the Wardha and Pench valleys in the Central Provinces and the Umaria mine in Rewah State, and of tertiary deposits those at Makum in Assam and in the Jhelum district (Punjab) are the most considerable.

The value of the coal produced in India is reported annually by mine-owners and represents the actual or estimated wholesale price of coal at the pit's mouth. The qualities of coal commonly sold on the Calcutta market are

*Desherghur* (from the seam of that name which runs through the Raniganj field) and *selected Jharia*. In the following table the average value of all the coal produced is contrasted with that of the declared export value at the ports of shipment.

TABLE NO. 209.—Average value of coal at the pit's mouth contrasted with that declared at time of export.

Year.	Value at the pit's mouth per ton.	Declared export value per ton.
	Rs. As. P.	Rs. As. P.
1913	3 8 0	9 13 0
1914	3 9 0	8 13 0
1915	3 5 0	9 3 0
1916	3 6 0	9 2 0
1917	3 11 0	9 5 0
1918	4 6 0	10 9 0
1919	4 8 0	11 14 0
1920	5 3 0	12 13 0
1921	6 12 0	13 15 0
1922	7 11 0	13 8 0

The total production in 1922 amounted to 19,011,000 tons, exclusive of the more or less empirical estimate of 400,000 tons taken by the miners for their own use. The production and consumption of Indian coal steadily increased from 1906, but since 1920 there has been a decided set-back which is attributed to labour troubles and transport difficulties.

The output of coal in each of the principal coal-bearing provinces and Indian States is shewn in the table overleaf.

TABLE NO. 210.—*Production of coal in each Province and State of India.*

Year.	BRITISH PROVINCES.							INDIAN STATES.			General Total.
	Assam.	Bihar and Orissa.	Bengal.	Punjab.	Baluchistan.	Central Provinces.	Total British India (all provinces).	Hyderabad.	Rajputana (Bikaner).	Central India (Rawah).	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1901-05 (Average)	259,000		6,481,000	55,000	39,000	167,000	7,001,000	423,000	28,000	176,000	7,627,000
1906-10 (Average)	292,000	6,796,000	3,626,000	56,000	47,000	180,000	10,800,000	466,000	31,000	161,000	11,628,000
1911	294,898	7,610,330	3,858,574	30,575	46,707	211,616	12,051,836	506,980	14,761	143,558	12,715,534
1912	297,160	9,126,385	4,306,129	38,400	54,886	233,996	14,056,515	481,652	18,261	149,921	14,706,350
1913	270,862	10,227,557	4,640,985	51,040	62,932	235,651	16,468,117	562,133	18,781	148,978	16,808,000
1914	305,160	10,661,062	4,424,557	54,303	48,334	244,745	16,738,155	555,691	17,211	158,306	16,464,263
1915	311,296	10,718,155	4,976,460	67,911	43,607	263,118	16,956,632	586,824	17,796	189,660	17,108,932
1911-15 (Average)	296,000	9,069,000	4,448,000	46,000	49,000	236,000	14,739,000	537,000	17,000	147,000	16,440,000
1916	287,315	10,767,683	4,992,376	47,440	42,103	237,232	16,424,803	616,890	13,841	200,285	17,254,300
1917	301,480	11,032,419	4,631,571	49,860	40,785	371,468	17,327,637	630,020	6,045	106,407	18,215,018
1918	294,484	13,680,030	6,302,295	60,478	43,125	481,470	19,852,662	659,122	11,334	199,075	20,722,403
1919	201,734	15,119,812	5,777,632	46,898	84,323	467,021	21,768,940	662,196	14,760	182,141	22,628,037
1920	325,535	11,975,650	4,207,462	58,078	83,941	401,205	17,001,867	694,080	18,216	158,061	17,662,214
1916-20 (Average)	300,000	12,995,000	4,922,000	51,000	39,000	420,000	18,493,000	662,000	13,000	188,000	19,366,000
1921	312,465	12,090,481	4,256,642	67,242	54,627	712,614	18,367,671	688,721	24,521	192,034	19,329,947
1922	348,103	12,711,322	4,328,966	67,180	60,136	675,916	18,791,820	642,880	15,655	161,231	19,016,926

\*Included under Bengal.

The number of persons engaged in the coal mining industry in 1917 was 167,272; 62,324 above and 104,948 below ground, the corresponding figures for 1922 being 200,913; 83,171 above and 117,742 below ground. The classes from

**Labour.** which colliery labour is recruited being largely agricultural, supply is adversely affected by a favourable monsoon as the cultivator only turns to mining when his crop has failed and his savings are exhausted. The average annual output per head of labour employed below ground was 162 tons in 1921 as compared with 178 tons in the United Kingdom, but, as has been indicated above, the Indian miner is the product of necessity rather than of inclination. There has been a great advance in recent years in the systematic development of the mines, in a number of which there are now electrical installations for haulage, lighting, pumping and ventilation, and the practice of coal cutting by machinery is extending.

Almost all the coal shipped as private merchandise from India goes from Calcutta. Ceylon and the Straits Settlements used to be the principal foreign markets, the only other important customer being Sumatra, Sabang

**Exports.** being a convenient coaling station for steamers on the Far Eastern run. The total quantities exported from 1913-14 onwards are shown in the table below with the shares of the principal recipients. In January 1921, shipments to Singapore, Penang, Sabang, Aden, and Perim were totally stopped and Colombo was given reduced allotments which terminated in the month of March and strictly rationed thereafter. As a result of these restrictions more coal was made available for Indian industries which in spite of unprecedented arrivals of Welsh coal were at one period threatened with complete stoppage. The embargo was removed with effect from the 1st January, 1923. Exports did not, however, revive during the last quarter of the year and the total exports during 1922-23 decreased to 98,000 tons from 113,000 tons in 1921-22. Almost the whole quantity was sent to Ceylon. For the first eleven months of 1923-24 the total was 123,600 tons.

TABLE No. 211.—Exports of coal on private account according to destinations from 1913-14 onwards.

Year.	Ceylon.	Straits Settlements (including Labuan).	Dutch East India.	Others.	TOTAL.
	Tons.	Tons.	Tons.	Tons.	Tons.
1913-14 . . . . .	393,889	183,501	97,652	46,714	721,756
1914-15 . . . . .	332,610	100,636	72,810	26,436	592,492
1915-16 . . . . .	587,691	97,874	84,683	33,910	803,958
1916-17 . . . . .	532,443	144,116	106,809	45,774	829,142
1917-18 . . . . .	153,991	68,595	8,474	24,845	255,905
1918-19 . . . . .	81,310	45,763	8,771	7,783	143,627
1919-20 . . . . .	426,404	120,498	78,928	53,939	679,769
1920-21 . . . . .	674,005	194,381	67,855	206,367	1,142,608
1921-22 . . . . .	104,727	..	..	8,643	113,370
1922-23 . . . . .	97,111	..	..	513	97,624

No very considerable increase in the volume of foreign exports can be anticipated while the present price levels for Indian coal are maintained. In fact with the assistance of low freights, Cardiff and Natal coal are competing successfully in the Bombay market with Jharra and Raniganj.

The figures of bunker coal and coal on Admiralty and Royal Indian Marine shipping account are not included in the statistics of foreign exports. The total shipments of bunker coal in 1922 amounted to 796,000 tons; 575,000 tons from Calcutta, 102,000 tons from Bombay and Karachi, 99,000 tons from Rangoon and 20,000 tons from Madras.

Coke is now produced in India mainly in the area covered by the Bihar and Orissa coal fields from low-grade coal, but only small quantities are exported. In 1922 the production of coke amounted to 322,500 tons as compared with 272,500 tons in 1921. The exports during 1921-22 and 1922-23 were 1,362 tons and 568 tons respectively, Ceylon, the Straits Settlements and Mesopotamia taking the bulk. There have hitherto been no recorded exports of patent fuel.

The imports of foreign coal into India amounted in 1913-14 to 531,814 tons, of which 155,390 tons were from the United Kingdom and the balance chiefly from Natal, Portuguese East Africa, Japan, Holland and Australia. During the war these imports declined from 379,000 tons in 1914-15, to 115,000 tons in 1915-16 and 48,000 tons in 1916-17. In 1917-18 there was a further drop to 23,600 tons, but there was a revival in the following year to 67,600 tons. In 1919-20 the imports again fell to 38,000 tons, but rose in the three succeeding years to 86,000 tons in 1920-21, 1,489,000 tons in 1921-22, and 882,000 tons in 1922-23. To this last total the United Kingdom contributed 497,000 and Natal 254,000 tons, of which Bombay received 70 and Karachi 10 per cent, respectively. The imposition of a countervailing duty equivalent to the rebate allowed by the South African Government on Natal shipments has recently been advocated in a resolution passed by the Imperial Legislative Assembly at Delhi.

The total available supply of coal (Indian and foreign) arrived at by adding imports (*minus* re-exports) to the total production and deducting exports therefrom amounted in 1922 to 20,082,000 tons, as compared with 20,702,000 tons in 1917 and 20,116,000 tons in 1921. The statement below gives the Director General of Commercial Intelligence's estimate of the distribution of this supply among railways and industrial concerns and the percentage under each head to the whole. Of the 6½ million tons consumed by Indian railways, nearly 5½ million tons, or 88·5 per cent, were Indian coal.

TABLE NO. 212.—*Estimated consumption of coal in 1922.*

Consumers.	Quantity (tons).	Percentage.
Railways . . . . .	6,186,000 <sup>(a)</sup>	30.8
Admiralty and Royal Indian Marine Shipping Accounts	40,000	.2
Bunker Coal . . . . .	796,000	4.0
Cotton Mills . . . . .	1,131,000	5.6
Jute Mills . . . . .	942,000	4.7
Iron, Steel and brass foundries (including engineering Workshops).	2,415,000	12.0
Port Trusts . . . . .	210,000	1.1
Inland steamers . . . . .	582,000	2.9
Brick and tile factories (including potteries and cement works).	437,000	2.2
Tea gardens . . . . .	204,000	1.0
Paper Mills . . . . .	147,000	.7
Consumption at Collieries and wastage . . . . .	2,471,000	12.3
Other forms of industrial and domestic consumption	4,521,000	22.5
TOTAL	20,082,000	100

(a) For the official year 1922-23.

The distribution of coal throughout India became a matter of acute difficulty in 1917 on account of the special conditions set up by the war.

**Government control of coal.**

Before the war the bulk of the coal consumed on the western side of India was carried by sea from Calcutta and the railways serving the coalfields of Bengal and Bihar and Orissa were laid out and equipped for transporting some 3 million tons of coal per year to the Calcutta docks for shipment. When shipping failed, all this coal, with the exception of a very small percentage sent by sea on Admiralty account, had to be transported by rail across India.

In the first instance a Coal Committee was appointed to deal with the situation which introduced a system of distribution by priority, but as the work in connection with the distribution of coal to industrial concerns in India, in addition to meeting demands on Admiralty and military account, became heavier and more complicated, the Government of India decided in November 1917 to vest all powers in a single officer designated Coal Controller.

The main difficulty with which the Coal Controller was faced at the outset was a shortage of labour in the coalfields. He therefore imposed restrictions on the output of a large number of collieries producing the inferior classes of coal in order to prevent labour being diverted from collieries producing better class of coal. Some collieries were restricted as to the monthly tonnage which they might raise and

despatch while others were only allowed to manufacture soft coke for domestic purposes.

To save railway wagons for the movement of grain and fodder about India, the Coal Controller also prohibited the transport of brick-burning coal and dust except for purposes of very special importance, and throughout the year 1918 public lighting in the streets of Calcutta and Bombay was reduced to a minimum.

A certain quantity of coal was originally requisitioned on Government account at the end of 1916, but the whole output of all collieries

working first class coal was requisitioned in June 1917 and, owing to a shortage, the output of a certain number of collieries working second class coal was temporarily placed under requisition early in 1918.

During 1918 the bunkering of steamers in Bombay, Karachi and Calcutta was also controlled by Government.

Control began to be relaxed early in 1919, and in April of that year was abolished, when the onerous responsibilities of the Coal Controller in connection with the transportation of coal by rail were transferred to an officer under the Railway Board.

#### PARAFFIN WAX.

The trade in paraffin wax, which is one of the most valuable of the refinery products of petroleum, has developed greatly during the last decade with the expansion of the Burma oil industry, and the foreign demand has always absorbed a great deal of the output. In 1912-13 the volume of exports exceeded 260,000 cwts. valued at £400,000 and ten years later the corresponding totals were 547,000 cwts valued at £322,000.

TABLE No. 213.—Exports of paraffin wax (quantities and values) to all destinations from 1913-14 onwards.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	303,153	448,736
1914-15 . . . . .	373,010	548,135
1915-16 . . . . .	373,589	542,477
1916-17 . . . . .	454,867	677,956
1917-18 . . . . .	494,250	739,901
1918-19 . . . . .	496,476	745,652
1919-20 . . . . .	528,980	790,091
1920-21 . . . . .	499,600	744,044
1921-22 . . . . .	562,820	851,859
1922-23 . . . . .	547,380	822,402

In 1914-15 Japan was the next best customer after the United Kingdom, while the United States and China each doubled the total of the previous year. In 1915-16 owing to the demand for paraffin wax for munition purposes, the volume of exports from Burma, in spite of restrictions and freight shortage, was about the same. The United Kingdom took 124,000 and Japan 63,000 cwts., as compared

with the absorption in the coastwise trade of 13,000 cwts. only. In 1916-17 there was some relaxation of the embargo and a very largely increased demand for the wax, especially from Japan, to which country over 100,000 cwts. were shipped, and with these factors persisting, there was a slight appreciation in the aggregate and in the volume of exports to Japan in 1917-18. In 1918-19, on the other hand, scarcity of tonnage to Japan reduced exports to that country to 39,000 cwts., but there were increased exports to the United Kingdom, South Africa and Portuguese East Africa. The figures for the past four years have shown little variation. Japan has taken the place of the United Kingdom as principal customer. The consumption in India continues comparatively insignificant.

TABLE No. 214.—*Distribution of the trade in paraffin wax among principal recipients in 1922-23.*

Countries.	Quantity.	Value.
	Cwts.	£
Japan . . . . .	152,680	231,557
United Kingdom . . . . .	69,620	105,792
Australia . . . . .	31,740	41,312
Cape Colony and Natal . . . . .	39,530	60,069
Hongkong . . . . .	22,940	33,035
Belgium . . . . .	17,300	26,238
China . . . . .	94,340	143,092
United States of America . . . . .	29,000	43,983
Italy . . . . .	26,200	39,737
Other countries . . . . .	64,080	97,596
TOTAL	547,380	822,402

About 95 per cent of the exports go from Rangoon and the balance from Calcutta.

The unit of sale in Calcutta is the bazaar maund and shipment is made in packages of 168 lbs. Sales are made in Rangoon on the basis of the lb. and the wax is shipped in bags weighing 140 lbs. nett. Quotations for export are generally made per cwt c. i. f.

#### PROVISIONS AND OILMANSTORES.

Of the articles exported from India which fall under this heading the only items of importance are butter and *ghi*, the value of which ordinarily makes up three-fourths of the total.

##### Butter.

Indian butter is generally made either from curdled boiled milk (*dahi*) or from milk that has been only scalded. Climatic considerations practically prevent preparation from the cream of fresh milk as in Europe but, with the development of dairy farming in Western India, cream separators have been introduced in many large towns, and the resultant butter is tinned for internal distribution as well as for the export trade. The centres of this industry are Bombay and Aligarh. Twenty years ago over a quarter of a million lbs. of butter were imported annually. The figures for the last pre-war year were 374,000 lbs., valued at £28,500 and for 1922-23, 478,912 lbs., valued at £37,067. Large quantities of butter obtained from *dahi* are however

exported. Buffalo milk is richer in butter than that from the Indian cow. Butter is used by all classes and castes, and the bulk of the supply is home made. No estimate is possible of the proportion of such butter to the total exports.

The export traffic, which was very brisk in 1916-17 and the following year, has since declined and is now considerably below pre-war levels in volume, if not in value.

TABLE No. 215.—Quantity and value of exports of butter from India from 1913-14.

Year.	Quantity.	Value.
	Lbs.	£
1913-14	702,318	38,986
1914-15	551,284	29,660
1915-16	818,311	45,098
1916-17	1,472,471	82,025
1917-18	1,522,880	95,624
1918-19	690,142	48,584
1919-20	528,416	40,281
1920-21	348,320	30,588
1921-22	546,784	44,804
1922-23	478,912	37,067

Practically the whole quantity is shipped from Bombay, though in considerable quantities go also from Karachi. The principal destinations are Ceylon, Straits Settlements, Zanzibar and East Africa and the Persian Gulf, and in the latter years of the war increasing shipments were diverted to the United Kingdom. In 1917-18, 462,240 lbs. went to this destination.

Dairy butter is usually put up in tins of from one to five lbs. and sold by the lb. Country butter is shipped in wooden cases containing two new tins with a capacity of 18 lbs. each, and sold by the cwt.

The internal consumption of *ghi* in India greatly exceeds that of butter. *Ghi*, which is known as *neyi* in Southern India, is clarified butter prepared by practically every household by heating butter over a slow fire until an oil is formed that rises to the surface while the residue (mostly casein) settles down as sediment. This oil is then decanted and has the great advantage over butter that it will keep almost indefinitely. Butter loses about 25 per cent in the process of clarification. The chief producing areas are the United Provinces, Bengal, Rajputana, Central India and the Punjab. *Ghi* is used for all purposes to which butter is put in Europe and is also extensively employed in the preparation of bazaar sweetmeats. Adulteration is largely practised with the aid of vegetable oils like that of coconut, groundnut, nigerseed, poppy and sesame and also with animal fats and starch. The bulk of the quantity produced is locally consumed and supplies are reinforced by a considerable transfrontier trade, as well as by imports by sea from Persia and the Persian Gulf.

Though the figures for 1922-23 are disappointing, the export trade is normally remarkably steady and of considerable importance as the following table indicates, though the figures include 'imitation ghi' which contains about 15 per cent of pure ghi only and costs less than half the unadulterated article.

TABLE No. 216.—Quantity and value of exports of ghi from India.

Year.	Quantity.	Value.
	Lbs.	£
1913-14 . . . . .	5,568,809	232,947
1914-15 . . . . .	4,939,669	193,831
1915-16 . . . . .	5,290,992	205,142
1916-17 . . . . .	5,403,014	221,386
1917-18 . . . . .	5,513,200	252,290
1918-19 . . . . .	4,389,352	235,666
1919-20 . . . . .	3,864,896	247,138
1920-21 . . . . .	5,914,272	335,711
1921-22 . . . . .	5,383,168	306,800
1922-23 . . . . .	3,846,192	243,668

The trade is not centred in any particular port, though Calcutta accounts for about 60 per cent of the traffic, followed by Bombay, Negapatam, Dhanushkodi, Cocanada, and Madras in that order. Over nine-tenths of the exports go to British Possessions, particularly to those colonies with a large Indian immigrant population, such as the Straits Settlements, Ceylon, Mauritius, Fiji, Natal and East Africa.

The local unit of sale is the bazaar maund, quotations for export being generally made per case containing two new tins weighing 38 seers, either *c.i.f.* or *f.o.b.* This case of two tins is also the common unit of shipment.

### TOBACCO.

The tobacco plant is believed to have been introduced into India by the Portuguese at the beginning of the seventeenth century. The only two species cultivated in India are *nicotiana tabacum* in the Peninsula and the yellow-flowered *nicotiana rustica* in Northern India. In Lower Burma and Arakan there is a considerable quantity of tobacco grown from imported Havana seed, and Government, since the days of the East India Company, has made repeated efforts to improve the indigenous methods of curing and manufacturing and to produce a better quality of leaf. The tobacco industry is now identified with three principal centres—

- (1) Eastern and Northern Bengal and Bihar with headquarters at Rangpur and Monghyr;
- (2) Southern India, particularly the districts of Coimbatore, Salem, Trichinopoly, Madura, Kistna, Godavari and Guntur with Madras, Trichinopoly, Dindigul, Palghat and Cocanada as the chief manufacturing and trading centres; and
- (3) Lower Burma with Rangoon, Moulmein and Akyab as the principal centres.

The crop is suited only to small holdings as it requires considerable attention and liberal manuring. The area under tobacco in British India exceeds 1,000,000 acres and the outturn varies according to the attention given to the crop, from 200 to as much as 3,000 lbs. of cured leaf per acre. Though harvesting goes on in some localities as late as June, the bulk of the crop is gathered between February and April. The leaves are dried, sorted and then stacked and allowed to ferment, different qualities of tobacco being produced by varying the degree of fermentation allowed.

The best quality of Indian tobacco on the Calcutta market is known as *Rangpur* after the district of that name in which it is chiefly grown.

**Trade varieties.**

*Poolah* and *bispath* are varieties of Rangpur tobacco, the latter being of inferior quality. Other trade varieties known to exporters are *golden leaf* from Guntur for cigarette making and *thindoor* and *sindine* from Burma for cheroot wrappers and fillers.

The bulk of the tobacco grown in India disappears in local consumption, but the export trade chiefly from Madras and Rangoon is of considerable value. The total value of the exports

**Exports—**

**(1) Unmanufactured tobacco.**

of tobacco, manufactured and unmanufactured, in 1913-14, exceeded £319,000, of which roughly two-thirds was unmanufactured, the corresponding figure for 1922-23 being £551,000, of which seven eighths was unmanufactured. The following table shews the value of India's export trade in unmanufactured tobacco which for the most part consists of crudely cured leaf, from 1913-14 onwards.

TABLE NO. 217.—Quantity and value of unmanufactured tobacco exported from 1913-14 onwards.

Year.	Quantity.	Value.
	Lbs.	£
1913-14 . . . . .	27,817,000	211,800
1914-15 . . . . .	16,480,000	144,600
1915-16 . . . . .	24,250,000	201,300
1916-17 . . . . .	27,742,000	253,000
1917-18 . . . . .	20,244,000	238,500
1918-19 . . . . .	31,508,000	549,000
1919-20 . . . . .	28,950,000	493,000
1920-21 . . . . .	23,306,000	423,100
1921-22 . . . . .	22,903,000	409,800
1922-23 . . . . .	21,596,000	483,300

The principal destinations in 1913-14 were Aden and its dependencies, Hongkong, France, the Straits Settlements (including Labuan), the Federated Malay States, Holland and Germany. Burma tobacco was at one time used in the manufacture by the French Government of the *caporal* cigarette, the supplier being on the outbreak of war a German American. Exports to France from Rangoon amounted in 1913-14 to over 3 million lbs. and in 1915-16 to over 6½ million lbs. In the following year France dropped out of this market altogether but took

increased supplies from Bengál. Morocco was another temporary customer for Burma tobacco, her receipts for 1916-17 being 288,000 lbs., as compared with 358,920 lbs. in the previous year. There are also large shipments of unmanufactured tobacco from Burma to Hongkong for the China market. The increase in the export of unmanufactured tobacco to the United Kingdom during the war is ascribed in part to Dutch buyers who gambled on the possibility of being allowed eventual re-export to Holland. In 1918-19 France was by far the largest customer for Indian tobacco, with over 13 million lbs., followed by Aden with 6,400,000 and the Straits Settlements with just over and the United Kingdom a little less than three millions. In 1922-23 the United Kingdom took 3.6 million lbs. as compared with nearly 3 million lbs. in the preceding year, while there were no shipments to France as against 2 million lbs. in 1921-22. Germany took 3 million lbs. as against 16,000 lbs. in 1921-22, the Straits Settlements 3.6 million lbs. Hongkong 3 million lbs. and Aden and its dependencies, 4½ million lbs. The share of the various provinces is shown in the following table. The principal ports participating in the trade were Rangoon, Bombay, Calcutta and Negapatam.

TABLE NO. 218.—*Provincial share of exports of unmanufactured tobacco in 1913-14 and 1922-23 contrasted.*

Provinces.	1913-14.		1922-23.	
	Quantity.	Per cent.	Quantity.	Per cent.
Burma	Lbs. 11,655,612	42	Lbs. 8,954,488	41
Bombay and Sind	9,913,490	35½	4,759,520	22
Bengal	4,013,705	14	3,623,572	17
Madras Presidency	2,234,511	8½	4,258,743	20

The unit of sale in Calcutta and in Bombay is the maund of 82½ lbs., but in the latter market, the bale of 560 lbs. is also recognised. Shipment is made from the former port in bales of 400 lbs. nett and from Bombay in bales of 2, 2½ and 5 cwts. each. In Rangoon sales are made per hundred vis of 360 lbs. and tobacco is shipped in bales of 180 to 200 lbs., bundles of 90 lbs. nett or in cases weighing about 365 lbs. nett. In Negapatam the unit of sale is the seer of 24 tolas and tobacco is packed for export in bundles weighing from 28 to 224 lbs.

As regards manufactured tobacco, the value of the imports has always exceeded that of the exports, and the difference has recently been accentuated by the increasing demand for cigarettes on the part of all classes of the population who are no longer content to smoke the indigenous *biri*. This demand has at the same time encouraged the opening of a number of factories for the manufacture of

(2) **Manufactured tobacco.**

cigarettes in India of which the Peninsular Tobacco Company's concern at Monghyr is by far the largest. There are also considerable imports into Bombay and Calcutta of cigars from the Philippines and Havana. There was formerly a good market for 'Burma' and 'Trichy' cheroots in the Far East, but in recent years a marked preference has been shewn in that market for Manillas. A limited quantity finds a sale in the United Kingdom. Indian leaf tobacco makes an excellent filler, but is generally unsuitable for wrappers, and to meet this deficiency there is a considerable import of leaf from Sumatra and Java. When the import duty on foreign leaf was enhanced a few years ago the principal factory producing 'Trichy' cigars for export was temporarily transferred to Pondicherry, but they are now manufactured at Dindigul in bond under Customs supervision. The Government of Bengal have recently opened a factory at Rangpur to pioneer the production of cigars in that province. Much of the tobacco grown in the east coast districts of Madras is shipped to Rangoon for conversion into Burma cheroots, though there is a good deal manufactured in Cocanada for export as well as local consumption. The exports of unmanufactured tobacco from Bengal and Madras to Rangoon have greatly declined in recent years, the totals for 1913-14 being 12,441,929 and 4,763,886 lbs., respectively, and for 1922-23, 1,805,809 and 1,856,362 lbs. only. The lowest qualities of Indian tobacco are shipped to Europe for tanning purposes. The chief customers for Indian cigars in pre-war times and in 1922-23 are contrasted below.

TABLE NO. 219.—Principal countries importing Indian cigars in 1913-14 and 1922-23.

Countries.	Quantity.	
	1913-14.	1922-23.
	Lbs.	Lbs.
Straits Settlements and Federal Malay States . . . . .	1,602,041	152,622
United Kingdom . . . . .	88,033	38,719
European Turkey . . . . .	30,663	1,260
Siam . . . . .	14,684	44,739
Gibraltar . . . . .	13,950	..
Germany . . . . .	9,506	800
Aden . . . . .	7,830	3,850
Ceylon . . . . .	5,990	22,236
Sumatra . . . . .	..	16,950
Java . . . . .	..	10,628
<b>TOTAL (INCLUDING OTHER COUNTRIES)</b> . . . . .	<b>1,826,635</b>	<b>318,173</b>

The largest demand is from the Malay Peninsula and is likely to continue so though it is scarcely one-tenth of what it was before the war. The trade with Gibraltar has apparently been extinguished by the war but Siam is an improving market. The quantity and value of manufactured tobacco (which includes cigarettes and 'other sorts' as well as cigars) exported from 1913-14 will be found in the next table.

TABLE No. 220.—Quantity and value of manufactured tobacco exported from 1913-14 onwards.

Year.	Quantity.	Value.
	Lbs.	£
1913-14 . . . . .	2,208,000	107,800
1914-15 . . . . .	2,192,000	100,880
1915-16 . . . . .	2,095,000	92,150
1916-17 . . . . .	1,870,000	100,130
1917-18 . . . . .	1,620,000	102,860
1918-19 . . . . .	1,477,000	93,206
1919-20 . . . . .	1,927,000	124,000
1920-21 . . . . .	1,379,000	76,000
1921-22 . . . . .	1,325,000	66,000
1922-23 . . . . .	1,453,000	68,000

The distribution of the export trade in manufactured tobacco among the various provinces is shewn in the table below.

TABLE No. 221.—Provincial share of exports of manufactured tobacco in 1913-14 and 1922-23 contrasted.

Provinces.	1913-14.	1922-23.
	Per cent.	Per cent.
Burma . . . . .	38	58
Bengal . . . . .	15	27
Madras . . . . .	45	12
Bombay and Sind . . . . .	2	3

The ports chiefly participating in the trade in 1913-14 were Negapatam (30 per cent), Moulmein (25 per cent), Calcutta (15 per cent), Rangoon (12 per cent) and Madras (10 per cent); and in 1922-23, Rangoon (44 per cent), Calcutta (27 per cent), Moulmein (13 per cent), Dhanushkodi (6 per cent), Negapatam (4 per cent) and Bombay (2 per cent).

For Indian-made cigarettes the principal customers were up to 1914 Zanzibar and East Africa, but the war directed the bulk of this trade to the Persian Gulf.

#### MICA.

Ten years ago about three-fifths of the world's production of mica was derived from India, the bulk of the balance being contributed by

the United States and Canada though German East Africa was making considerable headway. A feature of the war was the considerable development of mica mining in Brazil. Practically all the mica mined in India is muscovite, though small quantities of phlogopite are won in Travancore.

Muscovite mica is obtained from two principal areas: (1) the Bihar mica belt, a strip of country about 12 miles broad and 60 to 70 miles long, running obliquely across the districts of Hazaribagh, Monghyr and Gaya in the province of Bihar and Orissa, and (2) the Nellore district of the Madras Presidency. In addition there are small workings in Ajmer, Udaipur, Mysore and Orissa. It is impossible to give accurate figures of production from these different fields, which differ considerably not only in the

quantity but also in the quality of their output. In 1922 the output of dressed mica from Bihar was put at 1,470 tons, from Nellore at 62 tons (as compared with 300 tons in 1917), Ajmer-Merwara 31 tons, Mysore 7 tons, Central Provinces 5 tons and the Nilgiris 3 tons, but these figures must be regarded as rough estimates only. Bihar mica exported from Calcutta is principally of the *ruby* variety, the higher qualities of which known as *clear* and *slightly stained* are regarded as the finest micas in the world and are of great importance in certain electrical industries for their high dielectric co-efficient. Nellore mica is principally *green* mica and is shipped from Madras, while Rajputana mica, which is exported from Bombay, is of inferior quality, though the statistics below might suggest otherwise. The consignments from Calcutta and Madras probably contained a larger percentage of splittings. The following statement gives the quantities and average values per cwt. of mica shipped from each area in the years 1913-14 and 1922-23.

TABLE NO. 222.—Quantities and average values per cwt. of mica shipped from the principal ports in 1913-14 and 1922-23.

Ports.	1913-14.		1922-23.	
	Quantity.	Average value per cwt.	Quantity.	Average value per cwt.
	Cwt.	£ s. d.	Cwt.	£ s. d.
Calcutta . . . . .	41,313	5 14 7	57,649	6 15 7
Madras . . . . .	10,871	5 3 9	2,074	6 3 10
Bombay . . . . .	1,707	5 10 1	111	12 12 3
TOTAL (INCLUDING OTHER PORTS)	53,891	5 12 3	59,846	6 15 5

The following statement compares the quantities and average values per cwt. of Indian mica imported into the United Kingdom with the quantities and average values of mica from the United States of America Canada and Brazil.

TABLE NO. 223.—Quantities and values of imports into the United Kingdom of Indian mica contrasted with those from the United States of America, Canada and Brazil.

Country of Origin.	1915.		1916.		1920.		1921.		1922.	
	Quantity.	Average value per cwt.								
	Cwt.	£ s. d.								
British India . . . . .	40,178	8 11 7	50,018	9 1 5	55,820	10 2 7	21,180	11 5 11	15,640	10 16 8
Canada . . . . .	1,388	5 9 6	780	15 9 0	"	"	"	"	"	"
United States of America . . . . .	889	1 8 0	2,755	2 9 5	7,320	3 17 0	1,680	4 0 8	4,060	2 2 1
Brazil . . . . .	"	"	217	21 18 10	220	18 11 8	189	26 15 9	100	9 17 2

\* Information not available.

The methods of mining in Bihar and Nellore are not identical. In the latter field, owing to the flat nature of the ground, will be found

**Mining.** large open quarries, while in Bihar, where the surface is irregular, veins are followed up by winzes, shafts, stops and drives. Exploitation has often been haphazard and uneconomical, but some of the wealthier firms engaged in the industry have during recent years introduced more scientific methods, and labour-saving machinery has been successfully introduced to assist the inadequate supply of local labour for the removal of water and debris. Altogether mica mining in India gives employment to about 15,000 persons.

After being raised to the surface, mica has to be prepared for the market. Madras mica is *shear-trimmed* into rectangular plates, while

**Preparation for market.** Bihar mica is *sickle dressed, i.e.,* trimmed by means of the country sickle. This method produces irregular shapes as all cracks and flaws are cut out, but is also less wasteful, for it leaves no square corners to fray out, the blocks are more easily split and it has this additional advantage that sickle-dressed mica is not considered as 'manufactured mica' for tariff purposes, on import into the United States of America. After trimming with the sickle, Bihar mica is sized, a process which is based on the greatest number of square inches which can be measured as a rectangular figure, the irregularities due to cutting being left out of account. The largest size is known in the trade as 'extra special' (over 48 sq. inches), while blocks containing from 36 to 48 sq. inches are classed as 'special' and below that there are seven grades, the lowest (No. 7) being of 1 sq. inch only. Each size is then graded according to quality—*clear, slightly stained, fair stained, heavily stained, black spotted, etc.*

Originally the smaller sizes of mica had little or no commercial value, and these with the trimmings and other waste were dumped close to

**Scrap mica.** the mine or factory. The installation of grinding plants to convert these trimmings into boiler and pipe lagging, etc., has hitherto been scarcely attempted in India in the absence of an assured market for their production though they form part of the equipment of almost every mine of any size in America.

For the manufacture of micanite, micaplates of small size (generally No. 5 and No. 6 block) are split by means of sharp pointed knives

**Micanite.** into thin flakes which, with the aid of shellac dissolved in spirit, are cemented together under pressure and built up into sheets of any required size and thickness. The varieties most commonly known are micanite 'board,' 'cloth' and 'paper.' The micanite is steamed, rolled and trimmed and finally shaped. For the preparation of splittings from mica block, women and children are extensively employed in the mica fields. Micanite has been made at Kodarma, the centre of the Bihar mica industry, and in the East Indian Railway workshops at Jamalpur. There is no reason why condenser plates, funnels and other mica manufactures should not also be undertaken in India.

At present exports are chiefly in the form of block mica and splittings which are packed in boxes lined with paper and calculated to weigh about 1 cwt. nett each, the unit of sale being the bazaar maund in Calcutta and the cwt. in Madras. Quotations for export are generally based on the lb. *f.o.b.* The following are the statistics of exports of mica from India from 1913-14 onwards. There are, it will be noticed, considerable variations in average value from year to year partly attributable to the proportion of block mica to splittings in the shipments. The considerable increases in price per cwt., recorded during 1917-18 and 1918-19, for example were largely due to a larger percentage of block mica in the total shipments, which again was due to an increased demand for better quality mica for munition purposes. In 1922-23 the price obtained for splittings was so low that though the volume of exports was 120 per cent in excess of that for 1921-22, the total values were actually 4 per cent lower.

TABLE No. 224.—Exports of mica from India from 1913-14 onwards.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	53,891	302,564
1914-15 . . . . .	32,972	191,066
1915-16 . . . . .	33,717	208,496
1916-17 . . . . .	59,521	341,255
1917-18 . . . . .	65,729	575,285
1918-19 . . . . .	55,992	598,971
1919-20 . . . . .	60,648	574,443
1920-21 . . . . .	71,276	674,254
1921-22 . . . . .	27,132	422,271
1922-23 . . . . .	59,846	405,170

The internal consumption of mica in India is very small and probably does not exceed two or three hundred tons per annum. Of the principal ports participating in the export trade the percentage shipped from Calcutta in 1922-23 was 96, from Madras 3 and from Bombay 1. In 1914 Germany held a predominant position in the electrical industry and the world's mica market was about to be transferred from London to Hamburg. The distribution of the trade according to the Custom House statistics would suggest that nearly 60 per cent of the whole went to the United Kingdom, 19 per cent to the United States and rather less than 16 per cent to Germany, but not less than half of the shipments to the United Kingdom were re-exported to Germany whose consumption of Indian mica in the calendar year 1913 was 47,000 cwts. in addition to about 10,000 cwts. obtained from her colonies. The outbreak of hostilities suspended the activities of a German merchant who had begun to build up a big business in the mining and shipping of mica from the Nellore field. The mica sent direct to the United States was of higher average value than to other destinations, as only the superior grades can stand the heavy import duty.

The first effect of the war was to discourage the output and diminish the volume of the exports of mica, but a considerable demand soon grew up for Indian mica for munition purposes.

**Control.** To secure adequate supplies for the British Government, exports to destinations other than the United Kingdom were prohibited in September 1915, and in June 1916 a scheme to purchase on Government account was brought into force. The Government of India also took great interest in exploiting mica-producing areas hitherto untouched or incompletely developed.

All restrictions on the export of mica were removed in October 1919. In the following year 86 per cent of the exports went to the United Kingdom and 12 per cent to the United States of America, while the average value per cwt. declined owing to heavy consignments of splittings. In 1922-23 the chief recipients were the United States of America (56 per cent), the United Kingdom (30 per cent) and Germany (10 per cent).

## CHEMICALS AND PREPARATIONS.

### Saltpetre.

Saltpetre (potassium nitrate) is in considerable demand for industrial purposes, *e.g.*, in connection with the manufacture of glass,

for food preservation, and for manurial purposes in addition to its importance as a constituent of gunpowder. The production of saltpetre in India is practically confined to the areas covered by the three provinces of Bihar, the United Provinces and the Punjab in all of which places the manufacture is controlled under a system of licenses by the Northern India Salt Revenue Department. Farrukhabad in the United Provinces may be cited as the main centre of manufacture, though the refined saltpetre produced in the Punjab excels that of any other province. Small quantities sufficient only for local consumption are obtained in Madras as well as in a few Indian States in the north. With the outbreak of the war the Indian output was stimulated by a reduction of license fees for crude manufacture and the opening of fresh areas for the production, and other concessions to encourage manufacture. Later on the export of saltpetre exceeding 10 per cent refraction (impurity) was prohibited and the export of saltpetre of lower 'refraction' restricted to the United Kingdom, at prices subject to fixed maxima, until the 4th January 1919, when all restrictions were removed. The number of refineries decreased from 327 in 1913-14 to 314 in 1922-23 and the number of licenses in the three provinces from 31,191 to 16,371. 73 per cent of the licenses for preparing crude saltpetre were granted in Bihar, in which province 60 per cent of the refineries are situated. The production of refined saltpetre in factory maunds (of 74·67 lbs. each) may be indicated by the following statement. Production in Bihar and the United Provinces has declined, but there has been a considerable increase since 1914-15 in the Punjab

TABLE NO. 225.—Production of refined saltpetre in factory maunds of 74.67 lbs.

Year.	Bihar.	United Provinces.	Punjab.
	Factory maunds.	Factory maunds.	Factory maunds.
1913-14 . . . . .	185,373	169,756	87,010
1914-15 . . . . .	222,123	189,396	106,176
1915-16 . . . . .	219,565	236,658	152,301
1916-17 . . . . .	241,038	300,566	245,976
1917-18 . . . . .	230,431	258,838	156,058
1918-19 . . . . .	204,681	289,485	206,882
1919-20 . . . . .	205,641	158,287	149,174
1920-21 . . . . .	165,065	133,473	148,345
1921-22 . . . . .	154,076	104,260	133,996
1922-23 . . . . .	47,859	54,517	127,504

Crude saltpetre is extracted from nitrous earths scraped during the dry season from the roads, walls, etc., in and around villages where a large quantity of nitrogen is derived from the excreta

of men and animals and decayed vegetable matter.

**Manufacture.**

This earth is laid in shallow filter beds of clay and water poured over it and the resulting liquor after settling is concentrated in large open pans over a slow fire (as in the United Provinces and Bihar) or evaporated by solar heat (as in the Punjab), crystallizing out in the form of crude saltpetre which contains a considerable admixture of common salt. The terms of the license issued to the *nooniah* (crude saltpetre licensee) do not allow him to carry the process any further. Refining is carried out in licensed premises either by continuing the process applicable to the manufacture of crude saltpetre till the eduction of the salt mixed up with it, or by heating to boiling point a solution of crude saltpetre, when the potassium nitrate dissolves and the common salt contained in it crystallizes out. By evaporating the remaining solution, fairly pure saltpetre may be obtained. The process chiefly in vogue in the Bihar refineries is the former, and the product so obtained is known as *kuthia*. It has a refraction of from 20 to 40 per cent and a good demand for it exists for manurial purposes and for the manufacture of fertilizers. A much more highly refined article is produced in the Punjab with a refraction in the neighbourhood of 4 per cent, while in Bihar anything better than 8 per cent is seldom achieved. The crude product of the United Provinces and Bihar yields as a rule from 40 to 50 per cent refined saltpetre, but the percentage in the Punjab is no more than 30.

Up to the year 1860 India enjoyed a monopoly in the saltpetre trade when artificial manufacture from the nitrate deposits of South America and German potash knocked the bottom out

**Exports.**

of the export trade which fell from 35,000 tons in 1859 to 13,400 tons in the last pre-war year. India's chief customers are China, the United Kingdom, Mauritius and Ceylon. The two last named are satisfied with high refraction saltpetre for manurial purposes, while China takes better quality Farrukhabad and Punjab refined saltpetre for fire-works.

TABLE NO. 226.—Destinations and quantities of saltpetre exported in 1913-14 and from 1919-20 onwards.

Countries.	1913-14.	1919-20.	1920-21.	1921-22.	1922-23.
	Tons.	Tons.	Tons.	Tons.	Tons.
United States of America . . . . .	1,390	1,679	3,891	466	103
China . . . . .	4,034	2,231	2,252	2,540	2,277
United Kingdom . . . . .	2,464	5,532	5,540	4,341	2,119
Mauritius . . . . .	1,437	2,301	5,391	1,494	2,096
Ceylon . . . . .	2,224	4,960	1,833	2,236	2,547
All other countries . . . . .	1,854	1,846	577	670	1,455
<b>TOTAL</b> . . . . .	<b>13,403</b>	<b>18,549</b>	<b>19,484</b>	<b>11,747</b>	<b>10,597</b>

With the outbreak of the war, the trade was mainly diverted to the United Kingdom, whose chief sources of supply, Germany and Belgium, had been cut off and the Ministry of Munitions looked to India to meet its constantly increasing demands. Whereas the share of the United Kingdom was 55 per cent in 1914-15, it was 80 per cent in 1915-16, and in 1916-17, when the new restrictions on export became effective, 87 per cent. Small quantities were permitted to go to Australia and New Zealand for meat preservation and to Mauritius and Ceylon for manurial purposes, but with this exception India's whole output of saltpetre was earmarked for the use of British or Allied manufacturers of munitions.

The following table illustrates the range of prices for saltpetre of 5 per cent refraction from 1914.

**Prices.**

TABLE NO. 227.—Price of saltpetre of 5 per cent refraction per factory maund (74.67 lbs.) from 1914 onwards.

Year.	January.		July.	
	Rs. a.	s. d.	Rs. a.	s. d.
1914 . . . . .	12 8	16 8	11 4	15 0
1915 . . . . .	11 12	15 8	11 4	15 0
1916 . . . . .	13 4	17 8	15 8	20 8
1917 . . . . .	14 0	18 8	14 12	19 8
1918 . . . . .	15 4	20 4	14 12	19 8
1919 . . . . .	14 0	18 8	13 0	17 4
1920 . . . . .	12 0	16 0	15 0	20 0
1921 . . . . .	11 0	14 8	17 0	22 8
1922 . . . . .	16 0	21 4	17 8	23 4
1923 . . . . .	15 0	20 0	13 0	17 4

Early in 1916 owing to a marked rise in prices as a result of market manipulation for the benefit of the middlemen rather than of the manufacturer, the Government of India intervened and fixed maximum rates for exports, viz., Rs. 13-12 (18s. 4d.) for a factory maund of 5 per cent (or less) refraction and Rs. 12-14 (17s. 2d.) for 10 per cent refraction *f.o.b.*, the refraction values being determined by the Chemical Examiner, Calcutta Custom House, upon samples drawn from the con-

signments which were under Customs control ; but there is reason to believe that there was a good deal of evasion practised in order to defeat these restrictions.

The revision of these rates was under consideration when the armistice was declared and with it the United Kingdom's demand for munition purposes ceased and shortly afterwards all restrictions on the export of saltpetre of all grades were removed. The most recent rates quoted are, it will be seen, in the neighbourhood of the maxima fixed by Government during the period of control.

TABLE NO. 228.—*The exports of saltpetre (quantities and values) to all destinations in 1913-14 and from 1918-19 onwards.*

Year.	Quantity.	Value.
	Tons.	£
1913-14 . . . . .	13,400	206,600
1918-19 . . . . .	23,900	621,660
1919-20 . . . . .	18,549	387,725
1920-21 . . . . .	19,484	472,747
1921-22 . . . . .	11,747	275,434
1922-23 . . . . .	10,597	242,519

Practically all the shipments are made from the port of Calcutta. The local unit of sale is the factory maund but sterling quotations to the United Kingdom are per ton *c.s.f.* The unit of shipment in Calcutta is the bag of 224 lbs. nett, but shipment is made from Bombay in bags of 168 lbs. gross also.

#### Borax.

Borax (sodium bi-borate) is not found in British India but is obtained in conjunction with salt on the banks of certain lakes in Tibet or as a deposit in conjunction with sulphur of certain hot springs in Ladakh, Kashmir. The latter

supplies enter India generally *via* Kulu and are refined at Sultanpur, or alternatively through Chamba to Kashmir and Lahore while *tinca*, the Tibetan product which constitutes nine-tenths of the trade, is brought into the United Provinces by Bhutia traders and is refined at Ramnagar. The transfrontier imports of borax in recent years have been in the neighbourhood of 22,000 cwts. yearly, the figures for 1921-22 and 1922-23 being 22,219 and 21,507 cwts., respectively. The annual imports of refined borax by sea, chiefly from the United Kingdom, average about 5,000 cwts.

The export (strictly re-export) trade has been steadily declining in recent years owing to the discovery of inexhaustible supplies of calcium borate in Nevada and California, but the internal consumption for medicinal purposes and

as a mordant in dyeing and calico printing and other industrial purposes has somewhat increased, the balance struck by deducting shipments from the sum of the transfrontier and sea-borne imports giving a total of about 25,000 cwts. per annum.

The quantity and value of borax exported during the last ten years are shewn in the following table.

TABLE No. 229.—Quantity and value of exports of borax from India from 1913-14 onwards.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	4,270	5,131
1914-15 . . . . .	4,461	6,191
1915-16 . . . . .	6,252	10,010
1916-17 . . . . .	7,353	14,102
1917-18 . . . . .	2,873	5,875
1918-19 . . . . .	4,939	10,634
1919-20 . . . . .	4,381	9,419
1920-21 . . . . .	5,174	10,875
1921-22 . . . . .	5,463	13,189
1922-23 . . . . .	3,195	8,115

Formerly the principal destinations were the Straits Settlements and Hongkong and the war has not materially affected the distribution of the trade. Over 90 per cent of the exports have always gone from Calcutta. The unit of sale in Calcutta is the bazaar maund and shipment is made in cases weighing 1 cwt. each. Quotations for export are per maund *f. o. b.*

#### RAW SILK.

There are three tracts in India in which sericulture is still a cottage industry of some importance, (1) the southern portion of the Mysore plateau with the adjoining *taluk* of Kollegal in the Coimbatore district of the Madras Presidency, (2) the Murshidabad, Malda, Rajshahi and Birbhum districts of Bengal, and (3) Kashmir and Jammu with the neighbouring submontane districts of the Punjab and North-West Frontier Province in all of which the mulberry feeding silk worm (*bombyx mori*) is cultivated. There is also a considerable cultivation in Chota Nagpur and Orissa and parts of the Central Provinces of the *tasar* silk worm and in Assam of the *muga* and *eri* silk worm. All these are purely indigenous. The *tasar* is a wild silk worm never successfully domesticated; the *muga* is a semi-domesticated silk worm feeding in the open, chiefly on two particular species of laurel; while the *eri* is a domesticated silk worm feeding on castor, the silk from which cannot be reeled but has to be carded and spun. Both in Bengal and Southern India the silk is the produce of a multi-voltine worm fed on the leaves of the shrub mulberry. The Mysore industry, supposed to have been started by Tipu Sultan with seed received from China, with that in the adjoining district of Coimbatore, is now responsible for two-thirds of the total output of silk in India. A good deal of experimental work has been done in Bengal and Mysore in recent years under the direction of French and Japanese experts, and the area of land under mulberry cultivation in Bengal has been found to have increased by 33 per cent since 1913. In Kashmir, where mulberry trees are abundant and the historical records of the industry go back to the sixteenth century, only uni-voltine worms chiefly from seed imported every year from France and Italy are now grown. The industry is a State monopoly,

and the only limit to its expansion is the amount of food available for the worms. The output of silk in Kashmir is on a conservative estimate 200,000 lbs. of reeled silk annually, the whole of which is exported. In the Murshidabad district are several filatures under European control, but there are in India actually only two filatures working on European lines, one in Bangalore and one in Srinagar. Of the filatures in which indigenous methods are employed, there are five establishments in Murshidabad district employing a hundred or more operatives, and one in Jammu.

Mr. Lefroy's estimate of the production of mulberry silk in India in 1916 when the reeling industry in Kashmir had not completely recovered from the disastrous fire which destroyed the Srinagar filature in 1913, is given in the table below.

**Production.**

TABLE No. 230.—Estimated production of mulberry silk in India in 1916.

Provinces.	Quantity.
	Lbs.
Mysore . . . . .	1,152,000
Bengal . . . . .	600,000
Madras . . . . .	400,000
Kashmir . . . . .	98,000
Burma . . . . .	15,000
Assam . . . . .	12,000
Punjab . . . . .	1,800
TOTAL . . . . .	2,276,800

It has been calculated that it takes 12 maunds of cocoons to yield one maund of reeled silk.

In the early days of the East India Company silk was an important article of the export trade from Bengal and in the time of Warren

Hastings the exports averaged over 500,000 lbs., it is believed, of reeled silk alone; but the trade was subject to great fluctuation. Between 1866 and 1874 the average annual exports amounted to over two million lbs. including not only reeled silk but also *chasam* (silk waste) and cocoons. The average exports for decennial periods, from the statistical year 1864-65 onwards, are shewn in the following table.

TABLE No. 231.—Exports of raw silk during decennial periods from 1864-65 onwards.

Average for ten years.	Exports of raw silk.
	Lbs.
1864-65 to 1873-74 . . . . .	2,065,272
1874-75 to 1883-84 . . . . .	1,401,025
1884-85 to 1893-94 . . . . .	1,744,109
1894-95 to 1903-04 . . . . .	1,717,801
1904-05 to 1913-14 . . . . .	1,740,023
1914-15 to 1923-24 . . . . .	1,171,074

The above figures would suggest that since 1884 the trade had, until the war broke out, remained very steady, but unfortunately the proportion of reeled silk in the total (except for a temporary recovery in 1906-07 and the following year) has greatly declined and with it the average value of the whole. There was a remarkable fall in 1913-14 to 160,222 lbs., as compared with 382,081 lbs. in 1912-13, but this was largely ascribable to the Srinagar fire in July 1913 in consequence of which the exports from Kashmir in the following year were chiefly in the form of cocoons. In 1914-15 the effect of the war was greatly felt, as so much of the trade is in normal times with Southern France. The exports of raw silk, *chasam* and cocoons from India in 1913-14 and during the last five years are shewn in the following table. With higher prices and a larger demand from France in 1918-19 there was something of a recovery in the shipments of reeled silk and a corresponding fall in the volume of cocoons exported, and the figures for 1922-23 shew little variation on those for 1919-20.

TABLE No. 232.—Quantity of exports of raw silk, *chasam* and cocoons from India in 1913-14 and during the last five years.

Articles.	1913-14.	1918-19.		1919-20.	1920-21	1921-22.	1922-23.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Raw silk . . .	160,222	290,989	179,671	128,990	96,037	173,493	
Chasam . . .	909,077	551,299	1,166,900	921,850	984,453	1,010,239	
Cocoons . . .	133,789	112,680	104,429	111,879	60,264	61,234	

The principal destinations throughout the period were France, the United Kingdom, Italy and Siam. The chief ports participating in the trade were Karachi, which has superseded Bombay as the principal entrepôt for the Kashmir trade (though there are still considerable exports from Bombay), Calcutta for Bengal and Assam silk, and Madras for *chasam* and cocoons from Mysore, shipments of raw silk from the last named port having ceased since 1906-07.

In Karachi the unit of sale is the lb. and of shipment the bale of 165 lbs. (two standard maunds nett) while in Calcutta raw silk is sold by the factory seer and shipped in bales of 150 lbs. each. *Chasam* is shipped in 300 lb. bales. Mysore *chasam* is sold per maund of 25 lbs. *f.o.b.* Madras, for shipment to France and Italy, and packed for export in pressed bales of 3 cwts. *c.i.f.*, quotations to the United Kingdom are generally per lb. and for France per kilogramme.

#### SILK MANUFACTURES.

The decrease in the exports of silk manufactures from India has been even more noticeable in recent years than that of raw silk.

The census returns of 1921 recorded a decrease of 114,711 in the total of 257,249 persons enumerated in 1911 as engaged in the industry, the chief silk weaving centres being Murshidabad, Tanjore, Benares, Surat, Amritsar, Chingleput, Madura and Mandalay. On the other hand while the quantity of raw silk annually imported chiefly from Shanghai is about the same as it was fifty years ago, the bulk of the imports consists now-a-days

of fine weaving qualities, whereas it was formerly coarse and suitable only for embroidery. In Burma, where the material is worn by all but the poorest of both sexes, the absorption of silk piecegoods is remarkable, and in that province there is reason to fear that the competition of Japanese manufactures is becoming too strong for the village hand-looms. The value of Japanese imports before the war exceeded £300,000 annually. In other parts of India there is still a good market for certain superior qualities of hand-woven silk piecegoods with which no power loom products directly compete and the decline in the number of persons engaged in silk weaving would account for the corresponding decline in the volume of exports between 1911 and 1921. Most elaborate patterns are worked out with the aid of dobbies and jacquard harness, and the beautiful silk brocades (known as *kincobs*) liberally interspersed with metallic threads for which Benares and Madura are famous, command appreciation even in the West. While the war lasted, considerable difficulty was experienced by silk weavers in obtaining the necessary supplies of dye-stuffs. There are two considerable power mills, manufacturing silk goods in Bombay, and one in Calcutta, Ahmedabad and Bangalore respectively, in the two latter cases in conjunction with other textiles.

The value of foreign silk consumed by weavers in Bombay city and other parts of the Bombay Presidency is estimated at about £100,000 annually. 800,000 lbs. is the estimated consumption of raw silk in the Madras Presidency

**Raw silk consumption.** derived as follows:—360,000 lbs. from Kollegal, 300,000 lbs. from Mysore, 100,000 lbs. from China *via* Tuticorin and Bombay, and 40,000 lbs. from Bengal. With this silk worth from £330,000 to £370,000, piecegoods worth nearly £660,000 are produced, of which £640,000 are absorbed in the Presidency £10,000 go to other parts of India and the remaining £10,000 are available for export.

There has as remarked above been a general decline in the exports of silk manufactures of recent years. In 1893-94 the total exports from

**Exports.** British India were valued at £162,000 and in 1903-04 at £55,000. The figures from 1913-14 onwards are given in the table subjoined. About 53 per cent of the shipments in 1922-23 were from Bombay, 37 per cent from Bengal and 8 per cent from Madras.

TABLE No. 233.—Quantity and value of silk manufactures exported from 1913-14 onwards.

Year.	Quantity.	Value.
	Yds.	£
1913-14	566,367	37,740
1914-15	374,764	22,980
1915-16	365,096	22,111
1916-17	419,885	36,353
1917-18	258,364	22,227
1918-19	823,282	82,364
1919-20	371,689	36,824
1920-21	271,489	33,879
1921-22	155,908	19,529
1922-23	131,588	14,878

The above table includes goods made of silk mixed with other materials but is exclusive of small quantities of sewing thread and 'other sorts' of silk manufactures, averaging in the post-war period about 1,800 lbs. in weight valued at £750. Shipments between 1914-15 and 1917-18 were of course affected by the war. In preceding years the principal recipient was the United Kingdom, chiefly in the form of piecegoods, while the French and Levantine markets, once very important, had for a long time been negligible. In 1918-19 there was a marked development of the trade between Bombay and the Persian Gulf. There have recently been increased shipments of pure and smaller shipments of mixed silk goods, but the trade seems moribund.

In the transfrontier trade there are not inconsiderable exports of silk piecegoods across the borders of Burma to the Southern Shan States, against which may be set similar imports from Siam, and of raw silk from Western China.

#### BRISTLES AND FIBRE.

Among the other raw materials exported are bristles and fibre for brushes and brooms.

The bristles are chiefly pigs' bristles which are collected in the United Provinces, graded, and either absorbed by the local trade or shipped from Calcutta and Bombay for the foreign market which takes certain qualities for which

there is no demand in India. There is a small factory at Cawnpore which manufactures every variety of household brushes and a very high grade of toilet brushes, chiefly with these bristles. A similar factory has been started at Indore. Bristles plucked as in the United Provinces from the living animals are rated superior to those obtained from carcases. The quantities and values of exports are shewn in the sub-joined table.

TABLE NO. 234.—Exports of bristles (quantities and values) from 1913-14.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	4,093	92,948
1914-15 . . . . .	4,747	92,327
1915-16 . . . . .	3,865	82,586
1916-17 . . . . .	3,728	87,943
1917-18 . . . . .	2,522	92,724
1918-19 . . . . .	2,746	117,897
1919-20 . . . . .	2,209	76,047
1920-21 . . . . .	4,063	125,211
1921-22 . . . . .	1,899	74,937
1922-23 . . . . .	2,651	93,701

The chief destination was the United Kingdom and, before the war, Germany also to a small extent. In Calcutta the unit of sale is the bazaar maund, but shipment is usually made in cases weighing one cwt.

nett. In Bombay sales are made by the lb. and bristles are shipped in cases weighing 50 lbs. nett. Sterling quotations are generally per lb. c. t. f.

Palm fibre is derived chiefly from the palmyra (*Borassus flabelliformis*), the bulk of it being exported from Tuticorin and Cocanada to the United Kingdom, to be made up into brooms. It is obtained from the leaf stalks of seedling palmyras

which are widely distributed over Southern India, but the only tracts in which the industry is important are the uplands of Kistna and Godavari, Tinnevely, the Palghat sub-division of Malabar, and south Travancore. The fibre is sold and shipped either dyed or undyed after grading into lengths, the principal grades being 15 to 18 inches and over, 12 to 14 inches and 8 to 12 inches. Each consignment should contain equal quantities of each grade. The exports of palmyra fibre in 1913-14 and from 1918-19 onwards are shewn in the following table.

TABLE No. 235.—Quantities and values of palmyra fibre exported in 1913-14 and from 1918-19 onwards.

Year	Quantity	Value
	Cwts.	£
1913-14 . . . . .	80,440	89,097
1918-19 . . . . .	58,374	81,527
1919-20 . . . . .	161,142	262,117
1920-21 . . . . .	45,420	72,339
1921-22 . . . . .	60,940	86,418
1922-23 . . . . .	82,560	113,110

Before the war Germany took 37 per cent, Belgium 30 per cent, the United Kingdom 18 per cent and Holland 7 per cent of the exports of this fibre. In 1922-23 the percentages of the principal countries participating were: Germany 28 per cent, Belgium 20 per cent, the United Kingdom and the United States of America each 13 per cent, Netherlands and Japan each 10 per cent. The chief ports of export and the proportionate share of each in the total trade in 1913-14 and 1922-23 are shewn in the next table.

TABLE No. 236.—Distribution of the trade according to ports in 1913-14 and 1922-23 contrasted.

Ports	1913-14		1922-23	
	Quantity	Percentage	Quantity	Percentage
	Cwts.		Cwts.	
Tuticorin . . . . .	28,009	35	36,000	44
Cocanada . . . . .	32,114	40	34,120	41
Calicut . . . . .	14,801	19	6,500	8
Cochin . . . . .	4,894	6	5,940	7
TOTAL	79,818	100	82,560	100

At Tuticorin the fibre is generally shipped in pressed bales of 300 lbs. nett, but bundles of one and two cwts. are not uncommon. At Cocanada the weight of the pressed bale is 280 lbs. nett and on the Malabar coast the ordinary unit of shipment is the pressed bale of 3 cwts. nett. The unit of sale at Cochin and Tuticorin is the cwt., but sales are made in Cocanada by the candy of 500 lbs.

### CANDLES.

Candles are manufactured either of stearine, or of paraffin wax with an admixture of stearine as at Syriam near Rangoon. In the latter case the purified wax is melted and run direct to the mixing tubs where a percentage of stearine, which is generally small, though in some makes as much as 50 per cent by volume, is added to increase the rigidity of the candle and to impart a skin which it would not otherwise possess on leaving the moulds. The wax is then poured into rows of block tin moulds and supplied with wicks, an average machine being capable of turning out 360 candles every fifteen minutes. Stearine candles are manufactured in Calcutta, Madras, Mysore and Bilimora (Baroda State) but the industry has not yet attained any considerable dimensions in any of these centres, as the table below shewing exports of all kinds of candles represents chiefly candles from Burma.

TABLE No. 237.—Quantity and value of exports of candles from India in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Lbs.	£
1913-14 . . . . .	8,395,078	157,890
1918-19 . . . . .	9,787,402	203,048
1919-20 . . . . .	11,478,655	237,017
1920-21 . . . . .	5,647,919	112,644
1921-22 . . . . .	6,034,434	119,963
1922-23 . . . . .	5,085,547	98,935

95 per cent of the exports go direct from Rangoon though latterly larger despatches have been made from Bombay. The principal destination are China, Ceylon, New Zealand, United Kingdom, and the Straits Settlements. Sales of paraffin wax candles are usually made per case of 25 packets for the Calcutta market and of 30 packets for the Madras, Bombay and Karachi markets, the weight of a packet varying with the weight of the single caudle. For foreign markets packings are scarcely standardised yet.

## DRUGS AND MEDICINES.

### Senna.

The senna of the British Pharmacopœia is derived from the leaves of *cassia angustifolia* and the chief source of supply outside the Sudan is the Tinnevely district of the Madras Presidency.

The plant is cultivated on special plots of land. No estimate of the area under cultivation, however, can be made but it has been stated that on dry land 700 lbs. of leaves per acre and on garden lands under wells as much as 1,400 lbs. may be obtained. Plucking commences generally 60 days after sowing, the leaves being stripped from the stalks, and if the flower buds are nipped off a heavier flush of leaves follows. After picking, the leaves are dried in the shade for a week or ten days and the senna is then ready for sale. Between the cultivator and the shipper is the inevitable middleman who mixes the leaves and bags them before selling to the exporter who has therefore to re-sort according to size and quality before baling. The usual season for collection runs from June to December.

The volume and value of the exports of senna in 1913-14 and since 1918-19 are shewn in the next table. Short shipments in the last two years of the war largely account for the exceptional quantity exported in 1919-20.

TABLE No. 238.—Quantities and values of exports of senna in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	26,450	26,425
1918-19 . . . . .	11,990	17,043
1919-20 . . . . .	51,933	120,871
1920-21 . . . . .	32,889	80,293
1921-22 . . . . .	41,717	64,703
1922-23 . . . . .	32,771	46,845

Indian senna has a good reputation for quality and price. In pre-war times the principal customers for senna were the United Kingdom, the United States of America, Germany and France. In 1922-23 the chief recipients were the United States taking 66 per cent of the total exports, France taking 13 per cent, the United Kingdom 6 per cent, and Germany 4 per cent. 99 per cent of the exports of senna go from Tuticorin, the unit of sale at the port being the candy of 500 lbs. and that of shipment, bales of 2½ to 2¾ cwts. each.

### Nux Vomica.

Nux vomica, which is commercially important as the source of the alkaloids strychnine and brucine, is the name given to the seeds of a deciduous tree widely distributed over India known as *strychnos nux vomica*. The fruits are collected between November and January and the seeds taken out and dried in the sun, the busy season for export on the West Coast running from February to the middle of May. Shipments are chiefly from Cochin, Madras, Cocanada, Bombay and Calcutta. Figures for the foreign trade from 1913-14 are given in the following table.

TABLE NO. 239.—Exports of nux vomica from India from 1913-14 onwards.

Year.	Quantity.	Value.	Average
			value per cwt.
	Cwts.	£	£ s.
1913-14 . . . . .	46,149	17,306	0 8
1914-15 . . . . .	33,161	14,556	0 8
1915-16 . . . . .	59,225	30,760	0 10
1916-17 . . . . .	56,148	31,137	0 10
1917-18 . . . . .	40,180	25,112	0 12
1918-19 . . . . .	62,158	57,603	0 18
1919-20 . . . . .	64,462	65,692	1 0
1920-21 . . . . .	72,087	118,221	1 13
1921-22 . . . . .	47,189	88,404	1 17
1922-23 . . . . .	33,066	37,250	1 3

The chief countries participating in the trade in pre-war times were the United Kingdom, Belgium, Germany, Holland and France, and in 1922-23 the United States of America (57 per cent), Belgium (13 per cent), the United Kingdom (11 per cent), Germany (10 per cent) and Netherlands (7 per cent). Practically all the Cocanada output went to New York. 'Fair general average of season, Europe cleaning' is the usual quality exported.

In Madras and Cocanada nux vomica is exported in bags containing 182 and 164 lbs. while on the Malabar coast the unit is a 140 lb. bag.

**Unit of sale and shipment.** Calcutta ships in  $\frac{1}{2}$  cwt. packets and Bombay in bags of 140 to 168 lbs. gross. The unit of sale in Bombay is the candy of 823 lbs., in Calcutta the bazaar maund and in the South the candy of 500 lbs. or 600 lbs. generally, garbled or ungarbled.

### Cinchona.

All the varieties of cinchona from which the commercial barks of to-day are obtained are represented in India, namely, *cinchona ledgeriana* (yellow bark), *cinchona succirubra* (red bark)

**Area and production.** and *cinchona officinalis* (pale bark) and hybrids therefrom. The plantations were first started in 1862 at the initiative of the Government from seed introduced from South America, but since then private efforts on the part of tea and coffee planters have

been responsible for some part of the increased production and consequent fall in price. The price of quinine which was Rs. 20 (£1-6-8) an ounce in 1878 had fallen to Rs. 12 (16 shillings) per lb. in 1890, and practically similar conditions prevailing in Java have kept the price at that level or lower ever since. The main areas in British India to which cultivation is now confined are the Nilgiri Hills, Coimbatore and Tinnevely in the Madras Presidency and the Darjeeling district of Bengal, the acreage in the two presidencies in 1913-14 being 2,452 and 2,200, respectively. The corresponding figures for 1921-22 were 3,410 and 3,100 acres. There is also a small area of 13 acres devoted to the plant in Mysore. *Cinchona ledgeriana* is the species mainly cultivated in Bengal, while *officinalis* is more frequently grown in Southern India. The whole of the cinchona plantations in Northern India belong to Government, while in Southern India all but 800 acres are in private ownership.

The plant is generally raised from seeds and infrequently from cuttings or layering. The first crop is usually obtained between the third and fifth year after planting by thinning out the plantation, when about 25 per cent of the trees are uprooted and barked. Proper bark harvesting however does not begin until at least ten years after planting.

**Method of marketing.** Harvesting is conducted in one of two ways, either by (1) lopping off branches or uprooting trees, and removing the bark from root-stem and branches, or by (2) coppicing.

The bark collected in whatever form is either exported or bought by Government. The chief products of the two Government factories at Neduvattam near Ootacamund in the Nilgiris, and at Mungpoo in the Darjeeling district are sulphate of quinine, and cinchona febrifuge. These factories meet to some extent the large internal demand for quinine from malarial stricken areas in India. Sulphate of quinine manufactured in India is now on sale at Post Offices all over the country. In Southern India it is sold in the form of powder in packets, while in Northern India it is distributed in tablet form, containing 20 four-grain tablets put up in small glass tubes.

Extension of the area under cinchona is necessary in order to make the British Empire independent of Java and other foreign sources of supply, and an officer was placed on special duty a few years ago to tour all over India and suggest suitable localities for new plantations.

Exports of the bark which are confined to the United Kingdom averaged about 600,000 lbs. annually valued at £10,000 before the war. Bengal has no exportable surplus and

**Exports.** all the shipments are from Southern India, the principal ports concerned being Tuticorin (55 per cent), Calicut (41 per cent) and Cochin (4 per cent). Exports, chiefly in the form of bark, are sold at a price calculated on the percentage of quinine sulphate contained in each lb., the unit being 1 per cent. Shipment is usually made in bales of 2 cwts. from Tuticorin and of 250 to 300 lbs. from Calicut. In 1917-18 and 1918-19 and again in 1922-23 nearly all the bark from private estates was taken over by the Madras Government for quinine extraction at Neduvattam.

TABLE No. 240.—Exports of cinchona bark from British India in 1913-14 and from 1918-19 onwards.

Year.	Quantity.	Value.
	Lbs.	£
1913-14 . . . . .	605,102	8,289
1918-19 . . . . .	27,468	706
1919-20 . . . . .	198,506	5,503
1920-21 . . . . .	328,172	12,785
1921-22 . . . . .	233,185	6,957
1922-23 . . . . .	10,080	552

Imports into India are chiefly in the form of quinine and its salts. The total quantity in 1922-23 amounted to 79,906 lbs. in addition to 299 lbs. of bark. Though a good deal came

**Imports.** from the United Kingdom and the United States of America, the countries of manufacture, the country of origin of most of these imports was undoubtedly Java.

### SUGAR.

India was probably the original home of sugarcane and the area under sugar is larger than in any country in the world. But the average yield per acre is so low, and the demand from a population that is largely vegetarian so great

**Production.** that the country depends to an increasing extent upon imports of cheap foreign sugar, which are subject to an import duty of 25 per cent. India's apathy in fact has proved Java's opportunity. Until 1906-07 the majority of these imports were of German and Austrian beet sugar; but, though the world prices for sugar continued to be regulated until the outbreak of war by the price of 88 per cent Hamburg, cane sugar gradually secured the bulk of the Indian trade and imports of sugar into India in 1913-14 were almost entirely from Java and Mauritius, the figures being 670,330 tons from Java and 142,395 tons from Mauritius out of a total of 899,370 tons. The area under sugar in India in that year was only 2,536,900 acres representing a decline of 8 per cent on the totals for 1890-91, but the large purchases by the United Kingdom of Mauritius and Java sugar and the apprehended shortage of foreign supplies and rise in values while war lasted made cultivation more remunerative and in 1918-19 a recovery had been made to the acreage of thirty years ago and the area under sugar was 2,901,000 acres. In 1922-23 the area was 2,740,000 acres, and the estimated area for 1923-24, 2,882,000 acres.

India's production of *gur* (unrefined sugar), including palm sugar, in the season 1921-22 amounted to 2,532,500 tons, which became available for consumption in 1922-23. In addition

**Consumption.** to this, some thirty-one modern refineries produced 77,600 tons of refined sugar, and another 40,000 tons, it is calculated, were manufactured by indigenous processes. To supplement these altogether inadequate supplies no less than 442,400 tons were imported, chiefly from Java, the total arrivals of beet sugar amounting to no more than 16,000 tons.

Re-exports of foreign refined sugar by sea amounted to 62,960 tons, and of indigenous manufactures 456 tons. There were also 3,500 tons of unrefined Indian sugar exported by sea, and by land 6,668 tons of refined. The position as regards refined sugar is summarized in the following table.\*

TABLE No. 241.—*Estimated consumption of refined sugar in India in 1922-23.*

Stocks as on 1st April 1922 . . . . .		Tons.
Production in India . . . . .		94,000
Imports by sea . . . . .		117,600
Imports by land . . . . .		442,400
		2
	TOTAL . . . . .	654,002
<i>Deduct—</i>		
Re-exports by sea of foreign sugar . . . . .		62,962
Exports by land of refined sugar . . . . .		6,668
Exports by sea of Indian sugar . . . . .		456
Stocks as on 1st April 1923 . . . . .		68,500
	TOTAL . . . . .	138,586
Balance available for consumption . . . . .		515,400
		in round figures.

The exports of Indian sugar are chiefly in the form of crude molasses or *gūr* for which there was formerly a considerable demand from Ceylon, and the Straits Settlements and Fiji for the Indian population

there who prefer this adulterated product to commercial sugar. The trade is in the hands of Indian merchants and the principal ports of export are Vizagapatam, Cocanada, Tuticorin and Bombay. The unit of sale in Bombay is the cwt. In Cocanada and Vizagapatam sales are made on the candy of 500 lbs. and in Tuticorin on the *tulam* of 20½ lbs., while shipment is usually effected from South Indian ports in bags of 1½ or 2 cwts. nett.

Of the reduced shipments in 1922-23, 60,000 tons were from Madras ports, chiefly to Ceylon and Arabia, including over 30,000 tons of palmira (palm) jaggery.

TABLE No. 242.—*Exports of sugar, quantity and value, in 1913-14 and during the last five years.*

Year.	Quantity.	Value.
	Cwts.	£
1913-14 . . . . .	191,930	91,649
1918-19 . . . . .	241,033	323,245
1919-20 . . . . .	328,980	359,453
1920-21 . . . . .	443,320	636,533
1921-22 . . . . .	124,020	165,779
1922-23 . . . . .	70,420	69,923

\* *Vide* Review of the Sugar Trade in India in 1922-23 by Wynne Sayer, Secretary, Sugar Bureau.

## GUTS AND CASINGS

Though it has to contend with many difficulties the Indian export trade in guts and casings is of some importance. The term *casings*

**Production.** is, generally speaking, confined to the viscera of cattle, while the viscera of sheep and goats are called *guts*, though the guts of certain sheep are sold salted as casings, as, for example, those of the fat tailed Delhi rams. There is little or no internal demand for casings but it has been calculated that the average exports do not represent more than the viscera of one million animals; while from 10 to 12 million cattle hides, raw or partially tanned, are annually exported. The chief reason for this difference is the difficulty of working up in the tropics a market for viscera except in cities of considerable size where the meat trade is centred in slaughter houses. *Beparis* may profitably collect the hides of single animals from village butchers or even the hides of cattle which have died a natural death, but deterioration sets in very quickly if casings are not treated immediately after the animal is disembowelled. Climatic conditions for a great part of the year also affect casings more prejudicially than hides. In view of all these considerations it is doubtful whether the volume of trade is capable of much expansion though considerable improvements might be effected in the methods of marketing. Casings are exported either dried or wet salted, but on account of the higher freight charged the bulk of the shipments are dried.

Casings are usually purchased direct from the slaughter houses and treated without delay on adjacent premises. After the fat has been

**Preparation for market.** carefully cut off they are turned inside out, scraped clean with a wooden scraper and well washed. One of the open ends is then tied and each gut is blown, and when the other end has been tied is sun-dried. When dry they are deflated, bound up in bundles of 100 *klasters*\* or 200 yards, packed in cases and pressed. A half case usually contains about 10,000 yards and a full case about 20,000 yards. The process is the same in the case of salted casings up to the point of inflation: in lieu of inflation the casings are sorted and packed in casks known as *tierces* in brine. The casks generally used in India are about 40 gallons in capacity and 2½ to 3 tierces go to the ton. Before packing, dry casings are sorted according to the measurement in millimetres of half the circumference, while in the case of salted casings the diameter is measured.

**Trade varieties.** Five different varieties of casings are recognised, namely—

- (1) *Runners*, the main gut 20 or 30 yards long in whorls open at both ends;
- (2) *Middles*, a straight gut with a maximum length of about 4 yards open at both ends;
- (3) *Bungs*, a curved gut with a maximum length of about one yard with a bulbous closed end. The bung skin from which gold beaters' skin is obtained is a tissue which is removable from either side of this bulbous end;

\* One *klaster* = 1.80 metres or roughly 2 yards.

- (4) *Bladders* used chiefly to cover cheese; and  
 (5) *Throats* (known in England as *weasands*) about one to three feet in length.

The preparation of bladders is impossible during the rains and they are at other times particularly subject to damage from insects.

In the following table are shown the exports of casings from Calcutta to each foreign country from 1919-20 onwards. Previous to March 1917 no separate figures for casings were maintained.

**Exports of casings.** Indian casings have a fair reputation in the world's market but were not considered in pre-war days so good as those from Southern Russia.

TABLE No. 243.—Quantity and value of casings exported from Calcutta from 1919-20 onwards.

Countries.	1919-20		1920-21		1921-22		1922-23	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Cwts.	£	Cwts.	£	Cwts.	£	Cwts.	£
Belgium . . . . .	..	..	381	822	511	1,010	200	588
Germany . . . . .	..	..	29	238	..	..	91	288
United Kingdom . . . . .	9	100	..	..	1	87	..	..
France . . . . .	458	2,537	647	3,745	119	751	401	4,308
Spain . . . . .	388	4,767	458	5,542	279	4,762	687	4,997
Switzerland . . . . .	..	..	98	269	..	..	..	..
United States of America . . . . .	9	100	..	..	..	..	..	..
<b>TOTAL</b>	<b>807</b>	<b>7,504</b>	<b>1,868</b>	<b>10,614</b>	<b>910</b>	<b>6,560</b>	<b>1,869</b>	<b>10,241</b>

Indian sheep and goat guts are generally of inferior quality. They are usually dried, packed in bundles of one or two lbs. each and shipped in cases containing from 150 to 200 lbs. No standard size is recognised: they are sorted according to colour and are shipped both split and unsplit.

In the table below are shown the exports of guts from Calcutta to each foreign country from April 1919 to March 1923.

**Exports of guts.**

The total for 1919-20 was swelled by unusually large clearance shipments of very inferior quality to Japan. The price per cent of guts, which was in the neighbourhood of £5 during the war, has now risen to over £20 per cwt.

TABLE No. 244.—Quantity and value of exports of guts from Calcutta from 1919-20 onwards.

Countries.	1919-20		1920-21		1921-22		1922-23	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Cwts.	£	Cwts.	£	Cwts.	£	Cwts.	£
Italy . . . . .	..	..	..	..	1	8	2	27
Germany . . . . .	..	..	121	2,989	118	718	215	4,584
Spain . . . . .	60	800	23	122	23	1,578	126	2,712
Belgium . . . . .	..	..	..	..	..	158	6	84
United Kingdom . . . . .	18	78	18	60	1	71	28	440
France . . . . .	697	1,100	68	902	96	1,788	44	1,638
Switzerland . . . . .	14	74	..	..	..	..	..	..
Japan . . . . .	1,180	478	..	..	..	..	..	..
<b>TOTAL</b>	<b>1,834</b>	<b>2,525</b>	<b>285</b>	<b>4,078</b>	<b>271</b>	<b>4,558</b>	<b>421</b>	<b>9,438</b>

The principal centres in the export trade are Calcutta, Bombay and Madras.

## TURPENTINE.

The turpentine industry in India had only just passed the experimental stage when war broke out, and the reduction in direct imports of American turpentine and *via* the United Kingdom gave it an impetus which, it is hoped, will have lasting results. Even now the distillation of crude resin derived from *pinus longifolia*, which abounds in the Himalayas, is confined to two factories owned by Government, one at Jallo in the Punjab and the other at Bareilly in the United Provinces, the factory at Bhowali having been closed. That there is an enormous scope for the development of the industry is evidenced by the estimated area under *pinus longifolia* under Government-owned forests which is put at about 400,000 acres, while the acreage under Indian States can be scarcely less. Other species of resin-yielding pines are also available in the Himalayas, in the Assam Hills and in Burma, and there is no reason why the ultimate annual production of Indian turpentine should not exceed 1½ million gallons and of rosin (colophony) 400,000 cwts. The present output at Jallo is about 19,000 cwts. of rosin and 70,000 gallons of turpentine, which represents almost the maximum capacity of the factory, while the capacity of the new factory at Bareilly will be 88,000 cwts. of crude oleo-resin, yielding 59,000 cwts. of rosin and 240,000 gallons of turpentine. The tapping season for the pines extends from March to November, the yield being about a cwt. of crude resin per acre which yields at Jallo 70 per cent by weight of rosin and 3 gallons of turpentine oil. The chief constituents of resin are rosin and turpentine oil, which must be separated from each other by steam distillation. Turpentine is sold in three qualities through agents at Calcutta, Bombay and Karachi working on a commission basis. There is a large demand for turpentine in the patent varnish trades and also in medicine, while rosin is used for shellac adulteration, in paper mills, soap factories and in the production of cheap varnishes.

The following table shews the production of rosin and turpentine  
Production. in India from 1911-12 onwards.

TABLE No. 245.—Quantity of rosin and turpentine produced in India from 1911-12.

Year.	Rosin.	Turpentine.
	Cwts.	Gallons.
1911-12 . . . . .	9,040	27,756
1912-13 . . . . .	20,544	60,249
1913-14 . . . . .	20,152	58,803
1914-15 . . . . .	24,878	78,489
1915-16 . . . . .	34,640	111,835
1916-17 . . . . .	43,732	125,963
1917-18 . . . . .	44,771	136,052
1918-19 . . . . .	47,993	153,837
1919-20 . . . . .	46,853	148,690
1920-21 . . . . .	54,542	157,388
1921-22 . . . . .	57,435	163,151

In 1907-08, 76,525 cwts. of rosin were imported : and in 1917-18 31,496 cwts. equivalent to about two-thirds of the Indian output in those twelve months. The imports in 1922-23

Imports of rosin and turpentine. aggregated 19,903 cwts. only, and the volume of exports was remarkably heavy, amounting to 34,556 cwts. as compared with an average of 3,000 cwts. in the previous quinquennium. In 1907-08, 333,500 gallons of turpentine were imported and in 1913-14, 193,937. In 1915-16 and 1916-17, the figures were 86,700 and 80,000 respectively which is considerably less than the Indian output, and in 1917-18 under 50,000. The figure for 1918-19 was 65,000 gallons and for 1922-23, 90,000 gallons.

### PEARLS.

The only pearl and chank fisheries of any importance in India are in the extreme south and in the Mergui archipelago. No pearl fishery has been conducted in the Gulf of Manaar since 1908, but everything points to a successful fishery being held in 1925 or 1926. The conch or chank shells (*turbinella pirum*) which are obtainable in the Ramnad and Tinnevely districts of the Madras Presidency go chiefly to Bengal to be made into bracelets, armlets and charms, the headquarters of the industry being Dacca. The imports of pearls, chiefly from the Bahrein islands and Maskat, into Bombay exceed £500,000 annually. They escaped separate registration until 1922-23 as they are usually despatched by insured letter mail. The aggregate value of pearls unset imported in 1922-23 was £640,000. Exports of pearls were absolutely prohibited for financial reasons in 1918; but this embargo was lifted within a few months of the armistice. The value of pearls exported from Bombay in a good year may exceed £1,000,000. There is a brisk, if not very valuable, trade in Mergui in mother-of-pearl and mussel shells, the value of which in 1917-18 and 1918-19 was £7,000 and £10,000, respectively, while the total value of pearls which passed through the Custom House at Mergui between the years 1912-13 and 1916-17 exceeded £17,000. ]

### PRECIOUS STONES.

India was known to the Romans for its beryls, and in later times the diamond mines of Golconda (Hyderabad) are believed to have produced the Koh-i-noor, but latterly the only precious stones mined in any quantity have been rubies, sapphires and spinels at Mogok in Upper Burma. The output of these mines in 1922 was valued at over £46,000, including one 23 carat ruby. The smaller and inferior stones are generally sold locally while the larger and better are despatched to London. The pigeon blood ruby of Mogok is considered superior to any other in the world. There are some aquamarines found in Sind and the Punjab, sapphires in Kashmir, and jadeite (for which there was formerly a good market in China) in Burma.

## PART IX

### MISCELLANEOUS

#### Coinage.

The units of Indian coinage are the pie, the pice (three pies), the anna of four pice and the rupee of sixteen annas. When the exchange value of the rupee is one shilling and four pence, the anna corresponds exactly to the English penny. The weight and fineness of silver coins and the weight of the cupro-nickel and bronze coins minted are shewn in the table below.

TABLE NO. 246.—*The weight and fineness of silver, cupro-nickel and bronze coins minted in India.*

SILVER COINS.				CUPRO-NICKEL COINS.		BRONZE COINS.	
Denomination.	Fine silver. Grains.	Alloy. Grains.	Standard weight. Grains.	Denomination.	Standard weight. Grains.	Denomination.	Standard weight. Grains.
Rupee . . . . .	165	13	180	8 anna coin . . . . .	120	Pice . . . . .	75
Half-rupee . . . . .	82½	7½	90	4 " " " . . . . .	105	Half-pice . . . . .	37½
Quarter-rupee or four-anna piece.	41¼	3¾	45	2 " " " . . . . .	90	Pie . . . . .	25
Eighth of a rupee or 2-anna piece.	20½	1¾	22½	1 " " " . . . . .	60		

The four-anna and one-anna nickel coins have scalloped edges with 8 and 12 scallops, respectively. The two-anna nickel is a square coin with rounded corners. The silver ½ rupee and the 8-anna nickel coin are being gradually withdrawn from circulation and no more of these coins will be minted.

One hundred thousand rupees are known as a *lakh* of rupees and a hundred lakhs as a *crore*.

By Act 22 of 1899 gold coins, sovereigns and half sovereigns were legal tender on payment of account at Rs. 15 for each sovereign, but as the result of the recommendations of the Babington Smith Committee this ratio was in 1920 reduced to Rs. 10. Since 1893 the Indian mints have been closed to unrestricted coinage for the public. The branch of the Royal Mint established at Bombay in 1918 for the coinage of sovereigns was closed down in April 1919. Prior to the opening of this branch of the Royal Mint a number of 15 rupee gold *mohurs* (originally a Moghal Coin) were minted at Bombay, the weight and fineness of these being the same as of sovereigns.

The denominations of currency notes in circulation are Rs. 1, 2½, 5, 10, 50, 100, 500, 1,000 and 10,000.

### Weights and Measures.

Weights and measures in India vary not only from district to district but also for different commodities within the same district, and though the railways have given a lead to the adoption of a uniform system, the country is so vast that the differences are likely to persist for many years to come. The principal units in all the scales of weights are the maund, seer and the tola, and the standard weights for each of these are 82.28 lbs., 2.057 lbs. and 180 grains troy. The tola is the same weight as the rupee. In addition to these weights, there is the viss of 3.60 lbs. or 140 tolas and the candy of 500 to 840 lbs. It is not necessary for the purposes of this volume to detail any variations of the weight of the maund, except those which enter into the export trade. It will be sufficient to say that in any particular city there are probably as many different maunds as there are articles to weigh. The only varieties which need be considered in connection with the foreign trade are the Bengal or railway maund already specified, the factory maund of 74 lbs. 10 ozs. 11 drs., the Bombay maund of 28 lbs. and the Madras maund of 25 lbs. In October 1913 the Government of India appointed a Committee to inquire into the whole question, and their majority report, which was presented in the following year, recommended the extension of the railway system based on the 180 grains tola, while the minority report advocated the adoption of the metric system. The views of the Provincial Governments on these reports were obtained and the Government of India in their Resolution dated the 3rd January 1922 declared themselves in favour of the ultimate adoption in India, excluding Burma, of a uniform system of weights based on the scale now in use on the Railways. It has been decided that no new measures prescribing all-India measures of weight or capacity should be introduced at present but that the Local Governments should take such executive action as they can to educate public opinion in favour of the standard maund and seer.

In the table below an attempt has been made to present within a small compass the principal weights and measures employed in the Indian export trade.

TABLE NO. 247.—Principal weights and measures in use in the export trade.

Name of unit.	British Imperial Value.	Commodities.
<b>GENERAL</b>		
Tola . . . . .	180 grains troy.	
Seer (Standard or Railway or Indian) . . . . .	2.057 lbs.	
Seer (Factory) . . . . .	1 lb. 13.5 oz.	
Viss . . . . .	3.60 lbs.	
Maund (Standard or 40 seers Railway or Indian) . . . . .	82 lbs. 4 oz. 9 dr.	
Maund (Factory) . . . . .	74 lbs. 10 oz. 11 dr.	

TABLE NO. 247.—Principal weights and measures in use in the export trade—contd.

Name of unit.	British Imperial Value.	Commodities.
LOCAL VARIATIONS.		
<i>Calcutta.</i>		
Seer . . . . . 80 tolas	2-053 lbs.	
Bazaar Maund . . . . .	82 lbs. 2 oz. 2 dr.	
<i>Bombay.</i>		
Seer . . . . . 27 tolas 40 grains.	11½ oz.	
Maund . . . . . 40 seers	28 lbs. (¼ cwt.)	
Maund (Surti) . . . . .	39-2 lbs. (also 29-4, 38-26 and 41-06)	Cardamoms.
	11 Bombay maunds=308 lbs.	Coriander seed.
	20 Bombay maunds=560 lbs.	Groundnut, sesame, castorseed, tobacco (unmanufactured).
	21 Bombay maunds=588 lbs.	Raw wool, turmeric, pepper, chillies.
Candy . . . . .	22½ Bombay maunds=630 lbs.	Mustard seed.
	25 Bombay maunds=700 lbs.	Myrobalans.
	27 Bombay maunds=756 lbs.	Wheat, barley, jowar, bajra, gram.
	28 Bombay maunds=784 lbs.	Raw cotton, pulse, cotton seed.
	29½ Bombay maunds=823 lbs.	Nux vomica.
<i>Karachi.</i>		
Seer . . . . . 80 tolas	2-05 lbs.	
	28 lbs.	Hides, raw.
	824* lbs.	Oilseeds.
Maund . . . . .	84 lbs.	Wool.
	86-40	Bone manures.
Candy . . . . .	8 Maunds=656 lbs. (of 82 lbs.)	Rice, barley, sesame, wheat.
<i>Madras.</i>		
Maund . . . . .	25 lbs.	Indigo.
Candy . . . . .	500 lbs.	Raw cotton.
Candy (Dutch) . . . . .	672 lbs.	Copra.
<i>Tuticorin.</i>		
Tulam . . . . .	14 lbs.	Groundnut cake.
	15 lbs.	Chillies.
	20½ lbs.	Suzar.
Maund . . . . .	26 lbs.	Coffee.
Candy . . . . .	500 lbs.	Raw cotton.
<i>Negapatam.</i>		
Seer . . . . . 24 tolas or 8 palams	9½ oz.	Chillies, ginger, etc.
<i>Cocanada.</i>		
Maund . . . . .	25 lbs.	Turmeric.
Candy . . . . .	500 lbs.	Raw cotton.
<i>Cuddalore.</i>		
Candy (French) . . . . .	530 lbs.	Groundnut.

\* In practice the fraction is often neglected.

TABLE NO. 247.—Principal weights and measures in use in the export trade—conold.

Name of unit.	British Imperial value.	Commodities.
<i>Cochin.</i>		
Candy	600 lbs.	Copra, etc.
<i>Mangalore.</i>		
Seer . . . . . 24 tolas	9½ oz.	Sandalwood oil.
Maund . . . . .	28 lbs.	Coconut oil.
Candy . . . . .	32 lbs.	Copra.
	560 lbs.	Sandalwood.

**Freights.**

The following statement shews the rate per ton for London, current at the several ports named, during that month of the year in which shipments of the stated article of produce are usually the heaviest.

TABLE NO. 248.—Rates of freight per ton for certain articles from India to the United Kingdom in 1914 and from 1918 onwards.

Ports, articles and destinations.	1914.	1918.	1919.	1920.	1921.	1922.	1923.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
<i>Calcutta.</i>							
Linseed to London or Liverpool. [June]	0 17 6	( <i>d</i> ) 8 16 0	( <i>d</i> ) 6 0 0	( <i>d</i> ) 6 0 0	( <i>d</i> ) 2 5 0	( <i>d</i> ) 2 0 0	( <i>d</i> ) 1 15 0
Tea to London [August]	1 15 0	( <i>a</i> ) 6 5 0 (per ton of 30 c. lt.)	( <i>d</i> ) 6 0 0	( <i>d</i> ) 7 11 3	( <i>d</i> ) 2 15 0	( <i>d</i> ) 2 7 6	( <i>d</i> ) 2 7 6
Jute to London [October]	2 3 0	( <i>b</i> ) 20 0 0	( <i>d</i> ) 7 10 0	( <i>d</i> ) 6 0 0	( <i>d</i> ) 2 15 0	( <i>d</i> ) 1 12 6	( <i>d</i> ) 1 17 6
<i>Bombay.</i>							
Cotton to Liverpool [January]	0 15 6	16 5 0	10 15 0	4 10 0	1 15 0	0 17 6	1 1 6
Seeds to London [December]	0 17 6	No quotation.	4 5 0	2 10 0	1 0 0	1 4 0	1 0 0
<i>Karachi.</i>							
Wheat to Liverpool [May]	0 12 6	12 10 0	4 10 0	4 9 0	1 2 6	0 10 6	1 6 3
<i>Madrass.</i>							
Hides and Skins to London. [October]	2 8 0	( <i>c</i> ) 5 5 0	7 15 0	5 15 0	4 10 0	2 15 0	2 15 0
Groundnuts to Marseilles. [January]	1 7 6	No shipment.	No quotation.	8 5 0	3 5 0	1 0 0	1 12 6
<i>Rangoon.</i>							
Rice to London [February]	1 1 0	( <i>e</i> ) 6 5 0	( <i>h</i> ) 8 15 0	10 0 0	1 15 0	1 5 0	1 10 0

- (a) Subject to a rebate of 5 shillings.
- (b) Inclusive of 25 per cent surtax.
- (c) Tanned hides per ton of 40 c. lt., shipped on behalf of War Office.
- (d) Rate fixed by Ministry of Shipping as only Government abnments allowed.
- (e) Controlled rate for Government purchases only.
- (f) Less 5 per cent.
- (g) Subject to a rebate of 10 per cent not exceeding 6s. per ton.
- (h) Special rate for the wheat commission.

## APPENDICES.

- I. Tonnage Schedules.
- II. Merchandise Marks Law.
- III. Principal Railways in India.
- IV. Concessions to Commercial Travellers.
- V. Crop Forecasts.
- VI. Glossary of Indian terms.
- VII. East Indian Wheat Contract.
- VIII. East Indian Linseed Contract.

APPENDIX I.

TONNAGE SCHEDULES FOR STEAMERS.

*For the ports of Calcutta, Bombay, Madras and Karachi.*

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Aloes . . . . .	..	In kegs, 40 c. ft.	In bags, 20 cwt. In cases, 50 c. ft.	In kegs, 40 c. ft.
Alum . . . . .	..	In bags, 16 cwt.	20 cwt.	In bags, 16 cwt.
Aniseed . . . . .	In bags, 8 cwt.	..	..	..
Anatto . . . . .	..	In C/S, 40 c. ft.	..	In C/S, 40c.ft.
Apparel . . . . .	..	40 c. ft.	50 c. ft.	Do.
Arrowroot . . . . .	..	In C/S, 40 c. ft.	In C/S, 50 c. ft.	Do.
Assafetida . . . . .	..	In C/S, 40 c. ft.	In bags, 20 cwt. In cases, 50 c.ft.	In C/S, 40 c. ft.
Bajree . . . . .	..	In bags, 18 cwt.	..	In bags, 18 cwt.
Barilla . . . . .	..	16 cwt.	..	16 cwt.
Bark . . . . .	..	..	In bags, and bundles, 8 cwt.	..
Barley, . . . . .	20 cwt.	In bags, 15 cwt.	..	In bags, 15 cwt.
Beans . . . . .	..	..	..	..
Beeswax . . . . .	20 cwt.	In C/S, 40 c. ft.	20 cwt.	In bags, 40 c. ft.
Betelnuts . . . . .	20 cwt.	In bags, 18 cwt.	18 cwt.	In bags, 18 cwt.
Blackwood . . . . .	..	In straight square logs, 40 c. ft.	..	In straight square logs 40 c. ft.
Bonemeal, etc. . . . .	20 cwt.	Meal and dust, 20 cwt.	20 cwt.	Meal and dust 20 cwt.
		Meal in bags (in accordance with the average quality of which a stand- ard is pre- scribed by the Chamber), 20 cwt.	..	Crushed in bags as per stand- ards kept by the Chamber, (Note 4 on p. 349), 17 cwt., 15 cwt. and 18 cwt.
Bones . . . . .	Crushed 20 cwt. or 50 c. ft. (at steamer's op- tion).	Crushed in bags as per the Chamber standard.	Bone Shaws, in bales, 50 c. ft.	Loose, 8 cwt. (See note 4 on p. 349.)
		A 11 cwt.	..	..
		B 14 cwt.	..	..
		C 17 cwt.	..	..
		(See note 2 on p. 349.)		

TONNAGE SCHEDULES FOR STEAMERS—*contd.*

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Books . . . . .	..	40 c. ft.	50 c. ft.	40 c. ft.
Borax . . . . . (or Tincal).	20 cwt.	In C/S, 40 c. ft. In bags, 16 cwt.	In bags, 20 cwt. In C/S, 50 c. ft.	In C/S, 40 c. ft. In bags, 16 cwt.
Bran . . . . .	14 cwt.	In bags, pressed, 10 cwt. (See note 2 on p. 349.)  In bags, unpressed, 9 cwt.	..	In bags, pressed (See note 4 on p. 349), 10 cwt.  Unpressed, in bags, 9 cwt.
Brimstone . . . . .	..	..	20 cwt.	..
Bristles . . . . .	50 c. ft.	..	..	..
Buffalo horns (See horns)	..	In bundles, 6 cwt.	..	In bundles, 6 cwt.
Bullion . . . . .	<i>Ad valorem.</i>	At per cent.	<i>Ad valorem.</i>	At per cent.
Camphor . . . . .	In C/S, 50 c. ft.	In C/S, 40 c. ft.	In C/S, 50 c. ft.	In C/S, 40 c. ft.
Cane or rattans (See also Rattans).	Rattans for dunn a g e, 20 cwt. or 50 cft. (at steamer's option)	In bundles, 13 cwt.	..	In bundles, 13 cwt.
Carbonate of Potash . . . . .	50 c. ft.	..	..	..
Cardamoms . . . . .	In robbins, 8 cwt.  In boxes, 50 c. ft.	In bundles, 40 c. ft.	..  In cases, 50 c. ft. In bags, 10 cwt.	In bundles, 40 c. ft.
Carpets . . . . .	60 c. ft.	..	60 c. ft.	..
Cassia . . . . .	In boxes, 12 cwt.	Cassia, lignea, fistula and buds, 40 c. ft.	In cases, 50 c. ft. In bags, 12 cwt.	Cassia, Lignea, Fistula and buds, 40 c. ft.
Castor seed . . . . .	15 cwt.	<i>Bold Cauwpoore</i> description and mixture containing more than 2 per cent of such, 10 cwt. Other sorts not containing more than 2 per cent of <i>Bold Cauwpoore</i> description 13 cwt. (12 cwt. with effect from 1st Oct. '24.) 8 cwt.	20 cwt.	14 cwt.
Chasam . . . . .	60 c. ft.	..	..	8 cwt.

TONNAGE SCHEDULES FOR STEAMERS—*contd.*

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Chillies . . . . .	(Dry) in bags, or bundles, 8 cwt.	..	In bags, 12 cwt. In robbins, 14 cwt.	..
Chinaroot . . . . .	..	In C/S, 40 c. ft.	In bags, 11 cwt.	In C/S, 40 c. ft.
Chiretta . . . . .	In bundles, 50 c. ft.	..	In cases, 50 c. ft.	..
Chrome ore. . . . .	20 cwt.	..	In bales, 50 c. ft.	..
Cigars . . . . .	..	40 c. ft.	50 c. ft.	40 c. ft.
Cinnamon . . . . .	..	In C/S, 40 c. ft.	..	In C/S, 40 c. ft.
Cloves . . . . .	In bags, 8 cwt.	In C/S, 40 c. ft.	In bags, 8 cwt.	In C/S, 40 c. ft.
	In cases, 50 c. ft.	In bags or frails, 8 cwt.	In cases, 50 c. ft.	In bags or frails, 8 cwt.
Coal . . . . .	20 cwt.	..	20 cwt.	20 cwt.
Cochineal . . . . .	50 c. ft.	..	50 c. ft.	..
Cocoa . . . . .	..	In bags, 10 cwt.	..	In bags, 10 cwt.
Coconut oil (See oil). . . . .	..	11 cwt.	..	11 cwt.
Coculus Indicus . . . . .	..	In bags, 18 cwt.	..	In bags, 18 cwt.
Coffee . . . . .	In bags, 18 cwt.	In C/S, 40 c. ft.	In bags, 18 cwt.	In C/S, 40 c. ft.
	..	In bags or frails, 14 cwt.	In C/S, 17 cwt.	In bags or frails, 12 cwt.
Coir . . . . .	In dholls, 10 cwt.	In bales, 40 c. ft.	Yarn and fibre, 12 bales, 50 c. ft.	In bales, 40 c. ft.
	..	In bundles or loose, 5 cwt.	In bundles and dholls, 10 cwt.	In bundles or loose, 5 cwt.
Coir rope . . . . .	..	In coils, 40 c. ft.	..	In coils, 40 c. ft.
Coke . . . . .	20 cwt.	..	..	..
Colocyath . . . . .	..	In C/S, 40 c. ft.	..	In C/S, 40 c. ft.
Colombo root . . . . .	..	In bags, 8 cwt.	..	In bags, 8 cwt.
Copper ore . . . . .	20 cwt.	..	..	..
Copra or coconut kernel . . . . .	12 cwt.	In robbins, 8 cwt.	In bags, 12 cwt.	In robbins, 8 cwt.
	..	Cut copra in bags, 10 cwt.	..	Cut, in bags, 11 cwt.
Copra cake or Coconut cake . . . . .	20 cwt.	..	..	..
Coral . . . . .	..	Rough (not specimens) in bags, 18 cwt.	..	Rough (not specimens) in bags, 16 cwt.
Coriander seed. . . . .	12 cwt.	..	20 cwt.	..
Corandum ore . . . . .	20 cwt.	..	20 cwt.	..

TONNAGE SCHEDULES FOR STEAMERS—contd.

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Cotton	50 c. ft.	In bales, 40 c. ft.	In bales, 50 c. ft.	In bales, 40 c. ft.
Cottonseed	14 cwt.	13 cwt. (See note 2 on p. 349.)	20 cwt.	13 cwt.
Cotton in yarn	..	..	50 c. ft.	..
Cotton piece-goods	..	..	50 c. ft.	..
Cow and Goat Hair	..	..	In bales, 50 c. ft.	..
Cowries	20 cwt.	In C/S, 40 c. ft. In bags, 16 cwt.	20 cwt.	In C/S, 40 c. ft. In bags, 16 cwt.
Cubels	..	10 cwt.	..	10 cwt.
Curminseed	8 cwt.	In C/S, 40 c. ft. (In bags, 11 cwts. with effect from 1st Oct. '24.)	..	In C/S, 40 c. ft.
Cutch	In 18 cwt. bags, In C/S, 50 c. ft., not exceeding 20 cwt. gross	And gambier (terra japonica) in bags or baskets, unscrewed, 13 cwt.	In bags, 17 cwt.	And gambier (terra japonica) in bags or baskets, unscrewed 1 cwt.
Cylindrical packages, rolls, etc.	..	40 c. ft. (See note 2 on p. 349.)	..	40 c. ft. (See note 4 on p. 349.)
Dates	Wet, 20 cwt. Dry, 16 cwt.	Wet, 16 cwt. Dry, 13 cwt.	..	Wet, 16 cwt. Dry, 13 cwt.
Divi-divi	..	..	20 cwt.	..
Dhall	20 cwt.	Crushed in bags, 17 cwt.	20 cwt.	Crushed or split in bags, 17 cwt.
Dragon's blood	..	In C/S, 40 c. ft.	..	In C/S, 40 c. ft.
Ebony	..	Square and straight, 40 c. ft. Otherwise, 15 cwt.	..	Square and straight, 40 c. ft. Otherwise, 15 cwt.
Elephants' teeth	..	In C/S, 40 c. ft.	..	In C/S, 40 c. ft.
Fennel seed	..	In bundles, 14 cwt. Loose, 16 cwt.	In C/S, 50 c. ft.	In bundles, 14 cwt. Loose, 16 cwt.
Fenugreek (Methile seed)	..	10 cwt. 17 cwt.	.. 20 cwt.	10 cwt. 17 cwt.
Fibres, all sorts	50 c. ft.	..	Palmyra fibre, in bales 50 c. ft. In ballots or bundles, 10 cwt.	..
Fish manure	..	..	..	As per sample lodged with the Chamber, 9 cwt.

**TONNAGE SCHEDULES FOR STEAMERS—contd.**

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Fishmaws or Isinglass . . . . .	..	..	..	In C/S, 40 c. ft.
Flour . . . . .	..	In bags, 18 cwt.	..	18 cwt.
		Middlings or sharps in bags, 12 cwt.	..	Middlings or sharps in bags 12 cwt.
Furniture . . . . .	..	40 c. ft.	..	40 c. ft.
Galingals . . . . .	..	10 cwt.	..	10 cwt.
Galls . . . . .	..	In bags, 13 cwt.	..	In bags, 13 cwt.
Garlic or onions . . . . .	12 cwt.	In C/S, 40 c. ft.	..	In C/S, 40 c. ft.
Ghee (ghl) . . . . .	..	..	..	In dubbas or casks, 40 c. ft.
Ginger . . . . .	14 cwt.	Dry in C/S, 40 c. ft.	In bags 12 cwt.	Dry in C/S, 40 c. ft.
		Dry in bags, 10 cwt.	In C/S, 50 c. ft.	Dry in bags, 10 cwt.
Gram . . . . .	20 cwt.	In bags, 17 cwt.	20 cwt.	17 cwt.
Groundnuts . . . . .	..	Shelled, 13 cwt. (14 cwts. with effect from 1st Oct. '24.)	..	Shelled, 13 cwt.
		Unshelled, 6 cwt.	Kernels and Unshelled, 20 cwt.	Unshelled 6 cwt.
Gums . . . . .	In C/S, 50 c. ft.	Of all kinds in C/S, 40 c. ft.	In C/S 50 c. ft.	Of all kinds in C/S, 40 c. ft.
		Gum albanum in bags, 13 cwt.	In bags, 20 cwt.	Olibanum in bags, 13 cwt.
		Gum (Persian) in double bags and Gum (Arabic) in double bags, 17 cwt.		
Ganje . . . . .	50 c. ft.	..	50 c. ft.	..
Gunny bags and gunny cloth . . . . .	Gunnies, 50 c. ft. or 20 cwt. gross (at steamer's option).	..	In bales, 50 c. ft.	..
Hemp . . . . .	In bales, 50 c. ft.	In screwed bales, 40 c. ft.	In bales, 50 c. ft.	In screwed bales, 40 c. ft.
		Loose or in bundles, 5 cwt.	..	Loose or in bundles, 5 cwt.
Hides and Skins (See also Skins).	In bales, 50 c. ft.	Hides and skins in screwed bales, 40 c. ft.	Hides, 50 c. ft. tanned and dry.	In screwed bales, hides and skins, 40 c. ft.
		Hides and skins loose and in small bundles, 40 c. ft.	..	Hides and skins loose and in small bundles, 40 c. ft.
Hide cuttings . . . . .	In bales, 50 c. ft.	..	50 c. ft.	..

TONNAGE SCHEDULES FOR STEAMERS—*contd.*

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Hoofs, horns, etc.	Hoofs, cow and buffalo, Horns and Horn tips, loose, 20 cwt.  Ditto bags or bundles, 50 c. ft. Horns, deer, in bags or bundles, 50 c. ft.	Horns, buffalo and cow, loose, 18 cwt.  Horns, deer, loose, 6 cwt.  Horn tips, of any kind, 18 cwt.	Hoofs, horns shavings and tips, 20 cwt.  Horns, cow, buffalo and deer, 20 cwt.  .....  .....	Horns, buffalo and cow, loose 18 cwt.  Horns, deer loose, 6 cwt.  Horn tips of any kind and hoofs, 18 cwt.  Buffalo horns in bundles, 6 cwt.
Hurtall (Orpiment)	.....	In C/S, 40 c. ft.	.....	In C/S, 40 c. ft.
India Rubber	Rubber, in C/S, 50 c. ft.	.....	In C/S, 50 c. ft. Scrap in bags, 20 cwt.	..
Indigo	50 c. ft.	In C/S, 40 c. ft.	50 c. ft.	In C/S, 40 c. ft.
Iron (See Metals)	.....	Old, 20 cwt.  Rails, 20 cwt.  40 c. ft.	.....  .....  .....	Old or scrap, 20 cwt.  Or steel rails, 20 cwt. 40 c. ft.
Jackwood (See Timber)	.....	40 c. ft.	.....	40 c. ft.
Jamba (See Rapeseed).	.....	.....	.....	18 cwt.
Jaggery	.....	.....	.....	.....
Jowarree	.....	In bags, 18 cwt.	.....	In bags, 18 cwt.
Jute	50 c. ft.	.....	50 c. ft.	.....
Kapok	50 c. ft.	.....	.....	.....
Kapok seed.	14 cwt.	.....	.....	.....
Khorassan	.....	.....	.....	16 cwt.
Lac	Button, seed, stick and shellac, in bags, 16 cwt.  Button, seed, stick and shellac, in cases, 50 c. ft.  Kiri lac or lac refuse, in bags, 20 cwt.  Lac dye, in cases, 50 c. ft.	Lac dye in shells or C/S, 40 c. ft.  .....  .....  .....	Cake lac in bags, 16 cwt.  Lac dye, 50 c. ft.  Seed lac in C/S, 50 c. ft.  Seed lac in bags, 16 cwt.  Shellac in C/S, 50 c. ft.  Shellac in bags, 16 cwt.  Stick lac in C/S, 50 c. ft.  Stick lac in bags, 16 cwt.	Lac dye in shell or C/S, 40 c. ft.  Lac (seed) in bags, 18 cwt.  .....  .....  .....  .....

TONNAGE SCHEDULES FOR STEAMERS—*contd.*

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Lang (Vetch)	....	In bags, 18 cwt. Crushed in bags, 17 cwt.	....	In bags, 18 cwt. Crushed in bags, 17 cwt.
Lard	20 cwt..	....	50 c. ft.	....
Leather	In cases or bales, 50 c. ft.	....	In bales, 50 c. ft.	....
Lentils	20 cwt.	....	....	20 cwt.
Linseed	20 cwt.	In bags, 16 cwt.	20 cwt.	In bags, 16 cwt.
Mace	....	In C/S, 40 c. ft.	In C/S, 50 c. ft.	In C/S, 40 c. ft.
Machine <sup>y</sup>	..	....	20 cwt. or 50 c. ft. (at Steamer's opt'n.	....
Magnesite	....	....	In bulk or bags, 20 cwt.	....
Maize	20 cwt.	In bags, 16 cwt.	....	In bags, 17 cwt.
Manganese	20 cwt.	....	....	....
Metals (See Iron separate)	....	....	20 cwt.	....
Methis seed (vide Fenu- greek).	....	....	....	....
Mica (See Talc)	....	....	....	....
Molasses	20 cwt. gross	....	20 cwt.	....
Mother of pearl	In bags or cases, 20 cwt. gross.	In C/S, 40 c. ft. In bags, 16 cwt.	In bags, 20 cwt. In chests, 20 cwt.	In C/S, 40 c. ft. In bags, 16 cwt
Motor car	....	....	50 c. ft.	....
Mowra	Seed, 20 cwt.	Flowers, 18 cwt. Seed in bags, 18 cwt.	20 cwt.	Flowers, 18 cwt. Seed in bags, 18 cwt.
Nutter (Dhal).	....	....	....	18 cwt.
Munjeet (Dye).	Dye, in cases, 50 c. ft.	Or Madder root in C/S, or bales, 40 c. ft.  Or Madder root in bundles or bags, 8 cwt.	50 c. ft.  ....	Or Madder root in C/S or bales, 40 c. ft.  Or Madder root in bundles or bags, 8 cwt
Musk	....	In C/S, 40 c. ft.	....	In C/S, 40 c. ft.
Masur (Dhal).	....	In bags, 20 cwt. (10 cwt. with effect from 1st Oct. '24).	....	In bags, 20 cwt.
Mustard seed	20 cwt.	16 cwt.	20 cwt.	16 cwt.

**TONNAGE SCHEDULES FOR STEAMERS—contd.**

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Myrobalans . . . . .	Whole or crushed, 20 cwt.	In bags, 18 cwt. (14 cwt. with effect from 1st Oct. '24). Crushed in bags, 11 cwt. (See note 2 on p. 340). Powder, 15 cwt.	20 cwt.	In bags, 13 cwt.
Nigerseed . . . . .	20 cwt.	14 cwt.	20 cwt.	14 cwt.
Nutmegs . . . . .	In C/S, 50 c. ft.	In cases, 40 c. ft.	In cases, 50 c. ft.	In C/S, 40 c. ft.
Nux Vomica . . . . .	Seed, 16 cwt.	In cases, 40 c. ft.  In bags, 13 cwt.	20 cwt.  ....	In cases, 40 c. ft.  In bags, 13 cwt.
Oats . . . . .	16 cwt.	....	20 cwt.	....
Oil (See Coconut oil and cotton-seed oil separate).	In C/S, 50 c. ft.  In casks or drums, 50 c. ft.  Essential, ad valorem.	Of any kind in casks, 40 c. ft.  ....	In C/S, 20 cwt. or 50 c. ft. (at steamer's option).  In casks, 20 cwt. Essential, Ad valorem.	Of any kind in cases, 40 c. ft.  ....
Oilseed cake (See cotton-seed cake separate).	20 cwt.	Oil cake powder, 16 cwt. Oilcake, machine pressed, flat, except coconut 17 cwt. Oilcake, coconut (machine pressed, flat) of all shapes, 15 cwt. Oilcake in pieces (machine pressed), 12 cwt. Oilcake of all kinds (hand or bullock pressed), 12 cwt.	Poonac, 20 cwt.	Oilcake in casks or lumps (in bags), 16 cwt.
Olibanum (See Gum).				
Onions (See Garlic).				
Opium . . . . .	Per chest.	Per chest.	....	Per chest.
Ore of all descriptions . . . . .	....	....	20 cwt.	Loose or in bags 20 cwt.
Paddy . . . . .	16 cwt.	In bags, 13 cwt.	In bags, 20 cwt.	In bags, 13 cwt.
Palmyra fibre (See Coir and fibres of all sorts).				
Pean . . . . .	20 cwt.	(17 cwt. with effect from 1st Oct. '24).	20 cwt.	White, 18 cwt.
Pepper . . . . .	Long, 12 cwt. Black, 14 cwt.	In bags, 13 cwt.  ....	In bags, 13 cwt.  ....	In bags, 13 cwt.  ....

TONNAGE SCHEDULES FOR STEAMERS—*con'd.*

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Pig Iron and Pig Lead . . . . .	20 cwt.	....	....	....
Pimento . . . . .	....	12 cwt.	....	12 cwt.
Planks and deals . . . . .	....	....	50 c. ft.	....
Plumbago . . . . .	....	In bags, 16 cwt.	....	In bags, 16 cwt.
Pollards . . . . .	....	In bags, 10 cwt.	....	....
Poonac (See oil seed cakes also).	....	....	20 cwt.	....
Poppyseed . . . . .	20 cwt.	In bags (1½ cwt.) 14 cwt.  (12 cwt. with effect from 1st Oct. '24).  In double bags (1½ cwt.), 13 cwt.  In single bags (1½ cwt.), 14 cwt.  In double bags (1½ cwt.), 14 cwt.	20 cwt.	In double bags (1½ cwt.), 13 cwt.  In single bags (1½ cwt.), 14 cwt.  In bags, (1½ cwt.) 14 cwt.
Rails, Iron or steel (See Iron).				
Rapeseed . . . . .	20 cwt.	16 cwt.	20 cwt.	Rapeseed, Sita, Jamba and other kinds, 16 cwt.
Rattans (See Canes also) . . . . .	For dunnage, 20 cwt. or 50 c. ft. (at steamer's option).	In bundles, 13 cwt.  Ground, 13 cwt.	20 cwt.	In bundles, 18 cwt.  Ground, 18 cwt.
Redwood (Dye) . . . . .	For dunnage, 20 cwt. or 50 c. ft. (at steamer's option.)	13 cwt.	For dunnage, 20 cwt.	13 cwt.
Rhea . . . . .	....	....	In bales, 50 c. ft.	....
Rhubarb . . . . .	....	In C/S, 40 c. ft.	....	In cases, 40 c. ft.
Rice . . . . .	20 cwt.	In bags, 18 cwt.	In bags, 20 cwt.	In bags, 18 cwt.
Lopping (See Coir, etc.) . . . . .	Rope in coils or bundles, 50 c. ft.	....	In coils, 50 c. ft.	....
Rubber (see Indian Rubber)				
Lum . . . . .	....	....	In casks, 20 cwt.	....

**TONNAGE SCHEDULES FOR STEAMERS—*contd.***

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Safflower . . . . .	50 c. ft.	In C/S, 40 c. ft.	20 cwt.	In C/S, 40 c. ft.
		In screwed bales, 40 c. ft.	....	In screwed bales, 40 c. ft.
		In bags, 8 cwt.	....	In bags, 8 cwt.
Safflower seed (Kardi) . . . . .	....	Seed in 1 agt. 18 cwt.	....	18 cwt.
Sago . . . . .	....	In C/S, 40 c. ft.	In C/S, 50 c. ft. In bags, 20 cwt.	In C/S, 40 c. ft.
Sal ammoniac . . . . .	In bags or boxes, 20 cwt. gross.	In C/S, 40 c. ft.	....	In C/S, 40 c. ft.
		In bags, 15 cwt.	....	In bags, 15 cwt.
Salt . . . . .	20 cwt.	28 Indian mds. of 82½ lbs.	20 cwt.	28 Indian mds. of 82½ lbs.
Saltfish . . . . .	....	....	....	14 cwt.
Saltpetre . . . . .	20 cwt.	20 cwt.	20 cwt.	20 cwt.
Sandalwood . . . . .	....	9 cwt.	....	11 cwt.
		Roots and chips, 7 cwt.	....	....
Sapanwood (Dye) . . . . .	For dunnage, 20 cwt. or 50 c. ft. (at steamer's option).	9 cwt.	....	....
Sealing wax . . . . .	....	In C/S, 40 c. ft.	....	In C/S, 40 c. ft.
Senna . . . . .	In bales, 50 c. ft.	In bags, 5 cwt.	In bales, 50 c. ft.	In bags, 5 cwt.
		In bales, 40 c. ft.	....	In bales, 40 c. ft.
Sharks and fins . . . . .	....	....	16 cwt.	....
Shells . . . . .	....	Rough in bags, 16 cwt.	In bags, 20 cwt.	Rough in bags, 16 cwt.
Silk . . . . .	Raw in bales, 10 cwt. In cases or bales, 50 c. ft.	In bales, 8 cwt. In C/S, 40 c. ft.	Raw in bales, 50 c. ft. Piece goods and waste, 50 c. ft.	In bales, 8 cwt. In C/S, 40 c. ft.
	Waste, 50 c. ft. Chassis, 50 c. ft.			
	Piece goods, <i>Ad valorem</i> or 50 c. ft. (at steamer's option).			
Silver specie and/or valuable cargo.	<i>Ad valorem</i>	....	<i>Ad valorem.</i>	....
Sits oil seed (See Rapeseed).				
Skins (See Hides) . . . . .	In casks, 20 cwt. gross. In bales, 50 c. ft.	....	Tanned and dry 50 c. ft. Wet salted and pickled in casks, 50 c. ft.	Tanned skins in Pressed bales, 40 c. ft.

TONNAGE SCHEDULES FOR STEAMERS—*contd.*

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Soap . . . . .	In bags, 15 cwt. In cases, 50 c. ft.	In C/S, 40 c. ft.	Country, in C/S, 60 c. ft.	In C/S, 40 c. ft.
Sugar (See Jaggery). . . . .	20 cwt.	In double bags, 19 cwt.	Including Jaggery, in bags, 20 cwt.	In bags, 19 cwt.
Talc . . . . .	In cases, 20 cwt. gross.	16 cwt.	Minus Talc and splittings, in cases 50 c. ft.	16 cwt.
Tallow . . . . .	In C/S or casks, 20 cwt. gross.	40 c. ft.	Minus waste, in bags, 20 cwt.	40 c. ft.
Tamarini . . . . .	In cases or casks, 20 cwt. gross.	15 cwt.	In cases and casks, or bundles 20 cwt.	15 cwt.
Tapioca . . . . .	.....	.....	50 c. ft.	.....
Tea . . . . .	50 c. ft.  Waste, as broken stowage, 16 cwt.	In chests, 40 c. ft.	50 c. ft.	In chests, 40 c. ft.
Tilseed or Gingelly . . . . .	20 cwt.	15 cwt. (14 cwt. with effect from 1st Oct. '24).	20 cwt.	15 cwt.
Teak (See Timber). . . . .	.....	Square planks and poon, 40 c. ft.	.....	Teak square planks and poon, 40 c. ft.
Timber (See also Teak and Jack wood separate). . . . .	50 c. ft.	.....	20 cwt. or 50 c. ft. (at steamer's option).	.....
Tobacco . . . . .	In bales or cases, 50 c. ft.	In bales, 40 c. ft.	In bales, 50 c. ft.	In bales, 40 c. ft.
Tortoise shells (See shells). . . . .	.....	In chests, 40 c. ft.	In cases, 50 c. ft.	In chests, 40 c. ft.
Turmeric . . . . .	16 cwt.	In bags, 11 cwt.	In bags, 16 cwt.	In bags, 11 cwt.
Tutenague . . . . .	.....	16 cwt.	.....	16 cwt.
Twine . . . . .	In cases, 50 c. ft.	.....	.....	.....
Unrated wood . . . . .	.....	11 cwt.	.....	11 cwt.
Wax . . . . .	20 cwt.	.....	.....	.....
Weed seed . . . . .	.....	In bags, 10 cwt. (11 cwt. with effect from 1st Oct. '24).	.....	.....
Whanghees (side canes) . . . . .	.....	13 cwt.	.....	13 cwt.
Wheat . . . . .	20 cwt.	18 cwt.	.....	18 cwt.
Wines and spirits . . . . .	.....	In casks and in C/S, 40 c. ft.	.....	In casks and cases, 40 c. ft.

**TONNAGE SCHEDULES FOR STEAMERS—concl'd.**

Name of the article.	CALCUTTA.	BOMBAY.	MADRAS.	KARACHI.
	Per ton nett.	Per ton.	Per ton nett.	Per ton.
Woolfram . . . . .	20 cwt.	.....	.....	.....
Wool . . . . .	50 c. ft.	In s c r e w e d bales, 40 c. ft.	In bales, 50 c. ft.	In screwed bale, 40 c. ft.
Woolen cuttings . . . . .	.....	.....	50 c. ft.	.....
Zedary . . . . .	.....	16 cwt.	.....	16 bwt.
All other articles not enumerated.	50 c. ft. or 20 cwt. gross, at steamer's option.	.....	20 cwt., or 50 c. ft. at steamer's option.	.....

**NOTE 1. Calcutta.**—(a) Measurement and when necessary, weight shall be made by the Bengal Chamber of Commerce, Licensed Measurers' Department in accordance with their rules, and their certificate shall be final, and freight shall be payable in accordance therewith.

(b) Goods in casks or cases to be calculated at gross weight when paying freight by weight.  
(c) The term 'dead weight' shall be understood to mean the following articles only: sugar, salt, petre, rice, wheat, gram, dhall, and peas.

**NOTE 2. Bombay.**

**Tonnage Scale.**—At a general meeting of the Bombay Chamber of Commerce held on 20th July 1888, the following Resolution was passed:—'That the Tonnage Scale for steamers shall be on the basis of 40 cubic feet to the ton, but in no case to exceed 20 cwt. dead-weight.'

**Bones, etc.**—These standards are for guidance only. In case of disagreement either shipper or steamer may claim survey by the Chamber which may fix any scale as per standards intermediate or otherwise and that this alteration be given effect to in the supplement now being printed for publication with the report for the past year. A survey fee of Rs. 80 shall be paid on submission of the case.

**Pressed bran.**—Pressed bran to be understood as not less than 5 maunds (of 28 lbs.) in a bag of 45½ × 25 inches.

**Cutressed.**—The following Resolution was adopted at the annual general meeting on 6th March 1901: That cutressed cleaned, be for the present omitted from the Chambers' tonnage scale, and that this alteration be given effect to in the supplement now being printed for publication with the report for the past year.

**Cylindrical packings.**—On and after 1st April 1902 the following formula shall be recognized for the calculation of the cubical contents of cylindrical packings, etc., the square of the diameter be multiplied into the length and one-fifth deducted from the product (Resolution, dated 12th March 1902).

**Crushed myrobolans.**—At the annual general meeting held on 4th March 1909 it was resolved that the footnote to the item crushed myrobolans in the Chamber's tonnage scale be amended to read as follows: (as in footnote to Bones).

**NOTE 3. MADRAS.**—When cargo is measured prior to shipment, callipers should be used for measuring, and the rope or iron hoop on the one side of the package should be taken in, and left out on the other side. Half inches should be given and taken alternatively. The Callipers should be laid on the package to be measured and the sliding arm pressed lightly, i.e., without using force, against the side of the package.

**NOTE 4. KARACHI.**

**Tonnage Scale.**—The Karachi tonnage scale for steamers shall be on the basis of 40 cubic feet to the ton, but in no case to exceed 20 cwt. dead-weight, except in the case of salt.

2. The standard ton at Karachi for measurement of goods shall be taken at 50 cubic feet for ships.

3. The freight on oil to be paid on the full-gauge of the cask ascertained at the port of discharge.

4. When freight is payable on weight, the same is to be on the net weight delivered.

5. When cotton is shipped at a rate per bale, in the absence of special agreement, if the average measurement exceeds 18 feet per bale, the ship shall be entitled to proportionate extra freight, but in no case shall be compelled to take bales larger than 14 feet.

**Freight Inwards and Outwards.**—That freight inward and outward stated in sterling payable in Karachi (in the absence of stipulation to the contrary) shall be converted into Indian Currency at the Bank's best selling rate for demand on London ruling at the close of the first day on which steamer commences to discharge or load respectively and such rate shall be for all bills of lading presented for that steamer; on difference of outward freight 4½ per cent as customary in the case of sailing ships, and 1½ per cent for a steamer being allowed as discount to cover cost of insurance and interest until the due date of the freight.

**Shut-out Cargo.**—The Harbour Board ruling in relation to shut-out goods is as follows: That shut-out goods be in future charged half import and half export fees under the provisions of Rules 3 and 4 published under the Wharfrage Fees Act II of 1879.

**Bones, etc.**—The scale for grades differing from the standards to be settled by private arrangement between shippers and steamer agents. Any disputes between them to be referred to and decided by the Committee of the Chamber.

**Pressed bran.**—Pressed bran to be understood as not less than 5 mds. (of 28 lbs.) in a bag of 45½ × 25 inches.

**Cylindrical packings.**—On and after 1st March 1903, the following formula shall be recognized for the calculation of the cubical contents of cylindrical packings, etc., etc., that the square of the diameter be multiplied by the length and one-fifth be deducted from the product.

**TONNAGE SCHEDULE FOR THE PORT OF RANGOON.**

Landing charges in the case of imported goods and shipping charges in the case of exported goods are now payable to the Port Commissioners on a general basis at over-head rates instead of as formerly at varying rates according to the class of goods.

With but few exceptions, such charges are now payable by weight (20 cwts. per ton) or measurement (50 c. ft. per ton) according to the basis on which freight has been paid or is payable.

Charges payable are clearly set out in the Port Commissioners' tariff from which the following is extracted :—

	Landing Charges on Imports.	Shipping Charges on Exports.
	Rs. A. P.	Rs. A. P.
Ordinary merchandise (not exceeding one ton per package in measurement or weight).	0 1 9 p. cwt. or 0 0 8 p. c. foot	0 1 4 p. cwt. or 0 0 6 p. c. foot.
<b>EXCEPTIONS—</b>		
Coal and coke . . . . .	0 5 0 p. ton	
Salt . . . . .	0 5 0 p. ton	
Bricks and "lumps" . . . . .	2 8 0 p. 1,000	
Tiles (all kinds) loose . . . . .	2 8 0 p. 1,000	
Coconut, loose . . . . .	2 8 0 p. 1,000	
Elephants . . . . .	20 0 0 each	15 0 0 each.
Buffaloes . . . . .	5 0 0 each	3 12 0 each.
Horses, mules, cows, etc. . . . .	4 0 0 each	3 0 0 each.
Ponies, donkeys, calves, etc. . . . .	2 0 0 each	1 8 0 each.
Sheep, goats, dogs, etc. . . . .	0 6 0 each	0 4 0 each.
Excepted articles . . . . .	1% <i>ad valorem</i>	1% <i>ad valorem</i> .

In the case of Imports special rates are quoted for over-side delivery.

In the case of *Inland* vessels the following are the charges levied for goods landed on or shipped from the Port Commissioners' Premises :—

Description of goods.	Quantity.	Charges.					
		Rs.	A.	P.			
All descriptions of goods except those named below :—	20 cwt. or 50 c. foot at Commissioners' option.	}	0	5 0			
Carts, hand or bullock . . . . .	2						
Casks, empty . . . . .	12						
Drums, empty, up to 12 inch diameter . . . . .	100						
Drums, empty, over 12 inch diameter . . . . .	50						
Grass, fresh . . . . .	40 bundles						
Matches in cases . . . . .	6 cases						
Matches in tins . . . . .	72 tins						
<b>LIVE STOCK—</b>							
Buffaloes . . . . .	each . . . . .				0	5	0
Cows, bullocks, horses, ponies, mules and donkeys . . . . .	each . . . . .	0	2	6			
Calves . . . . .	per 1/2 dozen . . . . .	0	5	0			
Sheep, goats, dogs, and other small animals . . . . .	per dozen . . . . .	0	10	0			
Turkeys and geese . . . . .	per 100 . . . . .	0	5	0			
Fowls and ducks . . . . .	per 100 . . . . .	0	2	6			

APPENDIX II.

MERCHANDISE MARKS LAW.

*Part I.—Principal provisions of the Indian Merchandise Marks Act, 1889, and connected Acts relating to merchandise marks.*

*Sea Customs Act, 1878, section 18.*—No goods specified in the following clauses shall be brought, whether by land or sea, into British India :—

Indian Merchandise Marks Act, 1889, section 10.

\* \* \* \* \*

(d) Goods having applied thereto a counterfeit trade mark within the meaning of the Indian Penal Code, or a false trade description within the meaning of the Indian Merchandise Marks Act, 1889.

(e) Goods made or produced beyond the limits of the United Kingdom and British India, and having applied thereto any name or trade mark being, or purporting to be, the name or trade mark of any person who is a manufacturer, dealer or trader in the United Kingdom or in British India, unless—

- (i) the name or trade mark is, as to every application thereof, accompanied by a definite indication of the goods having been made or produced in a place beyond the limits of the United Kingdom and British India, and
- (ii) the country in which that place is situated is in that indication indicated in letters as large and conspicuous as any letter in the name or trade mark, and in the same language and character as the name or trade mark.

(f) Piecegoods, such as are ordinarily sold by length or by the piece, which—

- (i) have not conspicuously stamped in English numerals on each piece the length thereof in standard yards, or in standard yards and a fraction of such yard, according to the real length of the piece, and
- (ii) have been manufactured beyond the limits of India, or
- (iii) having been manufactured within those limits, have been manufactured beyond the limits of British India in premises which, if they were in British India, would be a factory as defined in the Indian Factories Act, 1881.

*Note.*—For definition of piecegoods, see Part II.

*Indian Merchandise Marks Act, 1889, section 2 (1).*—Trade Mark has the meaning assigned to that expression in section 478 of the Indian Penal Code as amended by this Act.

**Definitions.**

*Indian Penal Code, section 478.*—A mark used for denoting that goods are the manufacture or merchandise of a particular person is called a trade mark, and for the purposes of this Code

Section 2 of the Indian Merchandise Marks Act, 1889.

**Trade mark.**

the expression 'trade mark' includes any trade mark which is registered in the register of trade marks kept under the Patents, Designs and Trade Marks Act, 1883, and any trade mark which, either with or without registration, is protected by law in any British Possession or foreign State to which the provisions of the one hundred and third section of the Patents, Designs and Trade Marks Act, 1883, are, under Order in Council, for the time being applicable.

as amended by Act 2 of 47 Vict. c. 57.

*Indian Penal Code, section 28.*—A person is said to 'counterfeit' who causes

**Counterfeit.**

one thing to resemble another thing intending by means of that resemblance to practice deception, or knowing it to be likely that deception will thereby be practised.

*Explanation 1.*—It is not essential to counterfeiting that the imitation should be exact.

*Explanation 2.*—When a person causes one thing to resemble another, and the resemblance is such that a person might be deceived thereby, it shall be presumed until the contrary is proved, that the person so causing the one thing to resemble the other thing intended by means of that resemblance to practice deception or knew it to be likely that deception would thereby be practised.

*Indian Merchandise Marks Act, 1889, section 2 (2).*—‘Trade description’ means any description, statement or other indication, direct or indirect,—

- Trade description.
- (a) as to the number, quantity, measure, gauge or weight of any goods, or
  - (b) as to the place or country in which, or the time at which, any goods were made or produced, or
  - (c) as to the mode of manufacturing or producing any goods, or
  - (d) as to the material of which any goods are composed, or
  - (e) as to any goods being the subject of any existing patent, privilege, or copy right;

and the use of any numeral, word or mark which according to the custom of the trade is commonly taken to be an indication of any of the above matters shall be deemed to be a trade description within the meaning of this Act.

(3) ‘False trade description’ means a trade description which is untrue in a material respect as regards the goods to which it is applied, and includes every alteration of a trade description, whether by way of addition, effacement or otherwise, where that alteration makes the description untrue in a material respect, and the fact that a trade description is a trade mark or part of a trade mark shall not prevent such trade description being a false trade description within the meaning of this Act.

*Fals: Trade description.*

*Indian Merchandise Marks Act, 1889, section 4 (1).*—The provisions of this Act respecting the application of a false trade description to goods or respecting goods to which a false trade description is applied, shall extend to the application to goods of any such numerals, words or marks, or arrangement or combination thereof, whether including a trade mark or not, as are or is reasonably calculated to lead persons to believe that the goods are the manufacture or merchandise of some person other than they really are and to goods having such numerals, words or marks, or arrangement or combination, applied thereto.

*Provisions supplemental to the definition of false trade description.*

(2) The provisions of this Act respecting the application of a false trade description to goods, or respecting goods to which a false trade description is applied, shall extend to the application to goods of any false name or initials of a person, and to goods with the false name or initials of a person applied in like manner as if such name or initials were a trade description, and for the purpose of this enactment the expression false name or initials means, as applied to any goods, any name or initials—

- (a) not being a trade mark, or part of a trade mark, and
- (b) being identical with, or a colourable imitation of, the name or initials of a person carrying on business in connection with goods of the same description and not having authorised the use of such name or initials.

(3) A trade description which denotes or implies that there are contained in any goods to which it is applied more yards, feet or inches than there are contained therein standard yards, standard feet or standard inches is a false trade description.

Section 11 of the Indian Merchandise Marks Act, 1889.

*Sea Customs Act, 1878, section 19-A (3).*—Where there is on any goods a name which is identical with, or a colourable imitation of, the name of a place in the United Kingdom or British India, that name, unless accompanied in equally large and conspicuous letters and in the same language and character, by the name of the country in which such place is situate, shall be treated for the purposes of section 18..... as if it were the name of a place in the United Kingdom or British India.

*Indian Merchandise Marks Act, 1889, section 5 (2).*—A trade description shall be deemed to be applied whether it is woven, impressed or otherwise worked into or annexed or affixed to the goods or any covering label, reel or other thing.

Application of trade description.

(3) The expression 'covering' includes any stopper, cask, bottle, vessel, box, cover, capsule, case, frame or wrapper, and the expression 'label' includes any band or ticket.

Covering.

*Indian Merchandise Marks Act, 1889, section 2 (4).*—'Goods' means anything which is the subject of trade or manufacture.

Goods.

Name.

(5) 'Name' includes any abbreviation of a name.

*General Clauses Act, 1897, section 3 (39).*—'Person' shall include any company or association or body of individuals, whether incorporated or not.

Person.

*Indian Merchandise Marks Act, 1889, section 21.*—In the case of goods brought into British India by sea, evidence of the port of shipment shall, in a prosecution for an offence against this Act or section 18 of the Sea Customs Act, 1878, as amended by this Act, be *prima facie* evidence of the place or country in which the goods were made or produced.

Evidence of origin.

*Indian Merchandise Marks Act, 1889, section 21.*—An officer of the Government whose duty it is to take part in the enforcement of this Act shall not be compelled in any Court to say whence he got any information as to the commission of any offence against this Act.

Information as to commission of offences.

*Sea Customs Act, 1878, section 79-A.*—Clauses (2), (4), (5), (6) enable the Governor General in Council to make regulations respecting the conditions, if any, to be fulfilled before such detention

Rules and Regulations.

and confiscation, to determine the information, notices and security to be given, the evidence requisite for any of the purpose of the section and the mode of verification of such evidence, as well as the reimbursement of public officers and the State by an informant for expense and damages incurred in respect of any detention made on his information, and of any proceedings resulting therefrom. Section 19A (1) authorises the Customs authorities to require regulations so issued to be complied with before taking proceedings.

*Indian Merchandise Marks Act, 1889, section 16 (1).*—The Governor General in Council may, by notification in the *Gazette of India* and in local official *Gazettes*, issue instruction for observance by Criminal Courts in giving effect to any of the provisions of this Act.

(2) Instructions under sub-section (1) may provide, among other matters, for the limits of variation, as regards number, quantity, measure, gauge or weight, which are to be recognised by Criminal Courts as permissible in the case of any goods.

*Note.*—Such instructions are also a guide to Customs officers.

*Indian Merchandise Marks Act, 1889, section 19.*—For the purposes of section 12 of this Act and clause (f) of section 18 of the Sea Customs Act, 1878, as amended by this Act, the Governor General in Council may, by notification in the *Gazette of India*, declare what classes of goods are included in the expression 'piece goods' such as are ordinarily sold by length or by the piece.

*Indian Merchandise Marks Act, 1889, section 20.*—This section enables the Governor General in Council to make rules regulating with respect to any goods the first selection and testing of samples, the value of the evidence so obtained, the conditions under which a further selection and testing may be made, and the value of the further evidence so obtained.

For goods not covered by such rules the section enables Customs officers to issue orders having a similar effect, namely:—

(2) The . . . officer of Customs . . . having occasion to ascertain the number, quantity, measure, gauge or weight of the goods, shall, by order in writing, determine the number of samples to be selected and tested and the manner in which the samples are to be selected.

(3) The average of the results of the testing in pursuance of . . . . an order under sub-section (2) shall be *prima facie* evidence of the number, quantity, measure, gauge or weight, as the case may be, of the goods.

(4) If a person having any claim to, or in relation to, any goods of which samples have been selected and tested in pursuance of . . . . an order under sub-section (2) desires that any further samples of the goods be selected and tested, they shall, on his written application and on the payment in advance by him to the . . . . officer of Customs. . . . of such sums for defraying the cost of the further selection and testing as the . . . . officer may from time to time require, be selected and tested to such an extent as . . . . the officer of Customs may determine in the circumstances to be reasonable, the samples being selected in manner prescribed under . . . . sub-section (2) . . . .

(5) The average of the results of the testing referred to in sub-section (3) and of the further testing under sub-section (4) shall be conclusive proof of the number, quantity, gauge or weight, as the case may be, of the goods.

*Part II.—Notifications under the Indian Merchandise Marks Act, 1889, and connected Acts.*

*No. 1430, dated the 6th April 1891, as subsequently amended.*—In exercise of the powers conferred by section 19-A, sub-section (2), of the Sea Customs Act, 1878 (as amended by section 11 of the Indian Merchandise Marks Act, 1889), and sections 19 and 20 of the Indian Merchandise Marks Act, 1889 (as amended by Act IX of 1891), the Governor General in Council is pleased to make the subjoined rules and orders :—

1. Piecegoods, such as are ordinarily sold by length or by the piece, shall be deemed to include woollen goods of all kinds and the undermentioned descriptions of cotton goods, namely :—

Book-binding cloth.	Mulls.
Brocades.	Muslins.
Cambrics.	Nainsooks.
Canvas.	Net.
Crimps.	Oxfords.
Checks, spots and stripes.	Printers.
Chudders.	Prints.
Coatings, including tweeds, cashmeres and serges.	Saris, single or in pairs.
Crape.	Scarves, including cotton shawls and dupetas.
Denims.	Sheetings.
Dhooties, single or in pairs.	Shirtings, including dyed shirtings.
Domestics.	Silecia.
Dorics.	Spanish stripes.
Drills.	Tanjibs.
Flannel and flannelette.	Ticks.
Gauze.	Trouserings.
Grenadines.	Tussora.
Harvards.	Twills.
Italian cloth.	T.-cloth and Mexicans.
Jaconets.	Umbrella cloth.
Jeans.	Velvets and velveteen.
Lappets.	Venetian cloth.
Lawns, including allovers.	Vestings, including mattings and piques.
Lenos.	Waistcoatings.
Longcloth.	Zephyr cloth.
Madapolams.	
Meltons, dyed and printed.	

2. Other classes of piecegoods shall not be detained if unstamped; and unstamped cotton and woollen piecegoods imported for the personal use of individuals or private associations of individuals and not for trade purposes shall not be detained.

3. Examinations of packages to ascertain whether the goods mentioned in Rule 1 are stamped shall be made at frequent intervals at the discretion of the Customs Collector and either under his personal instructions or under general orders, and instruction given by him to an Assistant Collector.

4. The piecegoods contained in the packages so examined need not be examined when found to be stamped, to test the accuracy of the stamping, except on information received, or when the Customs Collector has reason to suspect that the stamping is false.

5. All measurements of piecegoods shall be made on the table.

6. Yarns need not be examined or measured, except on information received, or when the Collector has reason to suspect that the trade description is false.

Testing of yarns.

7. An examination of yarns to test the accuracy of the description of count or length shall be made, in the first instance, up to the limit of one bundle in every one hundred bales or fraction of one hundred bales in the consignment.

8. If, on such examination, the difference between the average count or length and the described count or length is in excess of the variations permitted in paragraphs III and IV of the Notification of the Government of India in the Home Department, No. 1474 (Judicial), dated the 13th November 1891, the importer may require a further examination to be made up to the limit and on the condition stated in Rule 9.

9. The test to determine length of yarns shall be applied as follows:—

From every one hundred bales, or fraction of 100 bales, in a consignment one bundle should be selected at random. The hanks in this bundle should then be measured on the wrsp-reel, one after the other, in the presence of a representative of the importer, and the lengths noted, the process being continued (within the limits of the bundle) until either the importer is satisfied that the yarn is short, or the average of the lengths noted shows that it is of full length.

When the importer is dissatisfied with this test, he may, on payment of the cost, require the Customs Collector to measure more hanks up to 1 per cent of the total number of hanks in the consignment, such hank being taken at random by an officer of Customs out of any bundles in the consignment.

10. The Customs Collector may require from any informant a security not exceeding five hundred rupees. If the Collector should be satisfied that the information given is wilfully false, the security shall be forfeited.

2. No. 1474, dated the 13th November 1891, as subsequently amended.—In exercise of the powers conferred by section 16 of the Indian Merchandise Marks Act, IV of 1889, and in pursuance of all existing orders on the subject, the Governor General in Council directs that Criminal Courts, in giving effect to the provisions of the Act in respect of trade descriptions of quantity, measure, or weight of the goods specified hereunder, shall observe the following instructions:—

1.—A trade description of length stamped on grey, white, or coloured cotton piecegoods shall not be deemed to be false in a material respect, unless—

(a) where a single length is stamped, the description exceeds the actual length by more than—

- 4 inches in pieces stamped as 10 yards long and under;
- 5 inches in pieces stamped as above 10 yards and up to 23 yards long;
- 7 inches in pieces stamped as above 23 yards and up to 36 yards long;
- 9 inches in pieces stamped as above 36 yards and up to 47 yards long;
- 18 inches in pieces stamped as above 47 yards long;

Provided that the average length of the goods in question shall not be less than the stamped length ;

- (b) where a maximum and a minimum length are stamped, the described maximum length is greater than the actual length by more than—
- 9 inches in piecegoods under 35 yards long ;
  - 18 inches in piecegoods 35 yards and up to 47 yards long ;
  - 36 inches in piecegoods above 47 yards long ;

Provided that no such piece shall measure less than the minimum stamped length.

- II.—A trade description of width stamped on *grey, white, or coloured cotton piecegoods* shall not be deemed to be false in a material respect, unless the description exceeds the actual width by—
- half an inch in pieces stamped as 40 inches or less in width ;
  - three-quarters of an inch in pieces stamped as over 40 inches or under 59 inches in width ;
  - one inch in pieces stamped as 59 inches or more in width ;

Provided that the average width of the goods in question shall not be less than the stamped width.

III.—A trade description of count or number, length or weight, applied to *grey Trade descriptions of count or number, length or weight, applied to grey or bleached cotton yarn, shall not be deemed to be false in a material respect, unless—*

- (a) the described count or number is greater or less than the actual count or number by more than 5 per cent, provided that the average count of the whole of the yarn in question is not greater or less than the described count ; or
- (b) the average length of the whole number of hanks in a bundle is less than 840 yards ; or
- (c) in a bundle of yarn of any count under 50, described as being ten pounds in weight, the number of knots of twenty hanks each is not half, or the number of knots of ten hanks each is not the same as, and the number of knots of five hanks is not double, the described count or number of the yarn ; or
- (d) in a bundle of yarn of any count under 50, described as being 5 lbs. in weight, the number of knots of 20 hanks each is not a quarter of, or the number of knots of 10 hanks each is not half, or the number of knots of 5 hanks each is not the same as, the described count or number of the yarn ; or
- (e) in a bundle of yarn of any count from 50 upwards, the number of knots of twenty hanks each is not half, or the number of knots of 40 hanks each is not a quarter when the described weight is ten pounds, and is not a quarter or an eighth, when the described weight is five pounds, of the count or number of the yarn ; or
- (f) in the case of *bleached yarn*, the described weight exceeds the actual weight by more than—
  - 7½ per cent in counts from 1 to 8 ;
  - 5 per cent in counts from above 8 to 18 ;
  - 4 per cent in counts from above 18 to 30 ;
  - 2½ per cent in counts from above 30 to 80.

IV.—A trade description of count or number applied to a bundle of *dye-d cotton yarn* shall be accepted as indicating length only, the hank being taken to measure 840 yards, and it shall be deemed to be false in a material respect if the average length of the hanks in a bundle is less than 819 yards.

V.—A trade description of length applied to *thread of any kind (of cotton, wool, flax or silk)* shall not be deemed to be false in a material respect, unless it exceeds the actual length by more than 1 per cent.

VI.—The dimensions of goods on which their length or width is stamped shall be determined by measurement in imperial yards of thirty-six inches.

APPENDIX III.

THE PRINCIPAL RAILWAYS IN INDIA AND THE AREA AND TRADE CENTRES SERVED BY THEM.

Railways and Headquarters.	Mileage open or in the course of construction on 31st March 1923.	Gauge. †	Area served with principal internal trade centres.
Bengal Nagpur Railway. (Calcutta.)	3,116	A (2,177 miles) C (894 miles) D (45 miles)	Eastern half of the Central Provinces, Bihar and Orissa and down to Vizagapatam in Madras Presidency. Raipur, Nagpur, Jubbulpore, Amraoti.
Bombay, Baroda and Central India Railway. (Bombay.)	3,819	A (1,230 miles) B (2,431 miles) C (158 miles)	Northern half of the Bombay Presidency, Central India and Southern Rajputana. Surat, Broach, Ahmedabad, Muttra, Delhi.
*Eastern Bengal Railway. (Calcutta.)	1,728	A (615 miles) B (1,058 miles) C (55 miles).	Eastern Bengal, the north-western portion of Assam and the northern Gangetic plain in Bengal to the foot of the Himalayas. Naihati, Murshidabad, Patna, Goalundo, Narsinganj, etc.
East Indian Railway. (Calcutta.)	2,796	A . . .	Southern end of the Punjab, United Provinces, Bihar and Western Bengal. Jamshedpur, Mirzapur, Benares, Allahabad, Cawnpore, Agra, Delhi, etc.
Great Indian Peninsula Railway. (Bombay.)	3,459	A (3,245 miles) C (201 miles) D (13 miles)	Central portion of Bombay Presidency, Hyderabad, western half of Central Provinces, Central India, lower part of the United Provinces and some part of Rajputana. Poona, Raichur, Ahmednagar, Nasik, Sholapur, Akola, Amraoti, Nagpur, Jubbulpore, Katni, Gwalior, Agra, etc.

\* Indicate State Railways.  
† A Standard gauge 5'6". B Metre gauge 3'3½". C Narrow gauge 2'6". D Narrow gauge 2'0".

THE PRINCIPAL RAILWAYS IN INDIA AND THE AREA AND TRADE CENTRES  
SERVED BY THEM—*contd.*

Railways and Headquarters.	Mileage open or in the course of construction on 31st March 1923.	Gauge.†	Area served with principal internal trade centres.
Madras and Southern Mahratta Railway. (Madras.)	3,040	A (1,072 miles) B (1,968 miles)	North-eastern and central parts of the Madras Presidency, a small part of Hyderabad, and the southern part of Bombay Presidency and Mysore. Bangalore, Guntakal, Poona, Guntur, Bezwada, Ellore, Cocanada.
Nizam's Guranteed State Railway. (Secunderabad)	997	A (410 miles) B (587 miles)	Hyderabad State. Bezwada, Singareni, Hyderabad.
* North Western Railway. (Lahore.)	5,791	A (5,353 miles) C (438 miles)	Sind, the Punjab, North-West Frontier Province, Baluchistan. Hyderabad (Sind), Larkana, Shikarpur, Jacobabad, Quetta, Rawalpindi, Lahore, Amritsar, Lyallpur, etc.
* Oudh and Rohilkhand Railway. (Lucknow.)	1,823	A (1,540 miles) B (83 miles)	Central and eastern parts of the United Provinces. Benares, Lucknow, Fyzabad, Aligarh, Meerut, Saharanpur, Dehra Dun.
South Indian Railway. (Trichinopoly.)	1,877	A (450 miles) B (1,329 miles) C (98 miles)	Whole of Southern India, south and west of the Jolarpet Section of the Madras and Southern Mahratta Railway connecting <i>via</i> Dhanuskodi with Ceylon. Trichinopoly, Madura, Salem, Coimbatore, Calicut and Tuticoria.
Assam-Bengal Railway. (Chittagong.)	1,049	B . . .	The Province of Assam. Narsingunj, Sylhet, Bilchar, Gauhati, etc.
Bengal and North-Western Railway. (Gorakhpur, U. P.)	2,059	B . . .	Northern portions of the United Provinces and of Bihar. Monghyr, Gorakhpur, Allahabad, etc.
Burma Railways . (Rangoon.)	1,822	B . . .	Upper and Lower Burma. Prome, Pegu, Myingyan, Mandalay, Bassein, Martaban (for Moumein), etc.

\* indicate State Railways.

† A Standard gauge 5' 6". B Metre gauge 3' 3½". C Narrow gauge 2' 6". D Narrow gauge 2' 0".

## APPENDIX IV.

### REGULATIONS GOVERNING THE ADMISSION INTO BRITISH INDIA OF SAMPLES AND PATTERNS BROUGHT BY COMMERCIAL TRAVELLERS FROM THE UNITED KINGDOM.

#### I.—*Importation.*

(1) On the production by a commercial traveller of a list or declaration containing a full description of every sample brought by him, officially attested by the Customs authorities in the United Kingdom, examination of the samples may be limited to ascertaining that they are fully enumerated on the list produced.

(2) The list referred to in the preceding paragraph is to be utilized in assessing the duty chargeable on the samples. A deposit of the duty is required before delivery of the samples, or alternatively a bond (with sufficient security) for the amount thereof may be accepted instead of a cash deposit.

(3) If the commercial traveller is unprovided with the list referred to in paragraph 1, he may be required to produce to the Collector of Customs a certificate or letter of identity from his principals or otherwise satisfy the Collector of his eligibility for the concession. If the Collector is satisfied on this point, a list will be compiled by the commercial traveller, giving a full description of every sample sufficient for identification and assessment of the duty chargeable thereon. The duty will be deposited or security given as set out in the preceding paragraph.

(4) Should the samples bear the marks, stamps or seals of the country of exportation, no additional marks or seals for purposes of identification need, as a rule, be affixed by officers of the Customs Department. Contrariwise, if the samples on importation bear no seals they are to be marked or sealed for future identification, should such a course be deemed necessary, by the Customs officers at the port of arrival.

(5) The list of the samples, whether that produced by the commercial traveller or that compiled at the port of arrival, will be signed and dated by the officer at the port or place of importation, who will affix to the list a statement bearing the official seal or stamp, and showing—

- (a) the name of the port at which the samples are imported, and the amount of duty chargeable on the patterns or samples; also whether it was deposited in money or whether security was given;
- (b) the marks, if any, that have been applied to the patterns or samples;
- (c) the date upon which the amount of duty deposited will be carried to the public account or the amount recovered under the security given unless it is proved that the patterns or samples have been previously re-exported or placed in bond. This date is to be not later than twelve months from that upon which the samples were brought into the country

No charge is to be made for the document issued or certified by the Customs officers or for marking for identification.

(6) The production of the list referred to in paragraph 1 will not be required in the case of patterns or samples not liable to duty, and the examination of packages containing such patterns or samples will be restricted to ascertaining that no dutiable articles are contained therein, and that the goods produced are *bonâ fide* samples.

All samples of no commercial value are entitled to free entry.

## *II.—Exportation.*

7) Patterns and samples of dutiable articles may be produced to the Customs officers at any port in British India for examination prior to exportation.

(Non-dutiable samples are not required to be produced on shipment.)

(8) To obtain the return of the deposit made on entry of the patterns or samples, or the cancellation of the bond entered into, the commercial traveller is required to produce with his samples the list thereof, signed by the officers at the port of arrival: Provided that the time allowed for production [see paragraph 5 (c)] has not been exceeded, and the Customs officers are satisfied that the goods as produced are identical with those enumerated on the list, the amount of duty originally deposited will be refunded. The list is to be noted as to the exportation of the samples, the statement referred to in paragraph 5 being retained.

(9) The statement is to be transmitted, with a certificate of exportation of the samples, to the Collector at the port of importation, with the object of having an adjustment of accounts effected, where a deposit has been made, or the bond cancelled, as the case may be.

APPENDIX V.

GOVERNMENT CROP FORECASTS.

The following statement shows the dates on which provincial forecasts of crops are transmitted by Local Governments and the dates on or about which general memoranda are published in the *Indian Trade Journal* by the Commercial Intelligence Department :—

Provinces and crops concerned.	Issue by Local Government.	Issue of consolidated forecast by Director-General of Commercial Intelligence.
<b>Rice.</b>		
<i>1st report—</i>		
Bengal, Bihar and Orissa and Assam.	April . . . . .	} October 20 (1st memorandum)
Bombay	September 30	
Central Provinces and Berar	October 1	
Burma, Madras and United Provinces	" 3	
Hyderabad	" 15	
Baroda . . . . .	" 15	
<i>2nd report—</i>		
Burma (2nd report)	November 15	} December 20 (2nd memorandum)
Bombay	December 1	
Bengal Bihar and Orissa and Assam (Autumn† and Winter)	" 15	
Burma (3rd report)	" 15	
Madras and United Provinces	" 15	
Central Provinces and Berar (final)	" 15	
Hyderabad	" 15	
Baroda . . . . .	" 15	
<i>3rd report—</i>		
Burma (4th report)	January 15	} February 20 (Final memorandum)
Bengal, Bihar and Orissa and Assam (Winter)	February 15	
Bombay (Spring)	" 15	
Burma (5th report)	" 15	
Madras, United Provinces and Coorg	" 15	
Mysore (Preliminary)	" 15	
Hyderabad	" 15	
Baroda . . . . .	" 15	
<i>4th report—</i>		
Mysore . . . . .	April . . . . .	} Not issued.
Hyderabad . . . . .	May . . . . .	

† With other rabi crops in the case of Bengal and Bihar and Orissa.

‡ With other autumn or bhadoi crops in the case of Bengal and Bihar and Orissa.

GOVERNMENT CROP FORECASTS—*contd.*

Provinces and crops concerned.	Issue by Local Government.	Issue of consolidated forecast by Director-General of Commercial Intelligence.
<b>Wheat.</b>		
<i>1st report</i> — Punjab, United Provinces, Central Provinces and Berar, Bombay, North-West Frontier Province, Bengal, Bihar and Orissa, Ajmer-Merwara, Delhi, Mysore, Hyderabad, Central India, Rajputana, Baroda, Gwalior.	January 20	January 31 (1st memorandum)
<i>2nd report</i> — All provinces mentioned above.	March 1	March 15 (2nd memorandum)
<i>3rd report</i> — All provinces mentioned above.	April 10	April 20 (3rd memorandum)
<i>4th report</i> — All other provinces mentioned above. North-West Frontier Province	May 15 " 22	May 30 (4th memorandum)
<i>5th report</i> — All provinces mentioned above	August 1	August 10 (Final memorandum)
<b>Cotton.</b>		
<i>1st report</i> — Punjab, United Provinces, Central Provinces and Berar, Madras, Burma, North-West Frontier Province, Assam, Bengal, Bihar and Orissa, Ajmer-Merwara, Hyderabad, Rajputana, Central India, Mysore, Delhi, Baroda, Gwalior and Bombay (early).	August 10	August 15 (1st memorandum)
<i>2nd report</i> — All provinces mentioned above.	October 10	October 15 (2nd memorandum)
<i>3rd report</i> — All provinces mentioned above.	December 10	December 15 (3rd memorandum)
<i>4th report</i> — All provinces mentioned above.	February 10	February 15 (Final memorandum)
<i>5th report</i> — Madras . . . . .	April 15	April 15 (Supplementary memorandum)

GOVERNMENT CROP FORECASTS—contd.

Provinces and corps concerned.	Issue by Local Government.	Issue of consolidated forecast by Director-General of Commercial Intelligence.	
<b>Linseed, rape and mustard (Winter oilseeds).</b>			
<i>1st report—</i>			
Hyderabad (all oilseeds)	November	} January 1 (1st memorandum)	
Punjab, Bengal, Bihar and Orissa	December 20		
United Provinces and Bombay (rape and linseed).	" 20		
Central Provinces and Berar (linseed)	" 20		
Assam (rape and mustard)	" 20		
North-West Frontier Province (rape-seed).	" 20		
Delhi, Baroda and Alwar (rape and mustard).	" 20		
Kotah (linseed)	" 20		
Madras (castor)	January		
<i>2nd report—</i>			
Hyderabad (all oilseeds)	February	} March 15 (2nd memorandum)	
Punjab, Bengal, Bihar and Orissa	March 1		
United Provinces and Bombay (rape and linseed).	" 1		
Central Provinces and Berar (linseed)	" 1		
Assam (rape and mustard seed)	" 1		
North-West Frontier Province (rape-seed).	" 1		
Delhi, Baroda and Alwar (rape and mustard).	" 1		
Kotah (linseed)	" 1		
<i>3rd report—</i>			
Punjab, Bengal, Bihar and Orissa	May 15		} June 1 (Final memorandum)
United Provinces and Bombay (rape and linseed).	" 15		
Central Provinces and Berar (linseed)	" 15		
Kotah (linseed)	" 15		
Alwar, Delhi and Baroda (rape and mustard).	" 15		
North-West Frontier Province (rape-seed).	" 22		
<i>Sesams (sil or gingelly).</i>			
<i>1st report—</i>			
Bengal (early crop)	July 31	} September 1 (1st memorandum)	
Burma (early crop)	August 10		
Bombay, Madras, Central Provinces and Berar, United Provinces	" 15		
Ajmer-Merwara, Punjab, Bihar and Orissa, Baroda and Kotah.			

GOVERNMENT CROP FORECASTS—*contd.*

Provinces and Corps concerned.	Issue by Local Government.	Issue of consolidated forecast by Director-General of Commercial Intelligence.
<b>Sesame (til or gingelly)—<i>contd.</i></b>		
<i>2nd report—</i>		
Burma (early and late) . . . . .	October 10	} October 20 (2nd memorandum)
All other provinces mentioned above except Bengal.	" 15	
<i>3rd report—</i>		
Hyderabad . . . . .	November	} January 15 (Final memorandum)
Burma (late crop) . . . . .	December 10	
Bengal (late crop) . . . . .	" 31	
All other provinces mentioned above.	January 1	
Madras . . . . .	" 12	
<i>4th report—</i>		
Burma (early and late) . . . . .	January 10	} April 20 (Supplementary memorandum)
Burma (early and late) . . . . .	February 10	
<i>5th report—</i>		
Hyderabad . . . . .	February	}
Madras . . . . .	April 15	
<b>Groundnut.</b>		
<i>1st report—</i>		
Burma . . . . .	August 10	} Not issued.
Bombay . . . . .	" 15	
<i>2nd report—</i>		
Burma . . . . .	October 10	} October 20 (1st memorandum)
Bombay . . . . .	" 15	
Madras (1st report) . . . . .	" 15	
<i>3rd report—</i>		
Burma . . . . .	December 10	} February 15 (Final memorandum)
Bombay . . . . .	January 15	
Madras (2nd report) . . . . .	February 10	
Burma (4th report) . . . . .	" 10	
Hyderabad . . . . .	February	
<b>Indigo.</b>		
<i>1st report—</i>		
Madras . . . . .	September 15	} October 15 (1st memorandum)
Bengal, Bihar and Orissa . . . . .	" 30	
United Provinces and Bombay . . . . .	October 1	
Punjab . . . . .	" 15	
<i>2nd report—</i>		
Bombay . . . . .	December 1	} December 20 (Final memorandum)
Madras, Bengal, Bihar and Orissa and United Provinces . . . . .	" 15	
Punjab . . . . .	" 20	

**GOVERNMENT CROP FORECASTS—concl'd.**

Provinces and crops concerned.	Issue by Local Government.	Issue of consolidated forecast by Director-General of Commercial Intelligence.
<b>Sugarcane.</b>		
<i>1st report</i> — Bengal, Bihar and Orissa, Assam, Madras, United Provinces, Punjab, North-West Frontier Provinces, Bombay, Central Provinces and Berar, Delhi and Baroda.	August 15	August 20 (1st memorandum)
<i>2nd report</i> — All provinces mentioned above.	October 15	October 20 (2nd memorandum)
<i>3rd report</i> — All the provinces mentioned above } Mysore (Preliminary) . . . . . }	January 31	February 5 (Final memorandum)
<i>4th report</i> — Mysore . . . . .	April	Not issued.
<b>Jute.</b>		
<i>1st report</i> — Bengal, Assam, Bihar and Orissa . . . . .	..	July 7—15*
<i>2nd report</i> — Bengal, Assam, Bihar and Orissa . . . . .	..	September 21*

\* Issued by the Director of Agriculture, Bengal.

## APPENDIX VI.

### GLOSSARY OF INDIAN TERMS USED IN THIS BOOK.

#### A

Abkari . . . . .	. . . . .	Excise of liquors and drugs.
Ajwan . . . . .	. . . . .	An essential oilseed obtained from <i>carum copticum</i> .
Ajwan-ka-phul . . . . .	. . . . .	Thymol ( <i>lit.</i> flowers of ajwan).
Arathdar . . . . .	. . . . .	From <i>arath</i> a warehouse—a middleman.
Arhar . . . . .	. . . . .	The pigeon pea ( <i>cajanus indicus</i> ).
Ari . . . . .	. . . . .	Lac collected before the insects swarm.
Atta . . . . .	. . . . .	Coarse wheat flour used by the poorer classes, intermediate in quality between <i>maida</i> and <i>suji</i> (q. v.).
Attar . . . . .	. . . . .	The fragrant essential oil of roses, jasmine and other flowers.
Avaram . . . . .	. . . . .	The Tamil name for the bark of <i>cassia auriculata</i> extensively used in Southern and Western India for tanning hides and skins. Called <i>tarwad</i> or <i>tarwar</i> in the Bombay Presidency.

#### B

Babul . . . . .	. . . . .	A thorny tree ( <i>Acacia arabica</i> ) which in Sind is a common host of the lac insect. The bark is used for tanning.
Bajra . . . . .	. . . . .	The bulrush millet ( <i>pennisetum typhoideum</i> ), known as <i>cumbu</i> in South India.
Ballam . . . . .	. . . . .	A particular quality of boiled rice, long-grained.
Bania . . . . .	. . . . .	A petty shop-keeper or money-lender.
Bhang . . . . .	. . . . .	The dried leaves and flowering shoots of <i>cannabis sativa</i> , which ground to a paste and taken as an emulsion are a powerful narcotic.
Beer (ber) . . . . .	. . . . .	A thorny shrub ( <i>zizyphus jujuba</i> ), which in the Punjab is a common host of the lac insect.
Bepari . . . . .	. . . . .	A small trader, who acts as a middleman in the marketing of grain, hides, etc.
Biri (bidi) . . . . .	. . . . .	Country made cigarette.
Bispath . . . . .	. . . . .	An inferior quality of tobacco obtained in Bengal.
Borah . . . . .	. . . . .	A bamboo basket in which wool is transported.
Bysaki . . . . .	. . . . .	One of the four lac crops called after the Bengali month 'Bysak' corresponding to April-May, when it comes commercially into sight.

#### C

Catamaran . . . . .	. . . . .	A floating raft made of logs tied together.
Chabyam . . . . .	. . . . .	A quality of unpolished rice obtainable in Southern India.
Chadar . . . . .	. . . . .	A shawl, of cotton, wool or silk.

GLOSSARY OF INDIAN TERMS USED IN THIS BOOK—*contd.*

C—*contd.*

Chapati (Chaupatti)	An unleavened cake made generally of <i>atta</i> or coarse wheat flour.
Charas	The narcotic resin of <i>cannabis sativa</i> , used for smoking.
Chasam	Silk waste.
Chauki	An outpost for the collection of revenue.
Chekku	A Malayalam word, meaning 'a small mill' corrupted into chuck-mill.
Chetty	A caste in South India, money-lenders, or merchants by profession.
Cooly	An Indian labourer.
Cholam	The Tamil name for the large millet ( <i>sorghum vulgare</i> ) known as <i>jowar</i> in Northern India.
Copra	The dried meat of the coconut.
Corge	A score.
Creore	Ten million; generally applied to the currency. A crore of rupees = £866,666

D

Dahi (Dayi)	Curdled boiled milk.
Dari	A pileas cotton carpet.
Deodar	The Himalayan cedar ( <i>cedrus libani v. deodara</i> ).
Deshi (daisee)	An Urdu word meaning 'indigenous' applied as a trade name to varieties of jute and other produce.
Dhal	A generic term applied to various pulses.
Dhak	<i>Butea frondosa</i> , a common host of the lac insect, also known as <i>palas</i> .
Dholl	A bundle or package.
Dhooti	Piece of cloth in varying lengths with coloured border worn by men.
Dhow	A small country boat.
Dowd Khani	A variety of boiled brown Bengal rice.

E

Eng (Ing)	A deciduous forest tree ( <i>dipterocarpus tuberculatus</i> ) yielding valuable timber, grown chiefly in Burma
Eri	A variety of silk-worm (Assam).

G

Ganja	A narcotic derived from the unfertilised flowers of the female plants of <i>cannabis sativa</i> .
Ghi (ghee)	Clarified butter.
Godown	A ware house.
Gur	Crude molasses.

GLOSSARY OF INDIAN TERMS USED IN THIS BOOK—*contd.*

**H**

Hundi (hoondee) . . . An Indian bill of exchange.

**J**

Jainama (ja-namaz) . . . A pileless cotton prayer mat.  
 Jamkalam . . . . . A pileless cotton carpet made in Southern India.  
 Jethwa . . . . . The lac crop which comes on the market in June-July called after the corresponding Bengali month 'Jaistha.'  
 Jowar . . . . . See *cholam*.

**K**

Ka'nit . . . . . A mineral manure.  
 Kala-til . . . . . Niger seed, lit. 'black til' from its resemblance to sesame or til.  
 Kapok . . . . . The floss of the white silk cotton tree (*eriadendron anfractuosum*). A Malay word.  
 Katki . . . . . A lac crop that comes commercially into sight in November, called after the corresponding Bengal month 'Kartik.'  
 Kazla (kajla) . . . . . The commonest variety of boiled rice obtainable in Bengal.  
 Khadder . . . . . Cloth made from hand-spun yarn.  
 Khair . . . . . Cutch, obtained from the heart-wood of *acacia catechu*.  
 Khari . . . . . Glauber's salt or sodium sulphate.  
 Kharif . . . . . The crop sown just before or during the South-West monsoon.  
 Khood (coodie) . . . . . Broken rice.  
 Kiri . . . . . Residue left over in the manufacture of shellac, containing about 50 per cent of lac.  
 Kurpah (Cuddapah) . . . . . A quality of Madras indigo sold in Calcutta.  
 Kushmi . . . . . One of the four lac crops marketed in November-December.  
 Kusum (oil) . . . . . Carthamus oil, obtained from *carthamus tinctoria*.  
 Kusumb . . . . . A forest tree (*schleichera trijuga*) the host of the lac insect from which the best lac is derived.  
 Kutcha (kaccha) . . . . . An Urdu word meaning inferior or bad.  
 Kuthia . . . . . Inferior quality of saltpetre of from 20 to 40 per cent refraction.

**L**

Lakh . . . . . One hundred thousand.  
 Let-pet . . . . . Pickled tea, eaten as a condiment in Burma and the Shan States.  
 Lungi (Loongi) . . . . . A tubular piece of cloth of silk or cotton worn as a waist cloth.

GLOSSARY OF INDIAN TERMS USED IN THIS BOOK—*contd.*

M

Masula . . . . .	A small boat (South India).
Maddar . . . . .	Applied to two different varieties of plants whose roots yield a red dye.
Mahajan . . . . .	A money-lender or big merchant who advances money to the cultivator against his crops.
Mahua (mowra) . . . . .	A forest tree ( <i>bassia latifolia</i> ) whose dried flowers are eaten as food or distilled into liquor.
Maida . . . . .	Wheat flour superior to <i>atta</i> obtained by regrinding <i>suji</i> or coarse flour and passing it through fine sieves.
Masur . . . . .	The lentil ( <i>lens esculenta</i> ).
Maund (man) . . . . .	A weight varying in different localities (see under weights and measures, p. 333).
Mohur . . . . .	A gold coin (see coinage, p. 332).
Monsoon . . . . .	Periodical rain-bearing winds. Applied to the two rainy seasons in India; the South-West monsoon from June to September and the North-East from October to December.
Muga . . . . .	A variety of silk-worm (Assam).
Mung . . . . .	A common variety of pulse ( <i>phaseolus radiatus</i> ).

N

Neyi . . . . .	The South-Indian term for <i>ghi</i> .
Nuniya (Noonia) . . . . .	The producer of crude, unrefined saltpetre.

O

Omam (water) . . . . .	Liquor obtained by distillation from <i>carum copticum</i> .
------------------------	--

P

Padauk . . . . .	A valuable timber tree ( <i>pterocarpus macrocarpus</i> ) grown in Burma.
Paka (oil) . . . . .	Oil obtained from the seeds of <i>schleichera trijuga</i> .
Palas . . . . .	See <i>dhak</i> .
Pan supári . . . . .	The universal masticatory composed of <i>pan</i> (leaf of betel vine), and <i>supári</i> (fruit of the betel palm), with an admixture of lime, cloves, etc.
Pashm . . . . .	The fine underwool of a species of Tibetan goat.
Pashmina . . . . .	Woolen cloth obtained from <i>pashm</i> wool (see above).
Pebugalé . . . . .	The Rangoon white bean ( <i>phaseolus lunatus</i> ).
Phunki . . . . .	Lac collected after the insects have swarmed.
Pipul . . . . .	A sacred tree ( <i>ficus religiosa</i> ) an occasional host of the lac insect.
Poolah . . . . .	A variety of tobacco grown in Bengal.
Poonac . . . . .	Strictly speaking the residual cake left in the <i>chekkas</i> or mills after extracting coconut oil from copra, but also applied to linseed, gingelly and other oil cakes.
Pucca . . . . .	An Urdu word meaning good, correct, substantial, of standard quality or measurement, as contrasted with <i>butcha</i> .
Puttoo . . . . .	Thick woollen cloth made from the coarser wool of the sheep.

GLOSSARY OF INDIAN TERMS USED IN THIS BOOK—concl.

R

- Rabi . . . . . The spring crop sown during or after the North-East monsoon and harvested in March or April.  
 Raree . . . . . A quality of boiled brown rice, obtainable in Bengal.

S

- Sal . . . . . A fine-timber-yielding tree (*shorea robusta*) which is also a common host of the lac insect.  
 Sann (hemp) . . . . . Fibre obtained from *crotalaria juncea*.  
 Sari . . . . . A piece of cloth of varying lengths with broad coloured borders worn by Indian women.  
 Sarson . . . . . Indian colza, a subspecies of *brassica campestris*, commercially called rape.  
 Seer . . . . . A weight or measure varying in size in different parts of the country (see under weights and measures, page 333).  
 Shatranji . . . . . A pileless cotton floor mat.  
 Shisham . . . . . A timber tree (*dalbergia sissoo*).  
 Shiyah-zirah . . . . . The seeds of *carum indicum*, the Indian caraway.  
 Shroff . . . . . A banker or money-changer.  
 Simal . . . . . The red silk cotton tree (*bombax malabaricum*).  
 Sindine . . . . . A variety of tobacco obtainable in Burma.  
 Sirdar . . . . . A headman or overseer.  
 Siris . . . . . A forest tree (*albizzia lebbek*), a host of the lac insect.  
 Sujji . . . . . The poorest quality of wheat flour.

T

- Taluk . . . . . A revenue sub-division of a district. (Bombay Madras and Mysore.)  
 Tasar . . . . . Wild silk worms, *antheraea paphia*, also applied to the cloth made from their silk.  
 Tarwad (tarwar) . . . . . See *avaram*.  
 Thindoor . . . . . A variety of tobacco obtainable in Burma.  
 Til (teel) . . . . . Gingelly or *sesamum indicum*, the sesame of commerce.  
 Tincal . . . . . Crude borax.  
 Tola . . . . . The weight of a rupee equivalent to 180 grs. troy.  
 Toon . . . . . A valuable timber tree also known as the Indian mahogany (*cedrela toona*).  
 Toria (tori) . . . . . Rape (*brassica campestris*).

Z

- Zaminder . . . . . A landholder under the Permanent Settlement.







# RULES

## ARBITRATION.

I. Any dispute arising out of a contract embodying these rules shall be referred to arbitration in London, each party appointing one arbitrator, who shall be a member of the Association, or a partner in a member's firm, or a director of a company represented by a member, and such arbitrators shall have the power to appoint an umpire, who shall be a member of the Association, or a partner in a member's firm, or a director of a company represented by a member, whose decision in case of disagreement is to be final.

II. The arbitration fees to be paid by the party against whom the decision is given, except when allowances are fixed by arbitration on country damaged or on seed damaged during the voyage: in such case the fees to be equally divided, also in other cases, where, in the opinion of the referees they should be so treated. All arbitration allowances for inferior quality shall be stated in percentages and in multiples of  $\frac{1}{4}\%$  (one quarter per cent), minimum  $\frac{1}{2}\%$  (one half per cent).

III. In the event of one of the parties refusing to appoint an arbitrator, or neglecting to do so for seven days after notice in writing of such an appointment by the other (such notice to be delivered personally or left at the usual place of business of the party so omitting to appoint), or in case the arbitrators shall not within seven days after their appointment agree to an award or appoint an umpire, or in case after the appointment of such arbitrators or umpire they or he or any of them shall die, or refuse to act, or become incapable of acting, and the party or parties with whom their or his appointment originally rested shall omit to appoint a substitute within three days after notice of such death or refusal, or incapacity, then upon application by either of the disputing parties and provided the applicant at the same time pays to the Secretary of the Incorporated Oil Seed Association the sum of £2 2s. 0d., the Executive Committee shall appoint an arbitrator or arbitrators, or umpire, who shall be a member of the Association, to fill the vacancy or vacancies arising.

IV. All awards by Arbitrators or an Umpire shall be in writing on an official form issued by the Secretary of the Association and the arbitrators or umpire shall have power to award the costs of and connected with the reference, and may assess the same at a fixed sum if they or he shall think fit.

V. In case either party shall be dissatisfied with the award a right of appeal shall lie to the Committee of Appeal of The Incorporated Oil Seed Association provided it be claimed by notice given to the Secretary of the Association not later than 12 o'clock noon on the 14th day after the date of the award (Sundays and public holidays during that period not to count) and provided also that the Appellant at the same time pays to the Association as a fee for the Appeal the sums following, viz.:—If the Appellant be a member or be a firm with one partner at least who is a member of the Association £21 0s. 0d., and in any other case £26 5s. 0d.

VI. The appeal shall be determined by a Board of Appeal consisting of four members of the Committee of Appeal of the Association in accordance with the Regulations of Association for the time being of The Incorporated Oil Seed Association, and the Rules of the Executive Committee for the time being in force. No member of the Committee of Appeal who has an interest in the matter in dispute or who has acted as arbitrator or umpire in the case and no member of the same firm or company to which either of the arbitrators or the umpire shall belong shall vote on the question of the appointment of members of the Board of Appeal or shall be appointed a member of the Board of Appeal.

VII. The parties to an arbitration or an appeal to the Board of Appeal shall not be represented or appear by Counsel or Solicitor on the hearing of such arbitration or appeal unless in the sole discretion of the arbitrators, or umpire, as the case may be, or Board of Appeal, the case is of special importance or question of law are likely to arise upon which the opinion of the High Court of Justice may be required.

VIII. The Board of Appeal shall confirm the Award appealed from unless not less than three of the members of the Board of Appeal decide to vary such award. The Board of Appeal may award the payment of the costs and expenses of and incidental to the appeal but the appeal fee shall follow the award unless three of the members of the Board of Appeal shall direct otherwise. The award of the Board of Appeal whether confirming or varying the original award shall be signed by two members of the Board of Appeal and countersigned by the Secretary of the Association and when so signed shall be deemed to be the award of the Board of Appeal and of the Committee of Appeal and shall be final and conclusive in all cases.

IX. No award by arbitrators or an umpire shall be questioned or invalidated on the ground that either of the arbitrators or the umpire is or was not qualified to act as provided in Rules 1 and 3 unless objection to his acting is made in writing before the hearing of such arbitration is begun and no award of a Board of Appeal shall be questioned or invalidated on the ground of any irregularity in the election of the Board of Appeal or of any of its Members or on the ground that any Member of the Board of Appeal was not eligible to serve unless objection is made in writing and established to the satisfaction of the Board of Appeal before the hearing of the Appeal is begun.

X. Any notice may be delivered personally or left at the place where the party to whom it is to be delivered is carrying on or (by reason of the provisions of the contract) is to be considered to be carrying on business.

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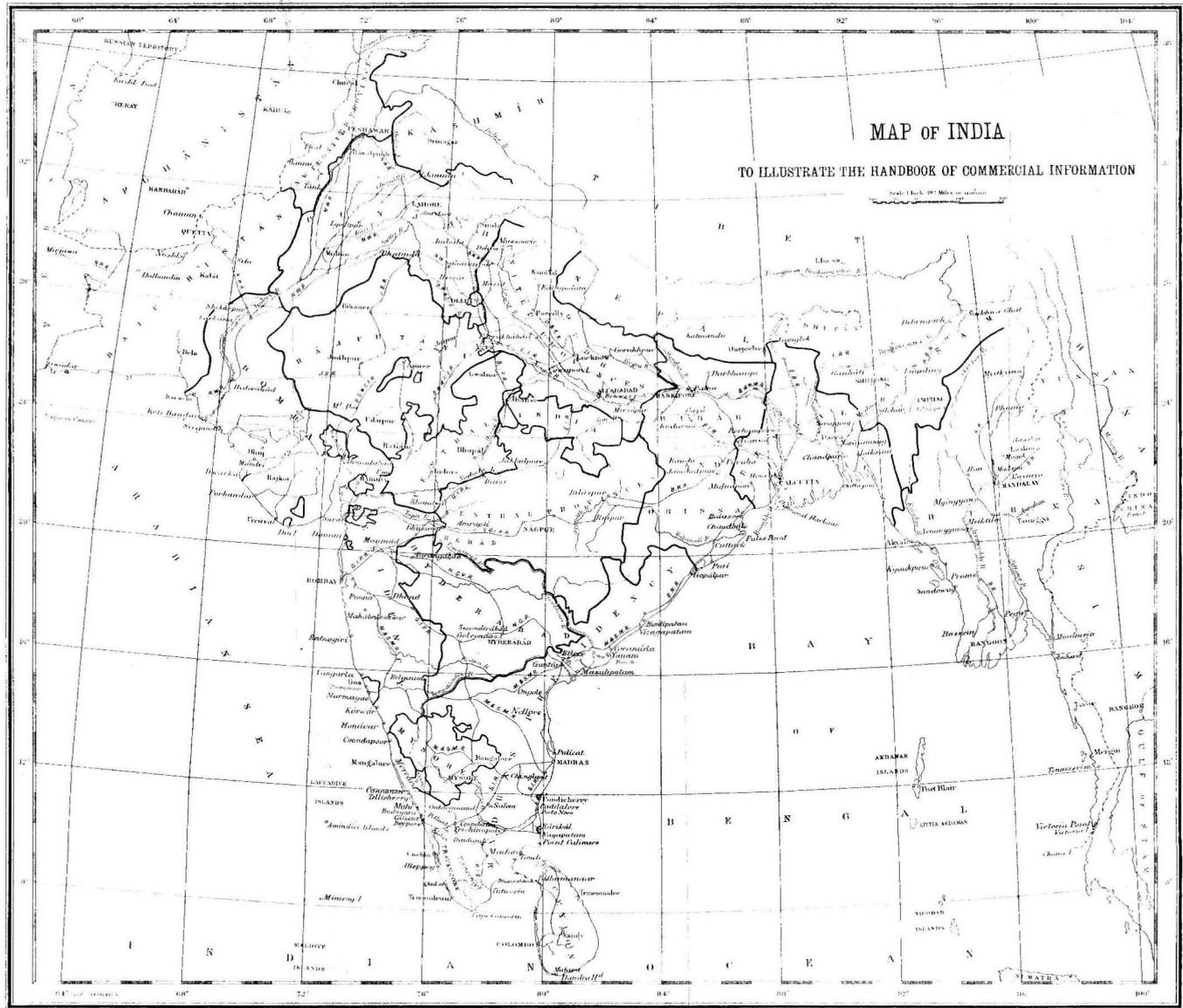
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